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38

A Compendium of Good Practices in Coastal and Marine Biodiversity Conservation in India

February 2014

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Indo-German Biodiversity Programme
Conservation and Sustainable Management of Coastal and Marine Protected Areas

CMPA Technical Report Series No. 38
A Compendium of Good Practices in Coastal and Marine Biodiversity Conservation in India

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Disclaimer

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1 Introduction

Addressing environmental and developmental issues on the coast has been a challenge for various agencies, especially the local and national government machinery. However, there have been several inspirational initiatives, efforts and programs that have tried to address these challenges at local, regional, national and perhaps international levels. Such positive efforts stem from individuals, communities, civil society, administrators, media, industry etc. Gaining knowledge and learning from such initiatives – that have been tried, tested, evaluated – would be of immense value for several stakeholders on the coast as well as coastal managers. Sharing such initiatives also helps in strengthening sustainability education for all; learning's for quality governance and developing integrated coastal zone management interventions.

The subject of coastal and marine protected areas is relatively new. It is also a vast as stakeholders involved are spread in different sectors and geographical levels. In order to discuss any conservation strategy, it is therefore important to have a complete picture of the existing success and failure stories.

It is in this background that Centre for Environment Education (CEE) with support from *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH undertook a project to capture important, significant and valuable good practices from the coastal and marine areas in India. The project emerges from the need to compile information on such good practices at one place in a manner that it can be used for planning and implementing potentially successful strategies on coastal and marine protected areas.

2 Objective

The objective of the consultancy was to develop a report of case studies on good practices, including strategies, activities and documentation, on coastal and marine biodiversity management.

3 Project Implementation

i. Deskwork Review and Workshop to identify 50 case studies

As per the work plan, CEE initially prepared criteria for selection of cases and identified over 100 case listings from different coastal districts across India based on deskwork review. Later around 50 to 55 cases were shortlisted during a joint workshop of CEE and GIZ organized on 1st October, 2013 at Ahmedabad. During the workshop, a screening criteria was developed and the individual state-wise case listings were reviewed in order to finally shortlist or reject them as per the criteria.

Further, Dr. Neeraj Khera from GIZ facilitated a discussion on the format of the case study presentation. The idea was to try to document case studies in similar fashion to keep uniformity and serve the project purpose. The cases could also be shortlisted considering the feasibility and scope for documenting the information /process as per the presentation format. The next process was to document the shortlisted cases based on field verification, field observations, meetings and secondary information. The list of participant of the workshop is mentioned below:

No.	Name of participant	Email id
1.	Dr.Jan Michael Vakily, GIZ	michael.vakily@giz.de
2.	Dr.(Ms.) Neeraj Khera, GIZ	neeraj.khera@giz.de
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10.	Ms. Hiral Pandya, CEE Ahmedabad	hiral.pandya@ceeindia.org
11.	Mr. Sujeet Dongre, CEE Goa	sujeet.dongre@ceeindia.org
12.	Dr. Shriji Kurup, CEE Tamil Nadu	shriji.kurup@ceeindia.org
13.	Ms. Vanitha Kommu, CEE Andhra Pradesh	vanitha.kommu@ceeindia.org
14.	Ms. Prarthana Borah, CEE Delhi	prarthana.borah@ceeindia.org

The detailed workshop report, screening criteria, case presentation format, participant list, list of identified cases from desk review, final shortlisted cases state wise, photographs were subsequently submitted to GIZ and shared with all the participating CEE team members. The workshop report, screening criteria and case presentation format is enclosed in the annexure for reference.

ii. Documentation of 50 shortlisted case studies

As per the original proposal, during the period from 2nd week of October, 2013 to 2nd week of November, 2013 all the 50 cases were originally proposed to be documented and submitted. However, all the cases could not be covered for verification. Meanwhile around 4 to 6 cases from different states and which followed different processes like field verification, field observation and meeting and some based on secondary information were shared with GIZ as per the case presentation format during November 2013. Based on the inputs, it was decided to extend the case study documentation work till 31st January, 2014.

iii. Results from the field documentation of cases studies

CEE State Coordinators from Gujarat, Goa, Kerala, Tamil Nadu, Andhra Pradesh, Orissa, and West Bengal were involved in coordinating the field verification and documentation work for their respective states. Each coordinator/author submitted their case studies after verification process and the same has been compiled together into a single report. The individual case studies have not been edited and information as provided by the individual authors retained to the maximum extent possible so that any further clarification, information gaps, editing, and improvements can be sought from individual authors for the corresponding cases.

The field verification basically involved making field visits, meeting some of the project stakeholders, people in the project area, meetings and discussion with the NGOs / Govt. staff associated with the identified project, secondary data collection and analysis, telephonic discussions etc. Considering that very less time was available and could be spent on field to document and study the various aspects / perspectives of a single case, the maximum effort was to verify whether the case was showing successful demonstration of results on ground, particularly from community perspective and whether results were widely accepted.

In some cases, while secondary information and reports existed on the success of the cases, upon meeting the primary stakeholder –e.g. community member associated with the project and in some cases the NGO and government staff, it was revealed that the context of the case was not related to biodiversity conservation or there were substantial gaps in verifying or compiling information as per the case study presentation format. For a few cases which were emerging from a same region or organization and showed consistency and similarities in implementation process, the cases were merged. The table below gives

details of the cases that were found to be non-verifiable or not suitable to pursue and with substantial information gaps as desired in the case presentation format.

Coordinator	State	Cases originally shortlisted but not verifiable / appropriate to pursue after field / meeting work.	Reasons for not being pursued as a case study
Ms. Janki Teli	Gujarat	1. Veraval – Mangrol fisheries management plan 2. Lobbying by NGO in Gulf of Kutch for bird - Flamingo conservation – BNHS	1. Veraval case is that of FAO supported harbour improvement project – not biodiversity related. 2. The Kutch Flamingo case study does not have elements of community participation. Its basically a legal strategy and major information gaps as per case study format.
Mr. Sujeet Kumar Dongre	Goa	1. Chorao island conservation. 2. Divar island in Mandovi estuary – Khazan conservation	1.,2. The system of Khazan land biodiversity conser-vation in Chorao and Divar has been covered under the case study of Ramponkar submitted separately.
Mr. Sujeet Kumar Dongre	Maharashtra	1.Kasav Mitra Mandli – Ratnagiri turtle conservation efforts 2. Dahanu Coastal Tribal Tourism 3. Mahim creek mangrove nature park	1. This has been considered along with the case study on Sahayadri Nisarga Mitra (SNM) work along Maharashtra coast. 2. This has been considered under Dahanu environmental protection authority case study. 3. Malvan creek case study is a nature reserve reclaimed land and being used as a nature conservation centre. Documentation requires more time on field and extensive meetings to gather ground data related to information as per case study format.
Mr. Shriji Kurup / Mr. Sujeet Kumar Dongre	Karnataka	1. Mangalore Fisheries College – DAKSHIN fisheries case study Community Based Fish Catch Monitoring in Mangalore 2. Traditional practice of environment friendly fishing in Nethravathi estuary	1. The case is more of efforts towards community participation in scientific monitoring, not on fisheries or marine biodiversity conservation. Impact not seen to measure success. 2. Case un-verifiable. Measurable impact of traditional boat design and fishing practice on biodiversity conservation of estuarine area not very tangible. The practice is declining and modern boats are used more. Sustainable fisheries aspect can't be fully studied.
Ms. Padma G.	Kerala	1. Kuttanad coastal wetland conservation; 2. Kerala Fishers Union lobby for trawl ban; 3. Kadalkodathi System; 4. Kerala State Biodiversity Board and Marine Biodiversity Register 5.Media reporting for Perumbalam estuary conservation	1. Its a macro-scale conservation effort and less time on field to cover various aspects. 2. Historically relevant to case of fisheries management but currently there are objections on norms on trawl ban and number of days for no-fishing. Requires much time on field for discussion with trawler owners and traditional fishers. 3. Could not be verified on field with appropriate stakeholder. 4. Not tangible evidence on marine biodiversity register and involvement of community. 5. Is fully based on secondary information and doesn't have elements of information as desired in case study format. However, the case has been incorporated by clubbing events/impacts of the local community agitations for preserving Perumbalam ecology, that preceded the media reporting.
Ms. Rejini Simpson	Tamil Nadu	1. Fisher institutions for governance – Nagapattinam 2. Padu system in Pulicat 3. BEDROC - Nagapattinam Water Body reclamation 4. Gulf of Mannar - SDMRI coral research and policy inputs 5. Gulf of Mannar - impact of invasive seaweed spp. 6. Gulf of Mannar - tracking fin-fish resources – DAKSHIN 7. Integrated Mangrove Fishery Farming System in Picchavaram – MSSRF 8. Traditional craft and impacts on conservation - Ramnad coast 9. Student Sea Turtle Conservation Network lobby for turtle conservation	1. Traditional systems have broken; info from village heads differ; not verifiable 2. Padu system impact not measurable currently in terms of biodiversity conservation or natural ecosystem disturbance – case traditionally refers to conflict management and resource sharing. 3. BEDROC water body – to do with mapping exercise and cash for work; NREGA work – impact on biodiversity not measured – revived agriculture practice 4. Not verifiable on field, lack of evidence on policy inputs 5. Invasive seaweed *K. alvarezii* was being cultivated for commercial purpose; community cultivation model had been promoted by DRDA, also considered for access to benefit sharing model. DBT and District Fisheries Department have inadequate information / clarification on how this activity is biodiversity conservation and sustainable use example. 6. DAKSHIN efforts on sensitizing fisheries – landing centres on fish resources caught and commercial value; not linked to fish stock management. – case of

Coordinator	State	Cases originally shortlisted but not verifiable / appropriate to pursue after field / meeting work.	Reasons for not being pursued as a case study
			participatory engagement of community in monitoring studies. 7. No scaling up/ monitoring after study in the field 8. Details not available. Extension person from Agri and Fisheries Department cannot recollect the study. 9. The case history, process, discussion with NGO has been completed and documented. But evidence of its impact on turtles re-nesting in the areas from where casuarinas plantations were removed due to the lobby is not available or verifiable. Therefore, case study put on hold. Case is widely reported otherwise on internet.
Ms. Vanitha Kommu / Ms. Indira Prakash	Andhra Pradesh	1. Community based management system for sustainable fisheries – Godavari	1. non-verifiable on ground
Ms. Reema Banerjee	West Bengal	1. Govindpur Abas island climate change adaptation 2. Dept. of Forest, West Bengal effort for conserving mangrove systems in Sundarbans through alternate livelihood – MFF report	1. Not-verifiable on field. Person in the case does not relate her efforts to the biodiversity focus as stated. Better cases of individual efforts available. MS Chandrani Das, Project Coordinator, Development Research Communication and Services Centre (DRCSC) has been contacted for the same and cases studies of DRCSC submitted. 2. Not-verifiable on field. Forest Dept. can't recollect this case. The present DFO of the region Ms Lipika Ray had been contacted for the same.
Mr. Shriji Kurup	Lakshadweep	1. Traditional institutional knowledge - Amin and biodiversity games by children	1. Non-verifiable, secondary details unavailable, impact not measurable
Mr. Shriji Kurup	Andaman & Nicobar	1. Nature Conservation Foundation, Mysore – effort for Dugong studies 2.Monitoring and conservation of leatherback turtles and their habi-tats in the Andaman and Nicobar Islands – DAKSHIN Foundation 3. Interventions for marine conservation education in formal school systems	1. not-verifiable. It is a research study. No community involvement. 2. As per discussions with DAKSHIN – this is a research study and restricted to tagging and tracking turtle movement. Direct linkages with turtle conservation, improvement in impact – absent. 3. It is a school environmental awareness program – measurable conservation impact and community participation in conservation absent.
Mr. Shriji Kurup	Pondicherry	1. TISS, PondyCAN, Bombay Natural History Society work on GIS database for coastal biodiversity conservation.	1. Case relates to civil society working to map coastal developmental issues/ sites along coast of India. Pondicherry case is on coastal erosion. Direct focus on biodiversity is low and more on coastal infrastructure and developmental projects – like ports, sea walls, tourism etc. Gives macro status of national coastal scenario. Not relevant to case study format where efforts on successful conservation outcomes expected.

The details of the corresponding authors/coordinators are mentioned below:

State wise case study	Contact details of corresponding author/coordinator for more information
Case studies from Gujarat	Ms.Janki Teli, CEE Ahmedabad, janki.teli@ceeindia.org; +919879766672
Case studies from Goa & Maharashtra	Mr.Sujeet Kumar Dongre, CEE Goa, sujeet.dongre@ceeindia.org; +919422063917
Cases from Karnataka, Pondicherry, Andaman, Laskhadweep	Mr.Shriji Kurup, CEE Chennai, shriji.kurup@ceeindia.org; +919442541513
Cases from Kerala	Ms.Padma G., CEE Kannur; padma.g@ceeindia.org ;+919995882399
Cases from Tamil Nadu	Ms.Rejini Simpson, CEE Tamil Nadu; s.rejini@ceeindia.org; +919003240690
Cases from Andhra Pradesh	Ms.Vanitha Kommu; CEE AP; vanitha.kommu@ceeindia.org; and Ms.Indira Prakash – CEE AP; indira.prakash@ceeindia.org; +919440407559
Cases from West Bengal	Ms.Reema Banerjee, CEE West Bengal; reema.banerjee@ceeindia.org; +919748032777

Annexures

1. Short-listing case-study workshop report;
2. Screening criteria – one-page note;
3. Case presentation format.

4 Presentation of case studies

GUJARAT

1. Role of Pagadiya in demonstrating sustainable fish harvest and influencing policy for conserving intertidal marine biodiversity in Gulf of Kutch.

Background of the study

The case reveals how *Pagadiya* (traditional migrant fishers utilizing intertidal area for fishing) contribute traditionally to conservation and sustainable use of marine resources in Gulf of Kachchh. However, the establishment of infrastructure like the power plants and ports in the Mundra region has disturbed the intertidal ecology thereby threatening the livelihood of *Pagadiya* and also the marine biodiversity. In this situation, a local community based organization (CBO) called the Macchimaar Adhikar Sanrakshan Samiti (MASS) made critical interventions to document and communicate the biodiversity loss due to Port and industrial activities in the Mundra coast. Their efforts helped in highlighting the role of the *Pagadiya* in contributing to the local fisheries economy and engaging them to dialogue with the local administration and policy makers, including the legal fraternity to draw attention of the Ministry of Environment, Forest, and Climate Change (MoEFCC), other NGOs and National Green Tribunal to regulate more strictly the environmental compliance of the industries and protect the biodiversity of the Gulf of Kutch – Mundra coast – which is a critically vulnerable coastal area (CVCA) as per the CRZ 2011 Notification.

Title: Role of *Pagadiya* in demonstrating sustainable fish harvest and influencing policy for conserving intertidal marine biodiversity in Gulf of Kutch.

Author(s): Ms. Janki Teli, CEE; Mr. Bharat Patel (MASS)

Name of the State and study Location: Bhadreshwar village, Mundra Taluk, Kutch district, Gujarat

Objective of the initiative/ project:

Protection of the intertidal ecology and marine biodiversity of the Mundra coast which is the traditional fishing ground of the *Pagadiya* and thereby protecting their livelihoods.

Implementers: Local Pagadiya fisher folk and local NGOs - Macchimaar Adhikar Sanrakshan Samiti (MASS)

Dates: 2006 onwards

1. Background information

Pagadiya fishing is traditional non-mechanized fishing specific to Gulf of Kutch coast (or probably Gujarat); and utilizing the wide intertidal shelf and large tidal amplitude peculiar to the Gulf. Pagadiya fishers venture into the intertidal area during low tide, usually a little ahead of the waves, where the water level is low. They place their nets on sticks planted into the mud. As the water comes in during high tide, the water covers their nets and brings fish from the Gulf of Kutch to this inter tidal zone to feed. When the water recedes during low tide, the fish that have swum into inter-tidal zone to feed get caught in these nets. Pagadiya wade into the water in the next low tide and collect the fish caught. The hodi (plank-built boat) or a mule/horse cart is used to transport the catch. Non-mechanized fishing craft like the machwa or the sailboat and gillnets and bag-nets are also used by them to catch fish. The mesh size of the net is such that the small fish and the fish fingerlings pass through the net.

Thus the entire population of fish in not caught and some reproductive stock of fish is always left behind to fish in the next season. Some fishermen also use other techniques like putting up the net in a “V” shape, with the mouth of the “V” towards the landward side, to ensure that only large fish are caught (*Ref. Personal Conversation with fishermen of Bhadreshwar Bandar*). They fish for about only 8 to 9 months in year. This traditional fishing method presents a case of sustainable use of marine resources in the intertidal region and application of knowledge of tides, intertidal shelf etc. to catch fish – without any technology or modern fishing tools. This method is major livelihood source for un-organized fishers, subsistence and the poorest community members. It offers work to men, women and children. Often, these Pagadiyas migrate and time their operations with season. They occupy temporary sites (like Bhadreshwar coast) where they set up temporary settlements with houses made from gunny bags and plastic and use the open spaces available to dry the fish catch. The Pagadiya fishermen contribute to bio-diversity conservation and sustainable use of resources by just following their traditions.

2. Origin of the problem

The rapid and unplanned industrialisation along the Mundra coast (where majority of the *Pagadiya* earn their livelihood) has led to habitat change, biodiversity loss, particularly due to establishment of large number of desalination plants, power plants and port infrastructure. This resulted in rare fish varieties like Hilsa, migrate to other regions. Another major natural disaster was cutting of mangroves of about 3000 hectares, which has increased salinity manifold, further degrading the ecology and land of the region.

The negative effects of the unplanned industrialization of the Mundra coast were felt by the *Pagadiya* from the year 2003-04 onwards. The fish catch per day for Pagadiya fishermen (one without boats) was about 40-50 kg. per day, which fell to about 30 kg. per day in that period. Currently, it is below 15 kg per day. The women who are involved in fish marketing and sales reported reduction in their income by 50% - overall loss of Rs.2000-2500/- on a monthly basis. The *Pagadiyas* then started shifting away from their traditional fishing activity and taking up labour work for packaging dry fish and construction work. However, the incomes are still, not in the range of what they used to get earlier. Moreover, they also felt a loss of dignity of work and losing their traditional rights, work space and autonomy.

The *Pagadiyas* also reported incidences of deteriorating health and increase in skin diseases due to the industrial air and water pollution and increased salinity in the ground water of the Mundra coast. High incidents of kidney stones were reported in majority of the families.

3. Process of implementation

The Machchimar Adikar Sanrankshan Samiti (MASS) which is a local CBO established for protection of fishermen rights in Mundra coast along with SETU (an initiative of Kachchh Navnirman Abiyan (KNA) for Gujarat Earthquake Rehabilitation) intervened to protect the livelihood of these Pagadiya fishermen and thus protect the marine biodiversity and restore fish stock in the intertidal region along the Mundra Coast.

Before the intervention of MASS, the SETU unit of Bhadreshwar village started working with the fishing community in partnership with Ujjas Mahila Sangathan (UMS), YMC (Yusuf Meherally Centre), CARE and later on with NFT (National Fisheries Trust). Their initial efforts focused on strengthening Local Self-Governance via Coastal Panchayats. The implementing organizations realized that these Coastal Panchayats act as first line of leadership and are accountable to the community for addressing their issues.

SETU focused on capacity building on leadership skills to address rights and development issues of fishing community. Trainings on Health, Education, Human Rights, Shelter, Livelihood, Coastal Regulatory Zone and Special Economic Zone related issues were given to the community members and Panchayat leaders. Participation was ensured from both men and women of the villages. Through these trainings and intensive dialogues, the Coastal Panchayats passed a resolution that four of the eight settlements along the Mundra coast were declared as the fish catching cum landing centres.

All the Coastal Panchayats were organized into an Apex Panchayat. The Apex Panchayat comprising of 50 members met regularly every month to discuss the problems of settlements. They started advocating the social-environmental issues with higher and relevant authorities.

An Information Kiosk was set up in Bhadreshwar for the fishermen to provide services related to:

i. e- Governance services:
Government scheme forms; Government certificate facilitation; Application writing; Computer Education; . Government Department Information; General Information about whom to contact and where to go to avail government services; BPL Information

ii. Development related Services: Computer education; Job work; Loan Information; Market linkages; Non-Government organization schemes; Law and legal guide

iii. Creation of Enabling environment: Photo copy, Photographs, Internet browsing, Phone facilities, Scanning and Printing

The above set of implementation activities, helped in creatively engaging the local community, particularly the *Pagadiyas* in voicing their concerns and capacity building themselves on important skills and knowledge to influence the local administration and policy makers, basically to draw attention to the biodiversity loss and pollution in the Mundra coast and impact on their livelihoods. The establishment of the Macchimaar Adhikar Sanrakshan Samiti (MASS) was a result of their united voices finding ways of organizing and structuring themselves in order to represent themselves better and channelize their combined energies for seeking justice and protection of their traditional livelihoods.

4. Outputs and Outcomes

a. **Removing the threat of getting evicted and arriving at a rehabilitation plan**
The efforts by SETU Bhadreshwar and MASS helped in highlighting the actual negative impact of the industrial activity in Mundra coast and how much the local traditional fishers were contributing to the local economy. Nearly 9500 fisher men and women were prevented from shifting their occupation and traditional fishing grounds. Proper legal representation at the local level to the central level – e.g. dialogues and representations with the Ministry of Environment, Forest, and Climate Change (MoEFCC) and National Green Tribunal helped the *Pagadiya* and local fisher community to seek justice and ensure that adequate directives were given by the MoEF to the industrial groups at Mundra to comply strictly with environmental norms and give compensation to the affected families. Accordingly, the fishers could retain their fishing space and also prepare a rehabilitation plan which could be supported by the companies.

b. **Protecting the marine ecology**
In 1998 when Mundra Port was setup, rampant destruction of Mangroves took place. The mangrove cover got reduced from 600 hectares in 1998 to 340 hectares in 1999. The destruction of the mangroves was documented by the MASS and local community and communicated with the MoEFCC officials during the CRZ Public consultation meeting and also through separate representations made through the National Fish Workers Forum (NFF). This ensured that the remaining mangroves and creek areas along the Mundra coast were protected and the responsible companies penalized.

c. **Capacity building for better livelihood and socio-economic benefit**
Through the interventions by MFF and SETU Bhadreshwar, the local fisher community could organize themselves into Self Help Groups and CBOs with adequate leadership skills to take local decisions on development planning and restore their traditional fishing practices. Socio-economic benefits of the MASS and SETU initiative included, higher literacy rates, participation by both women and men, articulation and communication of their concerns to the higher authorities, legal representation, knowledge about legal compliance norms, alternate livelihood options, government schemes etc. Overall helped in improving the socio-economic status while restoring the fishing grounds, intertidal marine biodiversity inspite of pressures from the industrial growth. To an extent, the industries were also sensitized to the fishers need and found more acceptance of their concerns and support for their rehabilitation. Better management of fish marketing and

proper loan facilities have helped several families to overcome debt related problems and group themselves for entrepreneurial work.

d. **Proposal for an ecologically sensitive area demarcation**
MASS along with SETU and Kachchh Navnirman Abhiyaan has documented extensively the traditional fishing grounds and Pagadiya livelihood cycles. Accordingly, they have demarcated an Ecologically Sensitive Area along the Mundra coast for the protection of biodiversity as well as for the protection of the coastline as well as pagadiya fishermen. The proposed ESA falls in Mundra and Anjar Taluka of Kutch district in Gujarat. It is a long stretch along the sea from Luni to Tuna. The region lies between latitudes 22º47'55.54"and 22º53'38.85"N and longitudes 69º48'29.82" and 70º10'12.51"E. Total area of the proposed region is 292 km2, out of which a total of 173 km2 of land area is there. The status of Ecologically Sensitive Area for the Mundra coast will safeguard the region against the negative impacts of rapid industrial activities.

Map: area demarcated along the Mundra coast – suggested as ESA

5. Discussion

The project initiative by MASS, SETU Bhadreshwar and the NGOs in the Mundra coast is now widely recognized as being able to provide guidance and framework for the local fishers and panchayats to unite and channelize their efforts and energies for the protection of the coastal and marine biodiversity along the Mundra coast, including the protection of the livelihood of thousands of traditional fishers. The important point is that sustaining people's movement and providing legal voice and representation is a key element of success for communities, especially if they are fighting for their rights against powerful industrial lobbies. A sensitive government machinery and media also helps in highlighting the local issues adequately and being addressed appropriately. The commitment of the local staff of NGOs, participation of key community leaders are crucial towards facilitating divergent opinions amongst the community and channelize their opinions constructively and not let it fall apart. The parallel intervention of providing capacity building for livelihood skills, literacy, leadership skills, legal support etc. help in overall socio-economic upliftment, with local community gaining confidence in themselves to influence policy makers and key administrators towards taking decisions that are useful for conservation of local biodiversity, their livelihoods and better environmental compliance norms and monitoring mechanisms by the industries. Often a confrontationist approach towards livelihood and biodiversity protection has to be taken, because legal norms are by passed – violated and the guilty not penalized. Marine biodiversity conservation in the Gulf of Kutch has to be made more effective by demarcating Ecologically Sensitive Areas (ESAs) and Critically Vulnerable Coastal Areas (CVCAs) so that industrial establishment do not choose such sites for their project locations.

References:

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http://carbonmarketwatch.org/wp-content/uploads/2013/03/Ahmedabad-CDM-Bharat-Patel.pdf

http://aquaticcommons.org/2077/1/Kutch.pdf

Field visit to Bhadreshwar village and meeting with fishers. Meeting and discussion with Mr. Bharat Patel, secretary, MASS, Bhadreshwar.

Contact: Mr. Bharat Patel, Machimar Adhikar Sangharsh Samiti (MASS), Bhadreshwar Ta., Mundra, Gujarat – 370 411 Email: mass.kutch@gmail.com**; +91-9426469803**

2. Campaigning to the save the Whale Shark along the coastline of Gujarat

Wildlife Trust of India's (WTI) whale shark campaign in 2004 called "Vali" – motivated fishers across the Saurashtra-Veraval-Jamnagar coast for protecting Whale Sharks; stop illegal hunting; finning and illegal trade practices. The campaign influenced the Government of Gujarat to adopt the Whale Shark as its mascot and being able to effectively conserve the Whale Sharks along the Gujarat coast.

Title: Campaigning to the save the Whale Shark along the coastline of Gujarat

Author(s): Ms.Janki Teli (CEE)

Name of the State and study Location: Gujarat – Study location – Gujarat Coast

Objective of the initiative/ project: To protect the illegal hunting of Whale Sharks through effective public awareness campaign

Implementers: Wildlife Trust of India (WTI), Tata Chemical Limited (TCL), International Fund for Animal Welfare (IFAW) and Gujarat State Forest Department.

Dates: 2004 -2008

1. Background information

Gujarat coast is host to the largest fish in the world – The Whale Shark which migrates from Australia and South East Asia. This fish visits the coast of Gujarat to breed. In 2001 Mr. Mike Pandey's film "Shores of Silence bought to light the fact that whale sharks we killed in large numbers along the coast of Gujarat, mainly because to harvest their livers which were used for waterproofing the fishing boats. These whale sharks were not protected since a lot about them was still unknown. WTI along with Mike Pandey subsequently lobbied with the MoEFCC for the whale shark to be brought under the Schedule I of the Wildlife (Protection) Act of India in 2001—the highest level of protection to a species. In the year 2002 due to the efforts by India and Philippines, the fish was included in Appendix II of the CITES (Convention on International Trade in Endangered Species). A campaign to save the whale shark was thus launched in 2004 to build awareness on its protected status and illegal killings among the local fishing community in order to stop the killings and to urge the general public of Gujarat to protect it. The Save the Whale Shark Campaign was launched as a

multi-pronged campaign with support from two corporate houses in Gujarat that had manufacturing units on the coast. The campaign adopted a strategy of soliciting the support of a popular religious leader –Morari Bapu, who equated the fish to an incarnation of a Hindu deity and accorded it a status of a beloved daughter coming home. A life-sized inflatable model, a street play in the local language, theme-based painting competitions in schools, fetes with the whale shark conservation theme, an educational film and public events all worked together to take the campaign from an awareness campaign to a Pride campaign. A series of adoptions of the whale shark as the city mascot by municipal corporations saw the involvement of decision makers and government bodies. Awareness among the fishing community built up to a level where hunters turned protectors and instances were recorded where fishermen cut their fishing nets to release trapped whale sharks.

2. General description of project / initiative / effort

Purpose / objectives:

- Conservation of Whale Shark
- Awareness Campaign regarding conservation of whale shark among coastal as well mainland communities

Implementing entity / partners

Wildlife Trust of India (WTI), Tata Chemical Limited (TCL), International Fund for Animal Welfare (IFAW) and Gujarat State Forest Department

Project / initiative duration

Phase I: 2004 -2008 Phase II 2008 onwards

3. Process of implementation

The fishing community was involved in the process through a mass awareness campaign with the help of local religious leader preaching regarding Save the Whale Shark. Both the quantitative and qualitative analysis was carried out as baseline survey to get an understanding of the awareness levels of whale shark amongst citizens both urban and coastal. The survey was carried out in three levels Children (8 -14 year of age), Young adults (15-24 years) and Adults (24 -55 years). Amongst the fishermen, Boat / Trawler Owners, Fishermen and Labourers who cut / clean the fish were all surveyed to get an overview of their understanding / awareness of whale shark. This initial survey revealed that citizens of Gujarat State had limited knowledge of fundamental aspects of the whale shark, calling for a vigorous campaign.

The baseline survey revealed that a multi-pronged campaign aimed at generating pride among the inland urban centres regarding whale shark – the world biggest fish, building awareness on the protected status of the shark and ban on hunting among coastal fishing communities would be effective. The pre campaign visits revealed that most of the fishermen along the coast of veraval – mangrol were Kolis and Kharwas who were non-Muslims. Thus it was decided to involve a Hindu religious leader, saint, preacher, and social reformer – Shri Morari Bapu to campaign for the conservation of these species. Shree Morari Bapu with over more than 600 kathas (religious discourses) to his credit on Lord Rama, Krishna and the Scriptures championed the cause of conservation of the Whale Shark in his own inimitable style. This evoked great media interest, and made people sit up take notice when he talked about saving the Whale Shark. Two corporate houses Tata Chemical Limited and Gujarat Heavy Metals Limited funded the campaign. TCL also got completely involved in providing manpower, money and logistical support to conduct the campaign.

Various tools like a series of painting competitions amongst the children on the theme of SAVE the WHALE SHARK, was conducted after disseminating information in schools on the species and need for its protection. A street play in Gujarati, was scripted with the message of Morari Bapu forming the basic storyline of the play. Morari Bapu compared the Whale Share to “Vhali” (beloved) here in the context of beloved daughter who comes to parents’ place to deliver a child. He said when a daughter comes to her parent’s place to deliver a child, she is given utmost care. Similarly, Whale Shark comes to the coast to give birth to the children, hence she is like the daughter who has come to her parents place for childbirth and utmost care should be given to her and she should be protected and not

hunted. This message created a huge impact on the local fishermen and instead of hunting they started protecting this endangered species.

To reach out to the masses and connect them with the whale shark, a 40ft life size inflatable model that looked exactly like a whale shark, in form feature, colour shape and size was ordered to be fabricated. This model was used as backdrop for street play in various locations and it drew huge crowds. This inflatable model turned out to be a huge success in reaching out to the masses and passing on the message of whale shark conservation.

While the campaign by a religious leader, the inflatable whale shark and other community awareness programs succeeded in most places, in some places like Rupen they did not go down well and drew mixed responses. The fisheries department thought that the message conveyed by the street play may not have been in the interest of the fishermen as it would affect their livelihood. The ban on whale shark fisheries had affected the fishing community because whale shark used to fetch them a lot of money. Fishermen to save the whale shark at times had to incur losses up to Rs. 40,000/ because they had to cut the nets completely to save this gigantic fish. At times small boats got damaged due the sheer size of this gigantic fish, but the impending penalty made the fishermen incur losses and fishing community was not conserving the species voluntarily.

The whale shark has been adopted by many cities as the city's mascot, including Porbandar, Diu, Ahmedabad etc. This was just the raise awareness amongst one and all regarding the importance of this endangered species

After the campaign the first fisherman who cut his net to save the whale shark was honoured publicly by Shri Morari Bapu in one of his kathas. Tata Chemicals Limited also rewarded some fishermen with cash prizes as compensation for cutting their nets and saving the whale shark.

Altough the fishermen were motivated enough to cut the nets and suffer monetary loss incurred in releasing the trapped fish, the lure of easy cash in poaching could be deterrent in whale shark conservation. Thus a proposal for compensating the fishermen whose livelihood depended on their nets was forwarded by the Forest Department in May 2006 and accepted by the Government in December 2006. A compensation of Rs. 25,000 has been fixed for each fishing net that was damaged while saving the whale shark.

4. Outputs and Outcomes

The campaign has produced the following impacts:

- Whale Shark hunting completely stopped along the Gujarat coast
- The fisher community has accepted the importance of conserving Whale Sharks and how their efforts towards its conservation are valued by society, government and religious leaders. They feel valued and therefore motivated to continue conserving Whale Sharks, even though this may be an income loss for them.
- Government has become highly sensitized to fishers needs and proactive to adopt novel techniques of campaigning by adopting Whale Shark mascots along the coastal districts and providing full support to the NGOs and environmentalists campaign movement.
- Religious leaders have been able to influence the citizens to draw their attention to Whale Shark conservation and use the positive emotions, faith towards protecting marine biodiversity and wildlife.
- Demonstration about the behaviour and characteristics of the Whale Shark through life-size models helped in drawing mass attention to unique features of marine life and perceiving connection of humans and impact on whale sharks. Such models had huge impact in communicating the conservation message and having a multiplier effect. This was an innovative part of the campaign.
- Media coverage could be drawn towards marine biodiversity conservation and other issues of the fishers, which also helped in creating debates across various levels of the society and therefore generate more public interest and engagement for conservation issues.

5. Discussion

The campaign worked effectively due to initial ground survey and assessment of perception of various stakeholders, particularly fishers towards the whale shark conservation and other marine biodiversity

utilization issues. This helped to segregate stakeholders and bring out customized messages that were relevant to the specific coastal area and stakeholder. A key triggering factor for the success was the involvement of the religious leaders to talk about whale shark conservation. This immensely attracted mass attention and channelized their good faith towards conservation efforts. The Government also was a key actor towards the campaigns success, particularly in announcing compensation packages for fishers who lost nets while saving whale sharks and valuing fishers efforts by publicly acknowledging their efforts and rewarding them for it. This increased confidence amongst the fishers and the perceived their efforts for the larger good of the society and whale shark. The positive response of the citizens from the society in valuing fishers as important part of their society and particularly for conservation of whale shark, helped create mass positive ambience and good will for whale shark conservation. This is important to sustain the campaign movement and not depend only on legal provisions to enforce conservation laws. The entire campaign was successful as it could sustain the motivation of citizens to volunteer actively and debate on whale shark conservation. The public attention and keeping the topic under constant debate in the media was instrumental in strengthening the fishers and government efforts towards the whale shark conservation.

6. Recommendations / Conclusions

The support and physical presence of the revered spiritual leader Shri Morari Bapu, proved to be most effective in catalysing media hits and bringing the stakeholders community state government officials and enforcement agencies under a common umbrella, all working towards the cause of saving the whale shark. Considering the large faith following of several religious leaders in India and along the coast, it may be a good strategy to involve religious leaders in marine biodiversity conservation and campaigns.

References:

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3. Mangroves as bio-shield for protecting shorelines in the Gulf of Khambhat – the corporate learnings

Author(s): Ms. Janki Teli, CEE

Name of the State and study Location: Gujarat – Study location – Dandhar and Hazira

Objective of the initiative/ project:

1. To protect the shoreline erosion along Dhandhar region of Gulf of Khambhat

2. Involvement of Local Community in plantation and nursery activities

3. To create awareness and educate the local community regarding the importance of mangroves.

Implementers: BNHS – ONGC (funders)

Dates: 2007 to 2010 Phase I and Phase II 2011 to 2015

1. Background information

In case of ONGC-Gandhar site it was observed that shore erosion problem is quite acute and if timely actions are not taken, it will force closure of some of the oil wells due to erosion causing severe economic losses. In order to get a viable solution to this problem it was then decided that along with other structural measures large scale mangrove plantation can be undertaken to stabilize the shoreline which will act as natural barrier in longer run and will subsequently reduce the effect of

erosion. The plantation in itself cannot solve the problem unless local community is educated through spreading awareness about the importance of mangrove ecosystem and their different roles that they play. It was decided that the project will have two important components.

1. Large scale Mangrove Plantation at ONGC Gandhar region

2. Mobile Education Unit operational in Gujarat and Maharashtra

Mangrove plantation over time can help reduce shoreline erosion along with other remedial measures. In case of plantation a totally new ecosystem will be formed which will develop slowly but over a period of 8-10 years it will turn into mangrove forest which will help bind the soil effectively and minimize the erosion. Similarly, over a period of time the other aspect of the project "Conservation Education" will develop capacities of local communities, teachers, students and general public to motivate them towards mangrove conservation. The mobile education unit was also aimed to create a platform for likeminded corporate, to undertake mangrove plantation and to foster awareness about mangrove, mudflats and biodiversity in the region.

2. General description of project / initiative / effort

- Purpose / objectives

The area near Gandhar in Gulf of Khambhat is the major Oil field of ONGC in the western basin. Its proximity to high erosion prone Dhadhar River, pose great risk of submergence of oil wells thus not only threatening ecology but also affecting local populations. Thus shore stabilization is of prime importance to protect the coastal assets of ONGC. Dandhar, has 1470 ha. of mudflats under mangrove and another 3730 ha. of mudflats have potential to restore mangrove (Singh. H.S., 2000). Thus BNHS with support from ONGC has taken up mangrove afforestation programme in 2007.

Project Mangrove was initiated in year 2007 by ONGC& BNHS at Gujarat and Maharashtra. The long-term aim is to stabilize shore line close to ONGC assets through afforestation compounded with community awareness.

- Implementing entity / partners

The project was implemented by BNHS involving local community of five neighbouring villages

- Project / initiative duration

The initial duration of the project was three years, which has been then further extended for five more years

3. Process of implementation

- Actors: Who is involved in the process – ONGC, BNHS and local community residing along the Dandhar coast – Dendva, Valipur, Mangrol and Gandhar

- Tools: What implementation tools/ techniques have been used? Offshore Nursery Development, Mangrove plantation using wooden sticks for support of mangroves to attain a certain height, mobile education along the coastal communities in the region so as to spread awareness.

- How the participatory approach used? What communities were involved in the process? In what ways? Community were involved at each and every stage of plantation in the first phase and also in project planning in the second phase.

- How are communities affected by the initiative (positively/negatively)? Communities have been affected positively, they have now started generating revenue by developing nursery and sale of saplings and seedlings. The trained labourers also got employment in the social forestry sector.

- Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved? No controversies were generated.

- What particular success/ difficulties did the implementation met with? Initially when the project was started, only one village community was involved and this did not go well with the other village communities. Finally, a joint meeting with all the sarpanches of the nearby villages was held and jointly all the villagers were involved at some or the other stage of the project implementation.

4. Outputs and Outcomes

1. 17,85,250 mangrove plants, propagules and seeds planted and surviving in appx 100 hect area.
2. Three large nurseries were developed at GGS VI, Denva and Valipur holding a stock of 5,00,000 saplings
3. *Rhizophora mucronata* was successfully planted at Gandhar
4. Two mobile education units developed
5. 60,000 students and 1500 teachers participated in over 1000 various education activities in Maharashtra and Gujarat coastal areas.
6. 10 wetland clubs were established
7. Special wallpaper entitled 'Wetlands" was started exclusively for the wetland clubs which has a membership of 900 students
8. 250 coastal villages covered under community education and socio-economic survey. 20,000 local community members, mainly fisherman and women participated in community awareness programmes
9. Project has provided employment to 150 local community members in Gandhar region
10. Two documentaries are developed towards mangrove awareness.

What was achieved (or not) in practical terms, with regard to the following:

1. biodiversity conservation: - Biodiversity conservation achieved
2. livelihood security and sustainability: Could generate livelihood opportunities for the locals as well as the trained labourers are now employed by the forest department for social forestry activities

5. Discussion

Involvement of the locals worked very well and the community got a sense of ownership.

Plantation of other species did not work out well (*Rhizophora mucronata and Ceriops tagal*) because they require good amount of tidal inundation which this area did not have. Involvement to local community is key factor in sustaining the areas planted and they will require some protection

References:

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MAHARASHTRA

4. Community led sea turtle conservation: Effort of Sahyadri Nisarga Mitra, Chiplun.

Olive Ridley (*Lepidochelys olivacea*) in Velas, a tiny village on northernmost boundary of district Ratnagiri. In the first year Sahyadri Nisarga Mitra (SNM) undertook protection work in one village and successfully protected 50 nests. Within a short span of time SNM spread the protection work to entire coast of Maharashtra state, that's about 720 km of coastline in all. In the fourth year of the project SNM arranged protection work in 15 villages, but found only 36 nests against 50 in a village. SNM is trying its level best to overcome this problem with its limited resources and successfully released total of 7,610 hatchlings within four years. SNM through the involvement of local community, could succeed in protecting the sea turtles. To support the income, SNM started organising sea turtle festival in Velas from 2008. The festival has become successful event and locals are getting good income out of this. This has indeed given a good impetus for the locals to protect the sea turtles. SNM now has extended its turtle conservation throughout the coast of Maharashtra. SNM has now undertaken projects to protect vulture in Western Ghats region of Maharashtra

Title: Community lead sea turtle conservation: Effort of Sahyadri Nisarga Mitra, Chiplun.

Author(s): Mr. Sujeetkumar M. Dongre, CEE

Name of the State and study Location: Chiplun, Ratnagiri, Maharashtra

Objective of the initiative/ project:

1. **Community involvement in sea turtle conservation in Velas and now across the coast of Maharashtra**
2. **Education and awareness activity to protect sea turtles**
3. **Organising sea turtle festivals to support locals**
4. **Biodiversity conservation of coast and Western Ghats involving the community**

Implementers: Sahyadri Nisarga Mitra, Chiplun

Dates: 2002

1. Background information

General:

- Details on the location/ geographical dimensions: Chiplun, Ratnagiri, Maharshtra
- Kind of resource management, livelihood practices: Traditional fishery (Ramponkar), agriculture in saline reclaimed areas, and mangos in hill areas
- History: use of resources/ cultural practices / key events and projects: Chiplun, Velas is known for its fishery and traditional cuisine. Known for its traditional dance, history and unique culture.

Conditions:

- climatic, geographical, ecological, socio-economic, demographic, cultural context: Chiplun, Velas is situated on the west coast of India and falls in Western Ghats region. Ecologically, the region is rich as it harbours species which are unique to the Ghats and to that of estuary and ocean. The people of Chiplun have sufficient landholding to support their livelihood and fishing is a major activity. The population mainly consists of fishing communities, who are known for their creative songs and dances and special
- Natural hazards and recent disasters in the area: No
- Climate change vulnerability information for the area, if available: Ratnagiri is known for hub of various industries. Industry related activity could pose dangers to these areas

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area: The area is unique and rich in terms of marine and terrestrial diversity

2. General description of project / initiative / effort

- Purpose / objectives: Community involvement in sea turtle conservation,
- Project / initiative duration: Started in 2002 and continued

3. Process of implementation

- Actors: Who is involved in the process: Local community and all stakeholders
- Tools: What implementation tools/ techniques have been used? Education and awareness
- How the participatory approach used? What communities were involved in the process? In what ways? Continuous interaction with the community by organising workshops, writing in the newspapers and field visits. Development of posters, involving the forest department in identifying the nesting site and developing turtle hatchery
- How are communities affected by the initiative (positively/negatively)? Community is getting benefit out of the sea turtle festival
- Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved? NO. Since the project team was involving all the stakeholder and to study the problem related to their livelihood, community supported
- What particular success/ difficulties did the implementation met with?
    1. Development of education and awareness posters.
    2. Involvement of local community in identifying the nesting and protecting it
    3. Involvement of forest department in protecting by developing turtle hatcheries
    4. Organising yearly Sea Turtle festival

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- biodiversity conservation: Yes. The school students are involved, local community is involved, documentation has happed, forest department is supporting. GEF SGP has supported the initiative.
- livelihood security and sustainability: Sea Turtle Festival is success. Locals are getting revenue out of this activity
- Influencing policies/ decisions at a broader scale: Support is garnered from all government and international funding agencies
- Changes in the perception of local communities towards conservation (How the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?): Locals are encouraged to participate and benefit out of this activity
- Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation : Through the newspapers, issue was highlighted.
- Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation? Yes

5. Discussion

- What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.: Education, awareness, media, film screening and Sea turtle festival has helped continuation and sustenance of the project
- Sustainability: What is needed to maximize results and achieve sustainability?: Implementation of the recommendations proposed and strategy adapted
- Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?): Can be replicated. This was a collective approach of local community supported by SNM
- Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations: Supported activity
- If possible, compare to alternative solutions, i.e. the interventions without a participatory approach
- If possible, compare to similar initiatives implemented in other settings

6. Recommendations / Conclusions

Olive Ridley (*Lepidochelys olivacea*) in Velas, a tiny village on northernmost boundary of district Ratnagiri. In the first year Sahyadri Nisarga Mitra (SNM) undertook protection work in one village and successfully protected 50 nests. Within a short span of time SNM spread the protection work to entire coast of Maharashtra state, that's about 720 km of coastline in all. In the fourth year of the project SNM arranged protection work in 15 villages, but found only 36 nests against 50 in a village. SNM is trying its level best to overcome this problem with its limited resources and successfully released total of 7,610 hatchlings within four years. SNM through the involvement of local community, could succeed in protecting the sea turtles. To support the income, SNM started organising sea turtle festival in Velas from 2008. The festival has become successful event and locals are getting good income out of this. This has indeed given a good impetus for the locals to protect the sea turtles. SNM now has extended its turtle conservation throughout the coast of Maharashtra.

The Sea Turtle Festival is a great success, this can be replicated to other parts such as Malvan and Shindudurg district.

SNM has now undertaken projects to protect vulture in Western Ghats region of Maharashtra

5. Formation of Dhanu Taluka Environment Protection Authority

With the local groups in Dhanu seeking legal redress for consistent flouting of environmental laws, the Supreme Court in a landmark order, in 1996 recommended the setting up of a special Authority in "order to address the complex issues of planning and management of ecologically fragile areas". With the mandate to protect the ecologically fragile area of Dhanu taluka, specifically control pollution, consider and implement the 'Precautionary Principle' and the 'Polluter Pays' principle, the Authority was set up, headed by Justice Chandrashekhar Dharmadhikari. The Authority also has as its members, experts from the areas of hydrology, environmental engineering, urban planning, government representatives, etc.

A unique prototype of a democratic institution set up to protect the ecology, natural resources and livelihoods of a region, the Dahanu Taluka Environment Protection Authority (DTEPA) has for a period of twelve years been more than just a watchdog institution. Recognising the ecological politics of control over natural resources, the Authority has unwaveringly stood by the principles of social justice and equitable rights for local communities. With its landmark orders and judgements, the DTEPA has contributed to the environmental discourse and debate in India.

The Dhanu Authority continues to play an important role in ensuring that Dhanu Taluka becomes a model taluka of environmental protection and conservation.

Title: Formation of Dhanu Taluka Environmental Protection Authority

Author(s): Mr. Sujeetkumar M. Dongre, CEE

Name of the State and study Location: Dhanu, Maharashtra

Objective of the initiative/ project:

- Support locals on legal issues related to environment
- Frame guideline and implement them with respect to environmental issue
- People's participation in decision making

Implementers: Dhanu Taluka Environment Protection Authority

Dates: 1996

1. Background information

General:

- Details on the location/ geographical dimensions: Dhanu, Maharastra
- Kind of resource management, livelihood practices: Traditional fishery (Ramponkar), agriculture in saline reclaimed areas, and Chikoo in hill areas
- History: use of resources/ cultural practices / key events and projects: Dhanu is known for its fisher, Chickoo and industrial zones

Conditions:

- climatic, geographical, ecological, socio-economic, demographic, cultural context: Dhanu is situated on the west coast of India and falls in Western Ghats region. Ecologically, the region is rich as it harbours species which are unique to the Ghats and to that of estuary and ocean. The people of Dhanu have sufficient landholding to support their livelihood and fishing is a major activity. The population mainly consists of fishing communities also known for their creative songs and dances and special Malvani cuisine.
- Natural hazards and recent disasters in the area: No
- Climate change vulnerability information for the area, if available: Dhanu is known for hub of various industries. Industry related activity could pose angers to these areas

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area: The area is unique and rich in terms of marine and terrestrial diversity

2. General description of project / initiative / effort

- Purpose / objectives: Legal support and implementation of environmental laws,
- Project / initiative duration: Set up in the year 1996

3. Process of implementation

- Actors: Who is involved in the process: local NGO - Legal support to the locals and implementation of environmental law
- Tools: What implementation tools/ techniques have been used? Legal and environmental protection laws, awareness creation and court cases/
- How the participatory approach used? What communities were involved in the process? In what ways? Continuous interaction with the community by organising workshops, writing in the newspapers and field visits.
- How are communities affected by the initiative (positively/negatively)? Community is getting legal advice and participation of community is becoming more and more which is helping in environmental protection.

4. Outputs and Outcomes

Hon. Supreme Court, Government of India in the year 1996 ordered setting up of Dhanu Taluka Environmental Protection Authority, which is statutory in nature and provides legal advice and oversees environmental laws in Dhanu taluka

5. Discussion

- What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.: Legal advice and implementation of provision of laws related to environmental protection.
- Sustainability: What is needed to maximize results and achieve sustainability? Authority is constituted and is working
- Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?): yes
- Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations: Supported activity
- If possible, compare to alternative solutions, i.e. the interventions without a participatory approach
- If possible, compare to similar initiatives implemented in other settings

6. Recommendations / Conclusions

With the local groups in Dahanu seeking legal redress for consistent flouting of environmental laws, the Supreme Court in a landmark order, in 1996 recommended the setting up of a special Authority in "order to address the complex issues of planning and management of ecologically fragile areas". With the mandate to protect the ecologically fragile area of Dahanu taluka, specifically control pollution, consider and implement the 'Precautionary Principle' and the 'Polluter Pays' principle, the Authority was set up, headed by Justice Chandrashekhar Dharmadhikari . The Authority also has as its members, experts from the areas of hydrology, environmental engineering, urban planning, government representatives, etc.

A unique prototype of a democratic institution set up to protect the ecology, natural resources and livelihoods of a region, the Dahanu Taluka Environment Protection Authority (DTEPA) has for a period of twelve years been more than just a watchdog institution. Recognising the ecological politics of control over natural resources, the Authority has unwaveringly stood by the principles of social justice and equitable rights for local communities. With its landmark orders and judgements, the DTEPA has contributed to the environmental discourse and debate in India.

The Dahanu Authority continues to play an important role in ensuring that Dahanu Taluka becomes a model taluka of environmental protection and conservation.

6. Formation of SANGAM team towards supporting urban sustainability of Malvan, Shindudurga, Maharashtra

Malvan is known for its salt, fish, traditional dances and biodiversity rich area. Traditionally, the activity of people was fishing and agriculture. In recent times, after Shindudurg declared as a tourism district, Malvan has become very famous tourism destination. The tourism is dependent on the water sports, fishery and Malvani cuisine. Due to unplanned activities both sea ward and on the hills, the creeks are facing danger of rapid siltation. If the rate of siltation continuous, it will have negative impact on both the fishery and tourism. To understand this problem, CEE supported a project "Supporting Urban

Sustainability" in Malvan. The objective was to do a scientific inquiry of an environmental issue considering Social, environmental and economic aspect. CEE has been able to constitute a team SANGUM involving different stakeholders to study the problem of creek and come out with proper recommendations. The team did the study through a scientifically designed questionnaire, field visits and scientific literature review. The project period was for one year. Recommendations for sustainable development of creeks have been developed that supports both the fishery and tourism activity in Malvan region.

Title: Formation of SANGAM team towards supporting urban sustainability of Malvan, Shindudurga, Maharashtra

Author(s): Mr. Sujeetkumar M. Dongre, CEE

Name of the State and study Location: Malvan, Shindudurga, Maharashtra

Objective of the initiative/ project:

- To find out reasons for siltation of Karli, Colamb and Talashil creeks in Malvan through a scientifically designed process
- Formation of a team of researchers who are working in a diverse fields including engineers, tour operators and fishermen
- Continuous dialogue with the community and scientists working in the field (marine and fishery)
- Develop a guideline for sustainability of creeks for fishery and tourism activity based on scientific and social facts
- Involve students and teachers in research, awareness and education on issue related to creek ecology
- Creating a pressure group to network among various line department for sustainability of creek and marine resources in Malvan.
- Group of individuals working in diverse fields coming together to discuss and find out reason for the sedimentation and siltation of creeks in Malvan through a scientifically designed methodology.

Implementers: CEE ICLAI and SWEDESD and SANGAM team Malvan

Dates: 2011 onwards

1. Background information

General:

- Details on the location/ geographical dimensions: Malvan, Shindudurga Maharashtra
- Kind of resource management, livelihood practices: Traditional fishery (Ramponkar), agriculture in saline reclaimed areas, and mangos in hill areas
- History: use of resources/ cultural practices / key events and projects: Malvan is known for its salt resources, fishery and traditional cuisine. Malvan also known for its traditional dance, history and unique culture. Shindudurga fort constructed in the sea is an added historical/archaeological site which is constructed by King Shivaji Maharaj.

Conditions:

- climatic, geographical, ecological, socio-economic, demographic, cultural context: Malvan is situated on the west coast of India and falls in Western Ghats region. Ecologically, the region is rich as it harbours species which are unique to the Ghats and to that of estuary and ocean. The people of Malvan have sufficient landholding to support their livelihoods and fishing is a

major activity. The population mainly consists of fishing communities who are known for their creative songs and dances and special Malvani cuisine.

- Natural hazards and recent disasters in the area: No
- Climate change vulnerability information for the area, if available: Since the area especially the creeks are facing a huge danger of sedimentation thereby posing problem for the fishing community. Since, Malvan now famous for the tourism activity which is also dependent on creeks and water, also faces problem. CRZ violation are rampant. Sand dune vegetation is being cut, the riverbanks are eroding due to high siltation in the rivers etc.

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area: The area is unique and rich in terms of marine and terrestrial diversity

2. General description of project / initiative / effort

- Purpose / objectives: To scientifically study the issue of Siltation and support for sustainable development of fisheries and tourism related activities
- Implementing entity / partners: Team SANGAM, CEE and SWEDESD
- Project / initiative duration

3. Process of implementation

- Actors: Who is involved in the process: Local community and all stakeholders
- Tools: What implementation tools/ techniques have been used? Formation of SANGAM Team. Study the problems with both the angle (Scientific and Social perspective). Informal meetings and later formal open consultation meetings helped in communicating better the intent of the project and stakeholder opinion. This was a major approach for consensus building.
- How the participatory approach used? What communities were involved in the process? In what ways? Continuous interaction with the community by organising workshops, writing in the newspapers and field visits. Development of questionnaire for understanding people's perception of Sustainable development and issue related to creek siltation, fishery and tourism. The fisher communities were the primary targets.
- How are communities affected by the initiative (positively/negatively)?: An objective study has been carried out to assess the problem involving local community and scientific literature review and recommendations based on this developed and discussed with the community. The mostly agree to the findings and are in a better position to get a holistic view and lend support for the project.
- Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved? NO. Since the project team was involving all the stakeholder and to study the problem related to their livelihood, community supported extensively. The focus on livelihood aspects and linkages helped to keep this as priority for discussions and their sustained interest.
- What particular success/ difficulties did the implementation met with?
    1. Formation of a SANGAM team involving 10 members from different fields including engineers, social and fishery scientists and fishermen and journalist
    2. Objective study of the environmental issue
    3. Involvement of school students and teachers in documenting the fishery resources
    4. Development of strategy to use for the sustainable development of fishery and tourism activity in Malvan.

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- biodiversity conservation: Yes. The school students are involved in documenting fish diversity of Creeks in Malvan. This is an important aspect as it also would lead to better maintenance of biodiversity registers for this region.
- livelihood security and sustainability: Strategy developed would help in conserving the biodiversity of creeks for local livelihoods and tourism activities. There would be less anthropogenic pressure on the creeks and better fisheries management.

- Influencing policies/ decisions at a broader scale: The strategy developed is with the involvement of locals through continuous interaction with the locals. This will help in longterm conservation of biodiversity of creek.
- Changes in the perception of local communities towards conservation (How the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?): Through the process of inquiry, the locals have come forward for the development of inclusive strategy for the conservation of creek biodiversity, this makes everyone from the community to be part of the project and pursue sustainable options for harvesting fish resources and utilization of biodiversity of creek area.
- Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation: Through the newspapers, issue was highlighted.
- Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation? Yes

5. Discussion

- What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.: Formation of the team was a success and all the members have shown a keen interest and greater dedication for solving the problem of unsustainable way of tourism activity and danger of rapid siltation of creek
- Sustainability: What is needed to maximize results and achieve sustainability? : Implementation of the recommendations proposed and strategy adapted
- Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?) : Can be replicated. This was a collective approach and inquiry process to find out reason and develop recommendations based on detailed study
- Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations: Supported activity
- If possible, compare to alternative solutions, i.e. the interventions without a participatory approach
- If possible, compare to similar initiatives implemented in other settings

6. Recommendations / Conclusions

Malvan is known for its salt, fish, traditional dances and biodiversity rich area. Traditionally, the activity of people was fishing and agriculture. In recent times, after Shindudurg declared as a tourism district, Malvan has become very famous tourism destination. The tourism is dependent on the water sports, fishery and Malvani cuisine. Due to unplanned activities both sea ward and on the hills, the creeks are facing danger of rapid siltation. If the rate of siltation continuous, it will have negative impact on both the fishery and tourism. To understand this problem, CEE supported a project "Supporting Urban Sustainability" in Malvan. The objective was to do a scientific inquiry of an environmental issue considering Social, environmental and economic aspect. CEE has been able to constitute a team SANGUM involving different stakeholders to study the problem of creek and come out with proper recommendations. The team did the study through a scientifically designed questionnaire, field visits and scientific literature review. The project period was for one year. Recommendations for sustainable development of creeks have been developed that supports both the fishery and tourism activity in Malvan region.

GOA

7. The Ramponkars - Community fishing in the offshore waters

Ramponkar a traditional fishing practice is practiced on the coastal areas of Goa and Konkan Maharashtra is one such practice which has helped in sustainable harvesting of fishery resource and benefitted all the people belong to fishing community. The fishing is done on the offshore waters and estuarine areas. The catch is equally divided among the community. The space on the beach is optimally used for the purpose of netting, mending and fish drying etc.

Title: Ramponkar (Community fishing in the offshore waters)

Author(s): Mr. Sujeet Kumar Dongre, CEE

Name of the State and study Location: Goa

Objective of the initiative/ project:

- Community Fishing
- Sustainable Fisheries Management

Implementers: Local Community

Dates: Centaury old tradition

1. **Background information**

General:

- **Details on the location/ geographical dimensions**: Entire Goa coast
- **Kind of resource management, livelihood practices**: Community fishing and coastal resource management
- **History: use of resources/ cultural practices / key events and projects**: The community fishing practice is an age old practice. The Community of a particular village forms a informal association and goes for fishing in the offshore water not more than a km inside the sea. The catch is equally divided among the community. The fishing gears used are traditional and it will not have any adverse impact on the fishery stock.

Conditions:
climatic, geographical, ecological, socio-economic, demographic, cultural context: Goa is situated: The State of Goa, with an area of 3700 km2, is located along the mid-west coast of India between coordinates 14o53’57” to 15o47’59” N and 73o40’54” to 74o20’4”E. Land use is dominated by agriculture (35%) and forest (39%). The territory is divided into four physiographical subdivisions and three terrains, the hilly region towards east, the intermediate undulating tracts and the level and low-lying lands along the coast. It consists of a chain of high and imposing hills cut by deep gorges, steep valleys and ravines, constituting Western Ghats in the east, the coastal plains in the west and intermediate undulating tracts and planes and low lying land in the centre. The coastline of Goa is about 105 km long.

- Natural hazards and recent disasters in the area. NO
- Climate change vulnerability information for the area, if available: No

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area: Goa is known for its rich diversity of life forms. The two major rivers viz. Mandovi and Zuari have major Mangrove vegetation. A mangrove eco-system situated on the bank of river Mandovi is the Chorao

mudflat island - declared as Dr. Salim Ali Bird Sanctuary. Goa has kept intact its beach vegetation and supports a number of species of mangroves.

2. **General description of project / initiative / effort**

- Purpose / objectives: Sustainable Fishery harvesting
- Implementing entity / partners: Community with support from the Fisheries Department, Govt. of Goa
- Project / initiative duration: Throughout the year

3. **Process of implementation**

- Actors: Who is involved in the process: Community
- Tools: What implementation tools/ techniques have been used? Fishing net
- How the participatory approach used? What communities were involved in the process? In what ways? It is community driven participatory process. 100 percent involvement of community in the project
- How are communities affected by the initiative (positively/negatively)? The fish catch is equally divided among the community
- Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved? NO
- What particular success/ difficulties did the implementation met with? Recent years, due to introduction of mechanised trawling and mass tourism on the beaches, the Ramponkars are facing problem of fish catch as big trawlers are fishing within the zones earmarked for the Ramponkars. Beach tourism occupies the space hence, the fishermen do not get space to dry and mend their fishing nets

4. **Outputs and Outcomes**

- What was achieved (or not) in practical terms, with regard to the following:

- biodiversity conservation: Yes. It is a community based fishing practice and the net used is devised in such a way that it will catch only specified fish and not the sub-adult or juveniles
- livelihood security and sustainability: Since entire community is involved in the fishery harvesting, care is taken to judiciously harvest the resources and not harm the biodiversity of given area
- Influencing policies/ decisions at a broader scale: The Ramponkars are now recognised as organised fishery activity
- Changes in the perception of local communities towards conservation (how the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?): NO
- Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation: Yes. This practice is not recognised at the policy level and considered as traditional fishing activity
- Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation? Yes

5. **Discussion**

- What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.

a. The Ramponkar practice is based on community involvement has kept it intact so far. Unfortunately, now because of entry of large mechenised trawling and they fish in the waters designated for the traditional fishermen, the fish catch is going down.

b. The mass beach tourism has also impacted on the traditional beach activities of fishermen as they do not get adequate space for drying ane mending

c. Conflict between government established institutions and local communities. In Goa, there is unrest between the MPT and local community for want of beach space and jetties for fish landing.

- Sustainability: What is needed to maximize results and achieve sustainability? : Strict implementation of laws and regulations and do not allow the large mechanised trawlers to fish in the waters designated to the traditional fishing communities
- Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?) : Yes. It is a proven traditional practice which has kept the fishery resource intact and conserved the marine biodiversity
- Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations: Community is benefitted out of this activity
- If possible, compare to alternative solutions, i.e. the interventions without a participatory approach
- If possible, compare to similar initiatives implemented in other settings

6. **Recommendations / Conclusions**

Since the practice is a century old and fully community based, it adds values to the resources and creates sustainable livelihood opportunity to the locals on the coastal area. The fishing is done using traditional

8. Community involvement in Marine Turtle Conservation in Morjim, Agonda and Galgibaga with the support of Goa Forest Department

Author(s): Mr. Sujeet Kumar Dongre, CEE

Name of the State and study Location: Goa, Morjim, Agonda and Galgibaga

Objective of the initiative/ project:

- Community involvement in Sea Turtle Conservation
- Sustainable tourism

Implementers: Local Community and Goa Forest Department

Community of Morjim, Agonda and Galgibaga. Priest of Galgibaga beach and Goa Forest Department

Dates: Started in 1996

1. Background information

General:

- **Details on the location/ geographical dimensions**: Morjim, Agonda and Galgibaga
- **Kind of resource management, livelihood practices**: Marine turtle nesting habitat conservation, sustainable tourism
- **History: use of resources/ cultural practices / key events and projects**: It was the community-lead initiative of protecting sea turtles that lead to formal conservation efforts by the Goa Forest Department. Capt. Gerard Fernandes and Rev. Fr. Mariano of Galgibaga church took initiative to mobilise the population towards protecting the marine turtle habitat by providing incentives. Later, the Goa Forest Department joined hand with the local community and appointed paid volunteers from the villages to protect and safeguard the nesting habitat. Since then, these beaches have been recognised as marine turtle nesting sites. Now, these sites have been formally recognised as turtle nesting sites in the CRZ Notification 2011 and warrants to have a special management plan so as protect the nesting sites and allow sustainable tourism on these beaches

Conditions:

climatic, geographical, ecological, socio-economic, demographic, cultural context: Goa is situated: The State of Goa, with an area of 3700 km2, is located along the mid-west coast of India between coordinates 14o53'57" to 15o47'59" N and 73o40'54" to 74o20'4"E. Land use is dominated by agriculture (35%) and forest (39%). The territory is divided into four physiographical subdivisions and three terrains, the hilly region towards east, the intermediate undulating tracts and the level and low-lying lands along the coast. It consists of a chain of high and imposing hills cut by deep gorges, steep valleys and ravines, constituting Western Ghats in the east, the coastal plains in the west and intermediate undulating tracts and planes and low lying land in the centre. The coastline of Goa is about 105 km.

- Natural hazards and recent disasters in the area. NO
- Climate change vulnerability information for the area, if available: No

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area: Goa is known for its rich diversity of life forms. The two major rivers viz. Mandovi and Zuari have major Mangrove vegetation. A mangrove eco-system situated on the bank of river Mandovi is declared as Dr. Salim Ali Bird Sanctuary. Goa has kept intact its beach vegetation and supports… number of species of mangroves.

2. General description of project / initiative / effort

- Purpose / objectives: Marine turtle conservation and sustainable tourism
- Implementing entity / partners: Community with support from the Goa Forest Department, Govt. of Goa
- Project / initiative duration: Eight months from October to may

3. Process of implementation

- Actors: Who is involved in the process: Community and Goa Forest Department
- Tools: What implementation tools/ techniques have been used? Volunteers and fishing nets to safeguard the nests
- How the participatory approach used? What communities were involved in the process? In what ways? It is community driven participatory process. All stakeholders including the shake owners have been cooperating with this effort
- How are communities affected by the initiative (positively/negatively)? Protecting sea turtles means protecting the beach habitat
- Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved? For last few years, due to increase in tourism influx, there is shift from turtle conservation towards tourism. However, timely intervention of Goa Forest Department and Govt. of Goa and CRZ Notification the beach is safe for the nesting. A section of beach is clearly demarcated for the nesting. No shacks of any other structures which are harmful for turtle nesting are prohibited. NO lights after 7 pm is prohibited through a government notification
- What particular success/ difficulties did the implementation met with? The Goa Forest Department has recruited the turtle volunteers in the department on temporary status. There is ownership of the project among the community people hence continuing. Recently, since there is increase in tourism influx, there seems to be controversy between interest of conservation and tourism

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- biodiversity conservation: Yes. It is a community driven activity has community ownership. enrichment of beach
- Influencing policies/ decisions at a broader scale: The Ramponkars are now recognised as organised fishery activity; The nesting sites are declared as turtle nesting sites in the CRZ

Notification,

- Changes in the perception of local communities towards conservation (how the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?): NO
- Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation: Yes. This practice is not recognised at the policy level and given special status under CRZ Notification 2011
- Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation? Yes

5. Discussion

- What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.

a. Community driven activity hence there is ownership

b. Goa Forest Department supported this activity and appointed local paid volunteers from the nesting villages and recruited them as temporary labours in the department

c. Special status in CRZ 2011. needs to have special management plan

d. Known worldwide as turtle nesting site

- Sustainability: What is needed to maximize results and achieve sustainability? : Strict implementation provisions of laws, education and awareness. CEE has initiated the sea turtle conservation education programme and created awareness among larger masses and it has helped a lot in turtle conservation efforts
- Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?) : Yes. It is best example of community initiative and got policy recognition, classified as CRZ 1 area and needs a special management plan.

6. Recommendations / Conclusions

If there a community participation, things can work and now has become a classic case since it is recognised as turtle nesting sites under CRZ Notification, 2011. Education and awareness can play a greater role in biodiversity conservation participation.

KARNATAKA

9. Government efforts towards estuarine biodiversity conservation – case of Hiregutti.

The Aganashini estuary in northern Karnataka has rich biodiversity and the ecosystem services the livelihood needs of the local fisher community. However, the wetland area of this estuary has been earmarked for establishment of port and harbours. A significant portion of the land belongs to the Karnataka Industrial Development Corporation (KIDC), which was reserved for industrial development. Historically, salt pans were promoted around the estuary, but then closed down due to losses. Later, the local Forest Department undertook a eco-logical restoration effort by introducing mangrove seedlings and saplings towards the eastern side of the estuary. The efforts were made silently but involving the local village community. Today, there is an extensive mangrove plantation with different varieties and covering around 2000 acres. This effort has helped generate interest amongst the local community as well as the government to conserve the estuary biodiversity and find ways of legally protecting this area – probably as a biodiversity heritage site.

Title: Government efforts towards Estuarine biodiversity conservation – case of Hiregutti.

Author(s): Mr. Shriji Kurup, CEE

Name of the State and study Location: Nushikote-Hiregutti village; Aganashini estuary; Karnataka

Objective of the initiative/ project:

- To promote mangrove establishment and conserve local livelihood

Implementers: Forest Department, Hiregutti

Dates: 2004 onwards

1. Background information

The project site extent of around 2000 acres is located on the eastern end of Aganashini estuary. The estuary has relatively been undisturbed. However significant portions of the land surrounding the estuary, particularly the wetlands are under the Karnataka Industrial Development Corporation (KIDC). This land has historically been used for agriculture (paddy cultivation) purpose. There was a bund to regulate the salt water flow from the Aganashini estuary. When the bund broke, due to increased salinity intrusion, the farming activities declined. Then around the 1970s the Government of Karnataka acquired the land for salt manufacturing by Ballarpur industry. However, due to low productivity, the salt works were abandoned and the area could not be restored for agriculture purpose also. Most of the land remained abandoned, non-productive and as a wasteland. The landownership was and continues to be with the KIDC. Subsequently, In 2005, the Forest Dept. initiated activities to utilize the land for establishing mangrove plantation and conserving the local livelihood.

2. General description of project / initiative / effort

The Forest Dept. noticed sporadic presence of mangroves along the KIDC land area. This encouraged them to try out other mangrove varieties on a trial basis. They collected mangrove seeds from Kundapur to Karar coast. The forest guards and local people tried dibbling these seedlings at certain spots considering the water flow and soil conditions. They relied on the knowledge of the local elderly community people for identifying locations for dibbling the seedlings. They jointly and informally started monitoring the growth and were surprised to find good survival rates and growth. The results motivated

the Forest Dept. to cover more area and engage more local people in the establishment of the mangrove seedlings. Involving the women members from the Nushikote village adjacent to the project site, they formed the Village Forest Committees (VFC). There are around 260 members currently. The VFCs were given training in mangrove plantation and incentives for protecting it. No grazing was allowed in the area. Subsequently, the mangroves established very well and the villagers could see a direct rise in their fish catch and variety of fish being caught from the estuary waters. Further, the Forest Dept. also helped in getting the local people LPG connections so that they may not turn to use the mangrove area for fuelwood collection. The Forest Dept. and the local people feel that the abandoned KIDC area is very suitable for mangrove establishment and has the proper hydrological and ecological conditions. The combined effort of Forest Dept. and local community from Nushikote has helped in preserving the estuarine biodiversity and its characteristics, which otherwise might have turned into a major wasteland, considering it was not utilized for any productive purpose. The effort provides local community from the Hiregutti village to participate in mangrove establishment activities and also harvest fish, crab, prawns from the established mangrove area.

3. Process of implementation

The project began by the Forest Department identifying suitable portions of the unutilized land of the KIDC in the estuary region for establishment of mangroves. Initially, only the team members from the forest department were involved in collection of seeds (which were procured from different parts of the coast in Karnataka). Advice on its plantation, hydrological conditions etc. were also sought from the village elders and traditional estuarine fishers. The initial activity had almost no inputs from mangrove experts, but relied on their traditional wisdom.

The local community were informed and aware about the mangrove establishment initiative and their voluntary commitment not to destroy the saplings. Later, with continuous one to one interaction with the members and leaders from the village, the Forest Dept. was able to formulate an incentive mechanism whereby the local community from the adjacent village could be engaged in seed collection, dibbling and protection. Self Help Groups (SHGs) were formed and provided wages in return for mangrove establishment related activities.

4. Outputs and Outcomes

The effort by Forest Department and the local community has helped in:

- Establishing a mangrove plantation area with different varieties, the extent reaching over 1000 acres at present. This did not have any external expert input, but was through their own effort and traditional knowledge about the estuary water flow, soil character and protection measures.
- Community consent ensured utilization of the KIDC land, which otherwise was remaining unutilized.
- The effort has been silent, in the sense it did not seek to attract attention from NGOs, Govt. or Industries. It is almost like a protected area – relatively undisturbed, but with a high sense of respect for not disturbing the mangrove plantation area.
- This area has characteristics of a Community-managed conservation area and less vulnerable to political changes, and work effectively with very low operational costs.
- Community confidence was gained by closely interacting with local leaders and periodic meetings with Forest Dept. officials.
- The dedication of the Forest Dept. team, particularly the field staff in actively and relentlessly pursuing mangrove plantation and protection has increased the confidence of the local community in Forest Dept. efforts, intention and cooperation.
- There success of the mangrove plantation and its establishment has given enough scientific and legal reasons now to protect the project site and its surrounding areas as Biological heritage site or Community Conserved Area and thereby offering decision makers better options for the management of Aganashini estuary.
- The Forest Dept. and local community now see a hope of conserving Aganashini estuary biodiversity and associate livelihood of the local community dependent on the estuary resources. They can take better informed decision of whether the area should be used for such mangrove plantations or industrial activities or new developments like the Port being proposed at Tadadi – near the mouth of the estuary.

5. Discussion

The key success in this project was the single minded determination of the Forest Dept. officials to pursue mangrove plantation and utilize the unproductive land of the KIDC which was suitable for mangrove establishment. The initial efforts were purely driven by self-motivation, under no scheme, but with a vision to protect, conserve and strengthen the estuary biodiversity.

The right approach by the Forest Dept. of involving the local community, particularly intense interaction with the elderly people and estuarine fishers who hold lot of traditional knowledge, helped in undertaking the mangrove plantations, in spite of the lack of external expert inputs on mangrove establishment. Significantly, this area does not have the widely popular, 'fish-bone' structure for mangrove establishment, signifying how this effort has been almost local, without external input and almost silently done.

The initiative or project by the Forest Dept. offers important learnings in terms of how traditional knowledge of the communities can be tapped for success in mangrove conservation and also how they could be motivated to protect plantation efforts while not relying too much on the incentives for establishment. The community now knows about the mangrove have helped improve their fish catch and some of them are directly engaged in mangrove swamp fish collection, crab collection etc. which helps the poorest and most need to secure their food and livelihood. engaged in evolving marine biodiversity conservation plans, making the process participatory and co-managed.

The area can be considered as a case of community conserved area and could be taken up for designation under legal protection by declaring it a biological heritage site. The issue of the land ownership under the KIDC remain though if the land is utilized for any industrial / commercial activity in the future. The Forest Dept. and local community have an apprehension that the existing mangrove plantations may be destroyed in case the KIDC wants to take this up for industrial activity purpose, since the land legally belongs to them.

The future development works like the Port establishment at Tadadi (near the mouth of the estuary) and such infrastructure activities may affect the biodiversity of this area, obstruct water flow and affect livelihood of the local people. This is also their apprehension and would like to have a master plan developed for the Aganashini estuary to conserve its ecosystem services and biodiversity.

The Forest Dept. officials also now feel that it is a good time to introduce Eco-tourism activities and would like to be guided for the activity. This they say would help in improving public awareness and the benefits derived for conserving biodiversity and improving the socio-economic conditions of the local people. The local people too are open to this idea.

On the scientific front, the Forest officials and local people have expressed a viewpoint that their as per their observations on the growth of mangroves on this site, the mangrove here exhibit faster growth rates than mangroves observed elsewhere. This also calls for more expert inputs for this project site to guide its future establishment, with scientific inputs and holistic management plan, while still retaining the traditional wisdom.

References:

Meeting with Forest Range Officer and field observation.

Contact for information: Shri Tirupatiraddi Neelannavar, RFO, Hiregutti, Ta. Kumata, Uttar Kannada District (o) 08386-279769

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Figure 1: Mouth of the Aganashini estuary between the hills in background. The meandering backwaters and inlets are seen in foreground. Opposite to the mouth, towards the eastern end is Nushikotte village where the community has planted and protected mangroves with leadership from the Forest Dept.

Figure 2: Mangrove saplings planted and protected by community at Nushikotte

Figure 3: Shri Tirupatiraddi Neelannavar, RFO, Hiregutti (left) and field staff explaining their mangrove afforestation efforts in Nushikote.

Figure 4: local fishers harvesting fish from mangrove community

All photographs in this case study by Mr. Shriji Kurup, CEE

10. Conserving traditional coastal agriculture practices and germplasm protection

In Yennemadi hamlet of Herigutti village, adjacent to the Aganashini estuary in north Karnataka coast is the farmer Mr. Venkatraman Batagu Patoga. Though this area has witnessed shifts in paddy cultivation to hybrid varieties and also issues with unobstructed flow of water in the estuary tail ends, this farmer has continued to cultivate the traditional paddy variety called the *Kagga*. The unique traditional knowledge is preserved by this farmer family by being able to utilize the salt water in the estuary to actually grow the paddy variety, in spite of it having no commercial value. He also manages to not leave the field uncultivated in spite of the blocking of the water flow from the estuary due to the construction of bunds for laying railway lines by the Government. The *Kagga* rice is utilized for their domestic consumption and no pesticides or urea is used during its cultivation. The farmer family continues to cultivate it in order to preserve the low lying paddy cultivation area – called the *Gajini* and also their own perception it being more nutritive value than the hybrid variety. They do cultivate the

hybrids like the *Jaya* variety in fields that are further away from the estuary waters, but that is for their income purpose. The case presents how traditional knowledge and individual poor farmer families contribute to the preservation of germplasm and conservation of *Gajini* areas for cultivation, lest it be utilized for other purposes or get ignored and turn into waste lands.

Title: Conserving traditional coastal agriculture practices and germplasm protection

Author(s): Mr. Shriji Kurup, CEE

Name of the State and study Location: Yennemadi hamlet of Hiregutti village; Aganashini estuary; Karnataka

Objective of the initiative/ project:

- This is a traditional paddy growing practice being continued by the present generation of farmer families along the Aganashini estuary for their food security and livelihood purpose.

Implementers: Traditional farming community of Yennemadi hamlet

Dates: traditional practice - evolved through earlier 2-3 generations.

1. Background information

The case study site is the Yennemadi hamlet of Hiregutti village adjacent to the Aganashini estuary in northern coastal belt of Karnataka. The farming family of Mr. Venkatraman Batagu Patoga raised the traditional paddy variety called the *Kagga* in the low-lying areas called the *Gajini* and uses the natural tidal flow of salt water in the estuary to cultivate the paddy variety, which is the special feature, since other modern day hybrid varieties cannot grow in such conditions. The field near to Mr. Venkatraman has also seen the construction of huge bunds by the Government in order to lay the railway line. This has caused obstruction of estuary water flow to the *Gajini* area and affected the *Kagga* cultivation. However, the family continues to cultivate it in spite of several hardships for their food security. The result is the conservation of a unique paddy germplasm, which otherwise would not have happened.

2. General description of project / initiative / effort

This is a case of traditional practices and initiated several generations ago by farming community of Hiregutti village. They had adapted to the Aganashini estuary ecosystem conditions and been able to grow a paddy variety called the *Kagga* which grows in salt water conditions.

3. Process of implementation

The farmer – Mr. Venkatraman says that moderate salt water is regulated to flow from the estuary into the low lying paddy field which is locally called as the *Gajini lands.* They have made sluice gates and earthen bunds to regulate the flow. The *Kagga* paddy variety is sown in these field and grows in the salt water during the month of June. No pesticides or urea are used. The paddy grows to a considerable height (higher than the hybrid varieties) and its tillers are lush green and dense. The tillers form a sort of canopy and after some time no sunlight is able to penetrate the saltwater below it. This prevents any weeds from growing and no use of weedicides or additional labour. Further, pests are also not able to survive in these conditions. Finally, after 3 months the *Kagga* variety paddy crop is harvested.

Mr. Venkatraman informs that the *Kagga* variety has a good taste compared to the hybrid varieties. However, it has a lower market value. They use it for their personal consumption.

A few 100 meters away from the *Kagga* paddy field is another set of fields in which Mr. Venkatraman grows the modern *Jaya* variety hybrid rice. This field uses only freshwater and no estuary water is let into it. The variety cannot tolerate saline conditions. They raise this crops since it has commercial value and is a source of income for them.

Currently, Mr. Venkatraman faces the threat of the water flow from the Aganashini estuary not reaching his *Kagga* variety paddy field area due to the construction of huge bunds for laying railway line by the Government. They have not provided proper sluice pipes in the bund and hence salt water does not flow but rather stagnates which was earlier not the case. This increases the salinity levels.

This has affected his *Gajini* field – in fact losing its distinct character of allowing water flow from estuary to field and back. This year, due to the prolonged stagnation of salt water, the *Kagga paddy* standing crop got uprooted and wilted away.

The *Kagga paddy* fields which are very close to the railway track are now fallow and only some area is cultivated by Mr. Venkatraman. However, he continues to put his efforts to grow the *Kagga variety,* since he says its part of their life, way of life which gives them the unique identity. He also states that growing the traditional variety involves very less external inputs, low costs, keeps them busy on field, is good for their health and the nutritive value is more for their children's health and wellbeing. His sons also know about the paddy cultivation method, but hopes that external influences like the railay lines and blocking of the estuary does not take away their *Gajini land* leaving them unable to preserve the *Kagga variety* and continue with their traditional paddy cultivation practice.

4. Outputs and Outcomes

The effort by Mr. Venkatraman has helped in the following biodiversity conservation:

- Conserving the existing low-lying Gajini areas adjoining the Aganashini estuary, by continuing to keep it productive by raising the Kagga paddy variety which can only be the unique variety that can grow in the salt water and unique water flow conditions.
- Conserving the germplasm of traditional paddy variety, in spite of the lure to switch over to modern hybrid varieties.
- Preserving and disseminating the traditional knowledge of paddy cultivation and management of salt water flow for paddy cultivation – to his sons and younger generation.
- Not leaving the field uncultivated or fallow in spite of the obstruction of the estuary water flow due to the construction of railway lines and bunds adjacent to his field.

5. Discussion

The key success in this case of biodiversity conservation is the pursuit of growing the *kagga variety* even through it does not have commercial value. Mr. Venkatraman says that his generation has learnt the technique of growing this variety in salt water conditions from his forefathers and that for him it is but natural to continue growing it. He enjoys cultivating this variety and does not consider it good / ethical to leave the paddy field fallow. Again, he cherishes the physical effort that goes in its cultivation and values the nutritive elements of this variety which he feels is good for his children and family.

The case brings out an important lesson for the modern day environmentalists and policy makers that biodiversity conservation (especially farming related and around estuaries and backwaters) is a result of farmers keeping the low-lying *Gajini* areas productive by growing the *Kagga variety.* Otherwise these lands would have been left fallow and utilized for other purpose, losing its distinct ecological character and associated biodiversity. Again this case is a proper case of germplasm conservation (of a traditional paddy variety), although the farmer may not be doing it for germplasm conservation purpose. However, there has to be other ways of conserving the germplasm and keeping it safe.

The was the single minded determination of the Forest Dept. officials to pursue mangrove plantation and utilize the unproductive land of the KIDC which was suitable for mangrove establishment. The initial efforts were purely driven by self-motivation, under no scheme, but with a vision to protect, conserve and strengthen the estuary biodiversity.

These farmers should be recognized as conservators of germplasm, protectors of *Gajini land* without an iota of gaining incentive for doing so. The traditional farmer – Mr. Venkatraman may be doing this cultivation for his food security, but the effects are certainly that of biodiversity conservation and continuity of the germplasm due to his efforts. Coastal agriculture / farming must check for such traditional paddy cultivators and give support for continuing their activity.

References:

Field observation, meeting with Mr. Venkatraman – traditional farmer at Hiregutti along with forest officials.

Related reading article: "Kagga in peril", Aparna Pallavi, Down to Earth, Jan 15, 2014 – www.downtoearth.org.in

Contact for field visit info:
Shri Tirupatiraddi Neelannavar (or field staff)
RFO, Hiregutti,
Ta.Kumata,
Uttar Kannada District
(o) 08386-279769

Fig 1: Kagga paddy field in the Gajini land adjacent to estuary mouth. Background horizon is the earthen bund made for constructing railway line along the border of the paddy field.

Fig 2: Kagga rice (left with husk), Kagga rice without husk (top), hybrid rice - Jaya variety - white (right)

Fig 3: Traditional Farmer, Mr. Venkatraman of Yennamadi hamlet of Hiregutti village – showing the Kagga paddy field

Fig 4: Paddy field growing hybrid paddy - Jaya variety - away from estuary bank and outside Gajini area

All photographs in this case study by Mr. Shriji Kurup, CEE

KERALA

11. Kolavipalam- A Safe Heaven for Olive Ridleys

Olive Ridleys used to visit Kolavipalam beach every year to lay eggs but their eggs were being poached by dogs, jackals and human beings. In 1992, a group of youth, who started observing the turtles and reading about them, realized these were Olive Ridleys and started guarding their nests day and night. Soon the 8000 or so villagers joined their effort and are involved in protecting the turtles. An NGO *Theeram Prakriti Samrakshana Samiti* (Coastal Environmental Protection Group) was established in 1998. A hatchery has been built to protect the eggs. Since 1998, the Forest Department has been contributing towards the salary of six guards for six months from their World Bank aided Kerala Forestry Project. The NGO also works on regenerating mangrove plantations. The major threats to the turtles are now from indiscriminate sand mining and construction activities in the area. Theeram volunteers now continue to protect the turtles and their nests and the beach has a lot of visitors to see the hatchlings every year. The NGO and the people are also working on a proposal to declare this beach as a Marine National Park.

Title: KOLAVIPALAM – A SAFE HAVEN FOR OLIVE RIDLEYS

Author(s): Ms. G. Padma, Programme Coordinator, CEE Kannur Field Office

Name of the State and study Location: Kerala, Kolavipalam

Objective of the initiative/ project: To ensure safety and protection for the Olive Ridley turtles that visit the beach to lay eggs

Implementers: Theeram Prakriti Samrakshana Samiti and local people

Dates: 1992 onwards

1. Background information

General:

- **Details on the location/ geographical dimensions**
  Kolavipalam beach is a coastal stretch in Kozhikode District between Payyoli and Kottapuzha estuaries.
- **Kind of resource management, livelihood practices**
  Fishing, farming, blue collar, small business and other occupations
- **History: use of resources/ cultural practices / key events and projects**
  Kolavipalam is one of the beaches in North Kerala where the Olive Ridleys come to lay eggs. The coast is a typical one with no special features as such. It was a group of youth who observed the turtles visiting every year, read up on it, realised this was the endangered Olive Ridley and decided to protect their eggs and hatchlings.

Conditions:

- **Climatic, geographical, ecological, socio-economic, demographic, cultural context**
  Kolavipalam has a tropical monsoon climate and the coast remains humid throughout the year. It receives rains from both the southwest and northeast monsoons. Being a coastal area, fishing is an important activity. Boat repair, small business, teaching etc. are other occupations. The nearest town is Payyoli, well known for being the native place of P T Usha, India's Olympic athlete. Iringal Craft Village is about 3 km from this place.
  Natural hazards and recent disasters in the area
  The last monsoon had brought in very heavy rainfall during June-September all over Kerala, including this area. This had led to some amount of flooding and sea incursions.
- **Climate change vulnerability information for the area, if available**

There is no information directly relating to climate change though shrinking of the beach is a major concern for the people.

Coastal and marine biodiversity:

- **Brief on the habitat, species and genetic diversity present in the area**
  Kolavipalam has a coastal habitat typical of Kerala with the attendant biodiversity. What sets it apart is the Olive Ridley turtles which have found this estuary an ideal place to lay their eggs. The marine, rodents, insects, birds, and other species are as commonly found in the region. The coast also has mangroves.

2. General description of project / initiative / effort

- **Purpose / objectives**
  To protect the Olive Ridley turtles that come to lay eggs on the coast, to protect the eggs from being poached by keeping them in hatcheries and releasing the hatchlings in the sea
- **Implementing entity / partners**
  Theeram Prakriti Samrakshana Samiti, now aided by Forest Department
- **Project / initiative duration**
  The project is ongoing since 1992, though the NGO was formed in 1998.

3. Process of implementation

- **Actors: Who is involved in the process?**
  About a dozen youth who started the NGO for protecting the turtles and the local people
- **Tools: What implementation tools/ techniques have been used?**
  A participatory approach is being used in ensuring the safety of the turtles. This is achieved by the NGO which creates awareness in the local population about the endangered status of the turtles and getting them to stop using the eggs in their diet. Besides, the patrolling on the beach during the egg laying season -
  September – February – is being undertaken by volunteers from the community, who willingly do this after their regular occupations.
- **How the participatory approach used? What communities were involved in the process? In what ways?**
  People from different fields are involved in the process. Due to the initiative of the NGO, there has been widespread awareness among the people about the turtles and also generally about the need to conserve biodiversity.
- **How are communities affected by the initiative (positively/negatively)?**
  The communities have been affected positively due to the initiative. Now, besides protecting the turtles, the people are also campaigning against sand mining and construction activities on the beach which is eroding the beach and destroying the biodiversity of the area. The NGO and the community are also involved in protecting and increasing the mangrove cover in the area.
- **Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved?**
  The project has not generated any particular controversy in the community.
- **What particular success/ difficulties did the implementation met with?**
  The main difficulty in the implementation has been the lack of awareness in the people about the turtles and its importance. The turtle eggs were considered a delicacy and became part of the people's diet during the egg laying period. This was rectified by the awareness created by the NGO Theeram. Being a participatory initiative, the project now extends to other issues related to the coastal stretch like sand mining and mangrove plantation.

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- **biodiversity conservation**
  Olive Ridley turtles and their eggs are being conserved. Now mangroves are also being conserved and increased as part of the initiative.
- **livelihood security and sustainability**
  Though this has not directly contributed to livelihood security, the initiative has been able to rope in volunteers from all walks of life into this activity as also employed six guards during

the egg laying period. Indirectly, this has also led to increased tourist traffic in the area to see the turtles – now known as turtle tourism, which has contributed to the earning potential of the local population.

- **Influencing policies/ decisions at a broader scale**
  Though this effort has not initiated any policy, it has ensured that the Forest and Wildlife Department supports the activities. This has also improved the tourist potential of the area as many people now come to see the turtles.
- **Changes in the perception of local communities towards conservation (How the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?)**
  There is definitely a big change in the perception of the communities towards conservation as evidenced by their giving up turtle eggs and volunteering to protect the turtles. They are also more aware of the threats to the coast now and are ready to campaign to protect the coastal area from erosion and intrusion. They also protect the mangroves in the area now.
- **Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation**
  There is definitely a change in the perception of decision makers and the scientific community in this regard. Considering the efforts put in to save the turtles and their eggs, the Forest Department has helped the NGO and the local people in setting up a hatchery for the protection of the eggs. Since 1998, the forest department has been contributing towards the salary of six guards for six months, from their World Bank-aided Kerala Forestry Project. On the other hand, the department has also sanctioned a project of Rs 4.5 lakh to construct a turtle hatchery at Vallikkunnu in Malapuuram District, though this is not a suitable nesting ground as per Zoological Survey of India. The Western Ghats Regional Station of ZSI has also conducted a study of the coast to confirm the destruction of mangroves and the denudation of the coastal area through sand mining.
- **Is the project / initiative / effort still on-going or not. If not, what led to its discontinuation?**
  The project is ongoing.

5. Discussion

- **What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.**
  It is the participatory approach adopted by the youth who started Theeram that has really worked to ensure success. Without the help of the local population, this could not have been a success. While the Forest Department has been supportive of the activity, their contribution can make the initiative sustainable only if they work out a feasible and long term plan for the coast and its biodiversity. The NGO is mostly working with contributions from their own members which needs to be more institutionalised and systematised. Their resource needs are not fully met from the contribution from the forest department.
- **Sustainability: What is needed to maximize results and achieve sustainability?**
  There should be more support from the government departments – especially forest, tourism, fisheries and CRZ committees, to this initiative. Only then will illegal activities like sand mining and construction be curtailed and the turtles and other life forms conserved and protected.
- **Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?)**
  Yes, the process can be replicated fairly well. A systematic identification of coastal areas preferred by turtles for nesting and protection by bringing in different departments to contribute are the most important factors. Resource support from government departments and scientific institutions is important in this regard.
- **Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations**
  There is no cost benefit analysis or economic valuations available. Increased tourist activity is an off shoot of this initiative, though.
- **If possible, compare to alternative solutions, i.e. the interventions without a participatory approach**
  Without a participatory approach, this initiative would not have survived as support of the local population was important for this venture. Poaching would have probably increased when

Theeram stepped in to protect the turtle eggs if the local community was not taken into the fold.

- **If possible, compare to similar initiatives implemented in other settings**
  There have been other initiatives in Thrissur (Chavakkad) and Kasargod (Neeleswaram/Kanhangad) districts of a similar nature to protect the Olive Ridley turtles that come to nest. In all cases, it is the participation of the local community that has contributed to the success of the venture.

6. Recommendations / Conclusions

- **Summarize key lessons learned and priority areas of action**
  A chance youth initiative in this small and inconspicuous coastal belt has led to the protection of the endangered Olive Ridley turtles and their eggs. The NGO Theeram that the youth formed has done the right thing in involving the community by making them aware of the status of the turtles and persuading them against consuming the turtles eggs. Without this, the initiative would not have achieved the success it did. The Forest Department has been supporting Theeram by contributing to build the hatchery and paying the salary for six guards for six months. Since tourist activity has increased, the Tourism Department could help by setting up basic facilities in the area while not intruding into the turtle's nesting areas. The scientific community has also been supportive.
  The real threats to the coast now come from sand mining and construction. The sand mining lobby has also been harassing the local population who are campaigning against this. Strong steps are needed not only to prevent sand mining but also protect the local population from being harassed by them. Fisheries department can also help by setting up facilities for the fisherfolk of the area.
- **Could also include forward-looking reflections, next steps and or immediate follow-up activities**
  More support to the NGO and those working to save the turtle eggs from the various departments is the need of the hour. Banning or at least curtailment of sand mining, banning construction on the coast and scientific studies of the coast to improve its biodiversity are the next steps that need to be taken. Mangrove plantation should also be supported by the Forest Department in a more substantial way.

Annexes

1) **Photos, satellite images, maps, graphs and other visuals**
2) **Statistics**
   Area of Kolavipalam: 8 km stretch
   Population: 10000 (approx)
   Nearest city: Kozhikode – 37 km away
   Occupation: fishing, farming, small business
   No of hatcheries: 1
   Fund sources: Members of Theeram, Forest department

3) **Related links**
   http://www.indiatogether.org/2003/jan/env-turtker.htm
   http://www.hindu.com/2009/09/18/stories/2009091850160200.htm

   http://www.downtoearth.org.in/node/16128

   http://newindianexpress.com/states/kerala/article167591.ece

   http://www.mathrubhumi.com/english/story.php?id=23886

4) **Acknowledgements**
   Theeram Prakriti Samrakshana Samiti, Kolavipalam; President – MJ Suresh Babu

12. Kumbalangi- the Waterfront Village

Kumbalangi is surrounded by backwaters and encircled by a ring of Chinese fishing nets. The village which has an area of 16 sq km, has a population of about 35000, consisting of fishermen, farmers, toddy tappers, coir spinners and labourers. In 2003, a tourism project was initiated in Kumbalangi to help the local people and the economy. Discarding the usual ideas of tourism, the project aimed at creating job opportunities for the local people while ensuring a good village experience for tourists. Instead of developing hotels, the project initiated home stays – now about 20 houses offer home stay arrangements at a reasonable cost. Tourists eat the food prepared in the households, walk through the village, go canoeing, go fishing, watch coir processing and all such village activities. The boatmen, who were being side-lined due to good road connectivity with the city, have seen a revival of their trade as tourists love the cruises in the backwaters. As part of the project, the villagers have ensured that the rich biodiversity of the area is protected. The backwaters have a rich aquatic life and the land and water are separated by mangroves which were planted to regenerate lost plantations – 50000 mangrove saplings have been planted as part of this project. Another practice that is being reintroduced here is the Pokkali farming – the farming of rice and fish/prawns alternately through the year. Thus an eco-friendly tourism project is enabling the revival of unique farming practice as well as ensuring the conservation of marine biodiversity.

Title: KUMBALANGI – THE WATERFRONT VILLAGE

Author(s): Ms. G. Padma, Programme Coordinator, CEE Kannur Field Office

Name of the State and study Location: Kerala, Kumbalangi

Objective of the initiative/ project: To help the local people, the village economy and the locality through tourism

Implementers: Kumbalangi Panchayat

Dates: 2003 onwards

1. Background information

General:

- **Details on the location/ geographical dimensions**
  A small island-village on the outskirts of Kochi
- **Kind of resource management, livelihood practices**
  Fishing, farming, coir making, toddy tapping, unskilled labour – these are the major livelihoods in the village
- **History: use of resources/ cultural practices / key events and projects**
  Being a small island surrounded by backwaters, most people go to the city for finding employment, especially as skilled and unskilled labourers. Fishing was a major occupation and many people made their living through it. In 2003, the then Minister of Tourism, Kerala offered the Panchayat the integrated village tourism project, which changed the image of Kumbalangi.

Conditions:

- **Climatic, geographical, ecological, socio-economic, demographic, cultural context**
  Kumbalangi has a tropical monsoon climate and remains humid throughout the year. It receives rains from both the southwest and northeast monsoons. Being surrounded by backwaters, the heat is reduced but the humidity is high. It is a small island on the outskirts of Kochi and is surrounded by backwaters. The bulk of the population numbering about 35000, is involved in fishing, farming, toddy tapping, coir making and skilled and unskilled labour. Most of them go to the city to find employment as labourers or others. The village has several temples, churches and mosques and festivals are an important part of the cultural context in the village
- **Natural hazards and recent disasters in the area**
  The last monsoon had brought in very heavy rainfall during June-September all over Kerala, including Kumbalangi. This had led to loss of crops and related damage.

- **Climate change vulnerability information for the area, if available**
  The Panchayat President and others observe loss of species and changes in the backwaters, but do not relate it to climate change.

Coastal and marine biodiversity:

- **Brief on the habitat, species and genetic diversity present in the area**
  The biodiversity of the village and the surrounding area have not been documented so far. But the citizens do mention that some varieties of fish that they used to see and eat earlier are missing now, pointing to some loss. Different species of fish, crab and shrimp are found in the backwaters. The mangrove vegetation in the village was being destroyed, but with the realisation that this is affecting the survival of fish species, the people have initiated protection measures. More than 50000 mangrove saplings have been planted and are being looked after. The rodents, insects, birds, and other species are as commonly found in the region.

2. General description of project / initiative / effort

- **Purpose / objectives**
  To bring in development and economic rejuvenation in the village; to provide the villagers with new livelihood options through tourism
- **Implementing entity / partners**
  Kumbalangi Panchayat, in partnership with the Tourism Department of Kerala
- **Project / initiative duration**
  The project is ongoing since 2003.

3. Process of implementation

- **Actors: Who is involved in the process?**
  The Panchayat of Kumbalangi is the main player along with Tourism and 16 other departments.
- **Tools: What implementation tools/ techniques have been used?**
  In contrast to the usual tourism model where the infrastructure and facilities providers gain, the Panchayat has opted for a participatory approach by which the local villagers gain as they are the facilities providers. Another important approach is the integrated development approach in which the schemes and programmes of several departments (eg horticulture, agriculture, sanitation, fisheries, culture, industry, etc.) have been implemented in a manner that a large number of the population benefit by them.
- **How the participatory approach used? What communities were involved in the process? In what ways?**
  The main communities of the village like fishermen, boatmen, farmers, coir and coconut workers have all been involved in the tourism project. Local handicrafts have been developed – like coconut shell crafts and banana fibre products. One of the main benefactors have been people who have registered for home stay, setting aside one or two rooms with basic facilities for tourists who can enjoy the village ambience, life and food.
- **How are communities affected by the initiative (positively/negatively)?**
  Overall, in the view of the Panchayat, the communities have been benefited positively. Many projects have been brought in as part of the tourism project. Cultural activities have received a boost, especially Kerala cuisine and marine food. An interesting effect of the home stay initiative has been that many senior citizens who were staying alone now rent one or two rooms to tourists, thereby ensuring company throughout the year, earning an income and treating the visitors to Kerala hospitality in return.
- **Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved?**
  The Panchayat President who the author discussed the project with, did not mention any particular controversy related to the project.
- **What particular success/ difficulties did the implementation met with?**
  The main successes have been the home stay initiative (about 20 registered home stays are available), marine cuisine (when ships dock in Kochi, large numbers of tourists flock to Kumbalangi to enjoy the local cuisine and spend time on the banks of the backwaters), waste management initiatives (over the years about 2000 biogas plants have been implemented in the households, retreats, etc.), building of roads (ongoing), boat cruises (groups of tourists are often welcomed at the entrance to the village and taken to their home stay/retreat by

boats) and cultural practices (cultural programmes and demo of local industries like Chinese fishing, coir making, coconut leaves weaving, toddy tapping are organised for tourist groups on demand). Two major difficulties mentioned by the Panchayat President and a prominent citizen of the village were (a) the reluctance of the local people to agree to acquisition of land for constructing roads – roads are very narrow and difficult to manoeuvre around; and (b) the slow development of pokkali farming technique (alternate farming of rice and shrimp) due to reluctance and climate factors among the people.

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- **biodiversity conservation**
  Conservation of mangroves and fish species, local flower species (orchids) have got a boost with this project
- **livelihood security and sustainability**
  The initiatives described above (last point under Item 3) have provided newer avenues of livelihood coupled with several other related projects coming up in the village due to the enthusiasm of the local Panchayat. The initiatives have sustained over 10 years and the authorities are confident that they will remain so.
- **Influencing policies/ decisions at a broader scale**
  Kumbalangi is the first model village tourism project in Kerala/India and has also become a good example for 'responsible tourism'. Instead of destroying nature in the name of tourism, this village has been able to conserve nature while also developing its tourism potential.
- **Changes in the perception of local communities towards conservation (How the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?)**
  As already mentioned, it is in the interests of the communities to conserve the biodiversity since the tourist potential is also based on its conservation. Fish and related species being the main attraction along with natural beauty, there is a stake for protecting them. There is greater awareness as well as initiatives to protect the biodiversity in order to secure their livelihoods.
- **Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation**
  Possible, since there are more projects being sanctioned to the Panchayat – an indication that decision makers are taking note.
- **Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation?**
  The project is ongoing.

5. Discussion

- **What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.**
  The idea of integrated village tourism was nascent when Kumbalangi initiative commenced. Being the first of its kind, there was enthusiasm to make it work. The triggering factors include: governance (Department Minister, local representative implementing policy measures); capacity development (for home stay owners, craftspeople, Panchayat members); partnerships (about 16 departments converging to provide projects); institutional mechanisms (formation of Kumbalangi Tourist Development Corporation); resource needs (lack of employment opportunities due to slightly isolated island village and outmigration to city).
- **Sustainability: What is needed to maximize results and achieve sustainability?**
  More focus on development of small and micro industries, crafts, awareness creation, roads and other infrastructure facilities
- **Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?)**
  Yes, the process can be replicated fairly well. Common facilities like toilets, better roads, signage, volunteers, information kiosk, hoardings with information on boat availability &

timings, publications related to the activities – these are some of the factors that need to be augmented for better replication.

- **Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations**
  There is no cost benefit analysis or economic valuations available. In broad terms, the employment/income generating activities have increased and conversely, infrastructure development has also taken place (roads, biogas plants)
- **If possible, compare to alternative solutions, i.e. the interventions without a participatory approach**
  Without participatory approach, such a project would have ended up making Kumbalangi a regular tourist spot, where the beneficiaries would be hoteliers, resort owners etc. leading to outflow of finance rather than inflow of income. Land value would have increased due to such incursions leading to locals being pressurised into selling their properties. Resorts would lead to destruction of biodiversity rather than conservation. An examples would be Kovalam Beach where the local people are witnesses to the developments taking place rather than participants, except as small traders, restaurateurs, etc.

6. Recommendations / Conclusions

- **Summarize key lessons learned and priority areas of action**
  Tourism is a major contributor to the local development if channelized in such a way that the benefits are shared with the local population. For initiatives like Kumbalangi, there is a need for political will – in this case a Minister belonging to the village had initiated the project. There has to be a mechanism whereby places suitable for 'responsible tourism' can be identified and the local population roped in to provide facilities and amenities, so that the economic development of the region is assured. Dependence on one person is not a sustainable way of bringing in development.
  On the other hand, it is commendable that the Panchayat made use of this opportunity to ensure the people's involvement and development by bringing in and converging programmes from various departments. Home stays and day time activities (fishing, farming, enjoying the cuisine, boat cruise) are very popular and have become a major money earner. An interesting fallout has been the senior citizens' involvement in home stay which provides them company, occupation and income almost throughout the year.
- **Could also include forward-looking reflections, next steps and or immediate follow-up activities**
  What seems missing as of now, is the focus on crafts – due to a gap of about five years, there have not been much of new crafts projects being taken up. Roads too need development urgently as they are quite narrow and difficult to manoeuvre. Immediate steps that the Panchayat needs to take are preparing a Biodiversity Register of the village with the help of the Biodiversity Board, as this will give an idea of the status of biodiversity conservation and directions for future.

Annexes

1. **Photos, satellite images, maps, graphs and other visuals**
2. **Statistics**
   Area of Kumbalangi: 16 sq km
   Population: 35000 (approx.)
   Occupation: fishing, farming, toddy tapping, coir spinning, skilled and unskilled labour
   No of registered home stays: 20
   No of Chinese fishing nets: 50
   Upcoming (possibly): A floating resort
   Fund sources: Government departments, MP funds, MLA funds, Panchayat funds
3. **Related links**
   http://kumbalangy.com
4. **Related publications**
5. **Acknowledgements**
   Ms Usha, President, Kumbalangi Panchayat President
   Mr N N Sugunapalan, Senior Advocate, Kerala High Court & Resident of Kumbalangi

13. Vembanad Socio Ecological System (SES)

Vembanad Socio Ecological System (SES) comprises of backwaters, lagoons, marshes, mangroves, network of natural and manmade canals and reclaimed land. More than 1.5 million people are directly dependent on this SES. It is also an important birding area. Hence the Vembanad SES and its adjoining *kol* has been declared a Ramsar site.

With four rivers draining into it and saline water mixing during tides, the wetland is a haven for both marine and fresh water fishes with more than 75000 families dependent on fish catch for their livelihood. During 19th and 20th centuries, land was reclaimed for below sea level paddy cultivation in the Kuttanad area, to protect which a salt water barrier – Thannermukkam Bund – was also constructed. Since the bund was closed most of the summer, the lake suffered from lack of flushing with saline water. Compounded to this was the accumulation of agro-chemical effluents from the surrounding farms and sewage from nearby towns which made the lake a veritable pollution sink. The lake soon became overgrown with water hyacinth which prevented boats from moving freely as well as causing siltation. Moreover, the construction of the bund led to conflicts between farmers and fishermen.

Added to this, National Geographic listed Kerala as one of '50 destinations of a lifetime', which led to Vembanad becoming a hectic backwater tourism spot. The banks of the lake which were used by the fishing community for their livelihood activities became a favourite spot for tourist resorts which prevented the community from accessing the banks and thus endangering their livelihoods.

At this time ATREE initiated its Vembanad Wetlands Conservation Programme and established the Community Environmental Resource Centre to engage the people in conserving the lake. A Lake Protection Forum (LPF) was formed in Muhamma which was followed by 12 more, with 50 members each, and combined to form a federation.

The flagship campaign of the LDFs is the setting up of *mathsyathavalams* or fish sanctuaries by adapting the *padal* method of fishing to make it a protected area for fishes. The *padal* method of fishing is one in which an artificial reef is made by planting twigs and leaves in shallow areas and harvest the fish that shelters there for feeding and breeding. The Dept of Fisheries has banned this type of fishing.

The LPFs modified this method and created these reefs in safe places so that it would provide the fish a safe habitat for breeding. Accordingly, the *padals* are fixed to the lake floor and a bamboo fencing provided to prevent other fishermen entering the area. These were declared as *mathsyathavalams* or fish sanctuaries and non-fishing zones, with the LPF members keeping vigil to prevent fishing in the area. Each fish sanctuary would measure about 20 cents in area. An independent evaluation by fishery experts "this conservation intervention based on the traditional ecological knowledge is helping in sustaining the lake ecology, its biodiversity and contributing to the sustenance of livelihood of local fisher folk."

The LPFs also now carry out several other activities: published a booklet to educate the communities on the ethicalities of fishing; undertake a plastic removal campaign every year during the Sabarimala pilgrim season and use it in the construction of village roads; set up a water quality monitoring system called *Jaladarpanam* on a participatory basis by training volunteers from the community, with eight basin stations already established; celebrate World Wetland Day with a view to create awareness in stakeholders; and revived traditional rituals that aid conservation of fishing resources.

Title: VEMBANAD – LAKE PROTECTION FORUMS

Author(s): Ms. G. Padma, Programme Coordinator, CEE Kannur Field Office

Name of the State and study Location: Kerala, Vembanad Lake

Objective of the initiative/ project: To conserve the marine and freshwater fish resources of the lake for securing the livelihoods of the fisher folk

Implementers: Members of the Lake Protection Forums; Community members; Ashoka Trust for Research in Ecology and the Environment, Alappuzha (ATREE) and its initiative Community Environmental Resource Centre (CERC)

Dates: Around mid 2000 onwards

1. Background information

General:

- **Details on the location/ geographical dimensions**
  Vembanad Lake and its surroundings, Alappuzha District
- **Kind of resource management, livelihood practices**
  Fishing, conservation of fish through establishment of fish breeding sanctuaries
- **History: use of resources/ cultural practices / key events and projects**
  The fishermen

Conditions:

- **Climatic, geographical, ecological, socio-economic, demographic, cultural context**
  Vembanad has a monsoon climate as in Kerala. The predominant occupation is fishing which is now regulated by the fisher folk themselves.
- **Natural hazards and recent disasters in the area**
  No information available
- **Climate change vulnerability information for the area, if available**
  No information available

Coastal and marine biodiversity:

- **Brief on the habitat, species and genetic diversity present in the area**
  Vembanad Wetlands has a rich biodiversity which includes 185 species of birds, 79 species of fish, 18 species of reptiles and 189 species of plants and trees.

General description of project / initiative / effort

- **Purpose / objectives**
  To prevent destruction of fish species, due to pollution caused by increased tourist related activity
- **Implementing entity / partners**
  Lake Protection Forums (LPFs) initiated by CERC-ATREE, Federation of LPFs, local community members
- **Project / initiative duration**
  Since mid 2000's

2. Process of implementation

- **Actors: Who is involved in the process?**
  The fishermen of Vembanad, the farmers of Kuttanad,
- **Tools: What implementation tools/ techniques have been used?**
  Community based conservation measures using traditional and natural means – setting up of *matsyathavalams* or traditional fish sanctuaries
- **How the participatory approach used? What communities were involved in the process? In what ways?**
  When faced with declining fish resources in Vembanad Lake due to pollution caused by various activities – including increased tourist activity and Sabarimala pilgrimage activity – ATREE started a Vembanad Wetland Conservation Programme and established the CERC to engage the local communities in it. With the technical support of ATREE-CERC, the first LPF was formed, followed by more LPFs by village collectives. Each LPF consisted of 50 community members of which at least 40% are women. There are 13 such LPFs around Vembanad now. People from the fisher folk and local communities are involved in this participatory approach.
- **How are communities affected by the initiative (positively/negatively)?**
  The communities have been able to prevent unregulated tourist activity and fishing in the area as a measure of protecting and reviving fish resources, especially during the breeding seasons. This has also improved their livelihood prospects in a very positive way.

- **Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved?**
  There was not much controversy as the local communities were already concerned about the heavy pollution of the lake leading to fast depleting catch, increased tourist activity and consequent alienation from their source of income. The means they chose to protect the biodiversity was a non-intrusive one, in which they adapted a traditional but banned fishing method – *padal* – to protect the breeding fishes.
- **What particular success/ difficulties did the implementation met with?**
  The implementation succeeded in increasing the fish resources in the lake and therefore the biodiversity surrounding the lake. Fishermen's livelihoods have been protected because of this. Besides, the LPFs have also initiated other activities to conserve the lake, remove pollution, create awareness in the communities about the importance of wetlands, and regulate fishing as well as tourism in a large measure.

3. Outputs and Outcomes

- What was achieved (or not) in practical terms, with regard to the following:

- **biodiversity conservation**
  The fish species of the lake have seen a revival and they are protected during their breeding season.
- **livelihood security and sustainability**
  The protection of the fish species has given an impetus to the livelihoods of the fishermen.
- **Influencing policies/ decisions at a broader scale**
  Though probably not influencing policies, the Federation of LPFs has initiated efforts to resolve conflicts between the fishermen and the Kuttanad farmers.
- **Changes in the perception of local communities towards conservation (How the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?)**
  The local communities were already concerned about the declining biodiversity in the lake. More than 75000 families were directly dependent on the fishery resources. Hence the importance of biodiversity for their livelihood security was evident to them. The formation of LPFs was useful since they benefited in terms of better fish catch.
- **Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation**
  The efforts of ATREE-CERC have been noticed by the policy makers and scientific community as having played a pivotal role in protecting the Vembanad wetlands.
- **Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation?**
  The initiative is on-going.

[use examples, direct quotes from local community/ officials/ development workers/etc, indicators, etc to provide clear evidence of results / impacts]

4. Discussion

- **What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.**
  The fish sanctuaries set up by the LPFs is a success. The trigger factors have been the pollution and shrinkage of the lake due to tourism and other activities which endangered the livelihoods of the fishermen. The local population was also concerned about the state of the wetland especially due to the pollution due to the Thanneermukkam Bund that was constructed to enable farming in Kuttanad. This had prevented the tidal flushing leading to heavy pollution. With tourism increasing exponentially after Kerala and its lakes were highlighted in National Geographic magazine, the fish reserves were in danger due to the large number of houseboats operating in the lake and worsening the pollution. The time was therefore ripe for such an action as setting up fish sanctuaries to protect the resources. The initiative is more of a grassroots movement than a policy implementation.

- **Sustainability: What is needed to maximize results and achieve sustainability?**
  Support from government and regulation of tourism – especially resorts and houseboats
- **Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?)**
  Yes. The main factor that needs to be taken into account to allow replication is creating awareness among local people and engaging them in all efforts at conservation, and also providing them an institutional mechanism for the same.
- **Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations**
  While no cost benefit analysis has been undertaken, the fish sanctuaries have been able to protect fishery resources leading to livelihood security in the community.
- **If possible, compare to alternative solutions, i.e. the interventions without a participatory approach**
  Not enough information available
- **If possible, compare to similar initiatives implemented in other settings**
  Not enough information available

5. Recommendations / Conclusions

- **Summarize key lessons learned and priority areas of action**
  When various activities combine to endanger livelihoods, the collective action of the local communities can ensure the conservation of their source of income. The community members formed LPFs to ensure the survival of breeding fishes as well as regulation of fishing. An important factor in this has also been the creativity of the local communities which had made them adapt a traditional but destructive method of fishing to protect the fish.

  The initiative helped conserve fish and protect the livelihoods of the people. But there are also additional benefits. The LPFs have not stopped at this but have initiated various campaigns to protect the Vembanad wetland, prominent among them being: educating the communities on the ethicalities of fishing, plastic cleaning campaign (especially during the Sabarimala pilgrim season) and using it for village roads, reviving traditional rituals for conservation, etc. The federation of LPFs has also been working to resolve conflicts between fishermen and farmers as both groups share the same wetland for their activities.
- **Could also include forward-looking reflections, next steps and or immediate follow-up activities**
  Cleaning up the wetland seems to be of prime importance for the health of the biodiversity and the livelihoods of the people. One aspect that can be dealt with through policy initiatives is that of regulating plastic use by the pilgrims who visit Sabarimala during the peak season. Though it may not be possible to ban plastic drinking water bottles (the government itself is supplying these), it is possible to ensure that the plastic is collected at the bottom of the hill itself and recycled (the government can set up a recycling plant) so that it is not dumped in the Pampa river and travel onwards to Vembanad lake. The second aspect would be the regulation of tourist activity around the lake, especially strict norms for construction of resorts around it, since this has shown to have the potential to alienate the community from their source of daily income.

Annexes

1. **Photos, satellite images, maps, graphs and other visuals**
2. **Related publications**

- *Lake Protection Forum: A Bottom-up Approach for Conservation and Sustainable Use of the Heavily Used Vembanad Socio- Ecological* – K M Poovu, Ashish Mathew George, Jojo T D, Priyadarshan Dharma Rajan
- *Padal Fishing: A unique fishing method in the Ashtamudi estuary of Kerala (South India)* – I V George & B M Kurup
- Discussions with Mr Priyadarshan Dharma Rajan on the topic

Fish sanctuary on Vembanad Lake & Sign board declaring it as a non-fishing zone

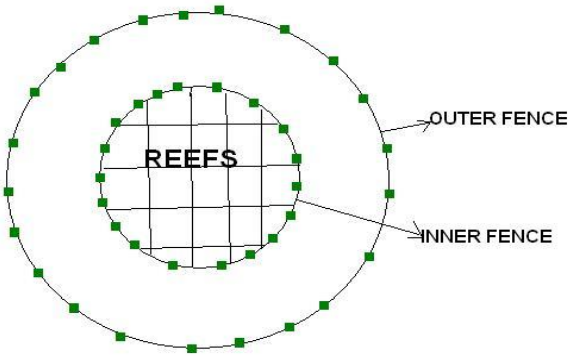


DIAGRAM OF FISH SANCTUARY

14. Perumbalam – Fight Against Dredging

Perumbalam on Vembanad Wetland (a Ramsar site) has been a site of resistance by fishers against the deep dredging that is being undertaken by industries like Travancore Cements Ltd. The local fisher folk have been harvesting as much clam as required by them. Because of the black clams being a raw material for several industries in the region, the Mining and Geology Department of Kerala labelled them as a mineral resource, leading to a situation where fishermen had to get a license to harvest them. The industries bring in huge dredgers and mine out the fossilised white clam deposits which lead to depletion of clams in the area, affecting the livelihoods of the people. The local people also believe that dredging will affect the other biological lives in the area. An expert committee was constituted to to conduct studies of the impact of dredging on the deposits but the local people have refused to allow trial dredging for this. The Cement company had to lay off their workers in view of the reduced raw material available for production, rendering them jobless. The fisher folk on the other hand refuse to let the dredgers in and often surround the dredgers in their boats making it impossible to carry on the mining. Considering the degradation happening in Vembanad Lake, no scientific study has been undertaken to look into the clam situation.

The media also played a role as a fellowship awardee of Centre for Science and Environment (CSE) wrote a series of articles in which the Perumbalam situation was also highlighted. This led to a study to be undertaken by the Fisheries Department.

Title: PERUMBALAM – FIGHT AGAINST DREDGING

Author(s): Ms. G. Padma, Programme Coordinator, CEE Kannur Field Office

Name of the State and study Location: Kerala, Perumbalam

Objective of the initiative/ project: To conserve the clam deposits in the area for securing the livelihoods of the people

Implementers: Traditional fishers

Dates: 2005 onwards

1. Background information

General:

- **Details on the location/ geographical dimensions**
  Perumbalam on Vembanad Lake
- **Kind of resource management, livelihood practices**
  Fishing, clam fishing
- **History: use of resources/ cultural practices / key events and projects**
  The fishermen had been harvesting the clams from the lake in Perumbalam for their livelihood until the Mining and Geology Department declared it as a mineral resource and prevented them from collecting clams. Ever since the

Conditions:

- **Climatic, geographical, ecological, socio-economic, demographic, cultural context**
  Perumbalam has a monsoon climate as in Kerala. The predominant occupation is fishing and clam harvesting which is regulated by the fisher folk themselves.
- **Natural hazards and recent disasters in the area**
  No information available
- **Climate change vulnerability information for the area, if available**
  No information available

Coastal and marine biodiversity:

- **Brief on the habitat, species and genetic diversity present in the area**
  Vembanad Wetlands has a rich biodiversity which includes 185 species of birds, 79 species of fish, 18 species of reptiles and 189 species of plants and trees. Perumbalam itself is famous for its black and white clams.

2. General description of project / initiative / effort

- **Purpose / objectives**
  To prevent destruction of species, especially clams, through dredging for mining the fossilised clam deposits
- **Implementing entity / partners**
  The people of Perumbalam/The Anti Dredging Agitation Committee
- **Project / initiative duration**
  This agitation is going on since 2005.

3. Process of implementation

- **Actors: Who is involved in the process?**
  The fishermen of Perumbalam; journalists – specifically a reporter from New Indian Express who wrote a series of articles as part of her fellowship with CSE
- **Tools: What implementation tools/ techniques have been used?**
  Agitational methods like surrounding the dredgers when they enter the waters.
- **How the participatory approach used? What communities were involved in the process? In what ways?**
  The people involved have formed an Anti-Dredging Agitation Committee which includes the clam harvesting fishermen as well as those who are concerned about the effect dredging would have on the other species.

- **How are communities affected by the initiative (positively/negatively)?**
  The community has been able to prevent dredging in the waters in Perumbalam, while the workers in the nearby cement factory had to face layoffs, rendering them jobless.
- **Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved?**
  There is a lot of controversy generated by this move. The cement factory may have to be closed if the agitation continues. The fishermen suggest that they should find alternate raw material for their product. The company contends that they have dredged in other areas in Alappuzha and no negative impacts have been felt. The problem is still ongoing.
- **What particular success/ difficulties did the implementation met with?**
  The issue is still alive and the agitation cannot be called a success or a failure. The fishermen have stuck to their stand of not allowing dredging while the company is likely to face problems with production.

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- **biodiversity conservation**
  The clam deposits of the region have been protected.
- **livelihood security and sustainability**
  The agitation is undertaken to protect the livelihood security of the people and the sustainability of clam harvesting. As of now, since dredging is not allowed, the deposits are being protected.
- **Influencing policies/ decisions at a broader scale**
  With the media also taking up the issue, it has had an impact on policies and decisions at a broader scale. The department has set up an expert committee to study the impact of dredging but the local people have not been cooperative. No decisions have been taken yet.
- **Changes in the perception of local communities towards conservation (How the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?)**
  The perception of the local communities has been that the biodiversity should be conserved since it is the source of their livelihood.
- **Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation**
  Action has been taken by departments in setting up an expert committee but no resolution has been reached. The predominant feeling in the decision makers and some of scientific community is that this move has affected the industrialisation of the area.
- **Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation?**
  The agitation is ongoing.

5. Discussion

- **What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.**
  The agitation has worked though there is also the other side that the industrialisation (particularly the cement factory) is affected. The triggering factors for the agitation were: (a) governance (the clam deposits were labelled mineral resource forcing the fishermen to get a license for harvesting them); (b)partnerships and institutional mechanisms (the issue received a boost when journalists intervened and highlighted the problems with a prominent leaning towards biodiversity conservation); and (c) resource needs (as the clam harvesting is the source of their livelihood).
- **Sustainability: What is needed to maximize results and achieve sustainability?** NA
- **Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?)** Yes, where such

mindless destruction takes place. But there needs to be a balance between development and biodiversity conservation, especially a stand for sustainable use of a resource.

- **Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations. There** is no cost benefit analysis or economic valuations undertaken, but for the cement factory, the loss has been running into several crores.
- **If possible, compare to alternative solutions, i.e. the interventions without a participatory approach** Not enough information available
- **If possible, compare to similar initiatives implemented in other settings**

6. Recommendations / Conclusions

- **Summarize key lessons learned and priority areas of action**
  Sustainable use of resource is important for development but when resource utilisation is done without concern for those whose livelihood is dependent on the same resource, there is definitely scope for agitations as happened in Perumbalam. The decision makers need to strike a balance between development needs/industrialisation on one hand and livelihoods of local people and biodiversity conservation on the other. Besides, often decisions are taken without consulting the people affected, which also acts as a trigger for resistance moves.

  If people are to be convinced of the need for dredging, scientific studies need to be undertaken. More importantly, a broader outlook that includes the rights and needs of traditional workers, livelihoods, and developmental needs is required on the part of decision makers.
- **Could also include forward-looking reflections, next steps and or immediate follow-up activities**
  There is an urgent need for both parties to sit across the table and understand each other's concerns in order to resolve the issue. The option of identifying alternate mineral resource for white cement production, as also the option of finding an alternate process to mine the clam deposits from the deep should be explored.

A***nnexes***

1) **Photos, satellite images, maps, graphs and other visuals**
2) **Related publications**
   - Articles in Malayala Manorama dated 2005 and 2010
   - Strangling the Goose that Lays Golden Eggs – Reema Narendran (Article in New Indian Express, March 18, 2010, Kochi edition)
   - Development policies, state interventions and struggle for livelihood rights:
   - A study of coastal communities in Kerala, India (Paper by K T Thomson)

TAMILNADU

15. Co-management of fisheries resources in Palk Bay

In Tamil Nadu two categories (a) traditional (or) artisanal (b) mechanized are often seem as antagonistic grouping fighting for access to the limited fishing resources. The artisanal sector can also be characterized as 'village based' or 'community based fisheries with local village organizations setting the rules governing the fishing operations and having considerable power over the fishing unit.

In Palk Bay, there is the interesting 'three day – four day' rule which the government and the communities have agreed upon, which predates the MFRA. Because the gill netters and trawlers cannot coexist at the same time, instead of day – night division, it is 3 days for trawlers and 4 days for gillnetters.

Title:

Co-management of fisheries resources in Palk Bay

Author(s):

Ms. S. Rejini, Programme Officer, CEE TN

Name of the State and study Location:

Tamil Nadu, Palk Bay

Objective of the initiative/ project:

Community based fisheries and habitat management

Implementers:

Department of Fisheries (DoF), Fishermen Associations

Dates:

1. **Background information**

General:

- Details on the location/ geographical dimensions
    - Bay, a sheltered shallow bay between India and Sri Lanka with a coast length of about 350 km.
    - It is studded at its southern end with a chain of low islands and reef shoals that are collectively called Adam's Bridge. This chain extends between Dhanushkoid on Pamban Island (also known as Rameswaram Island) in Tamil Nadu and Mannar Island in Sri Lanka. The island of Rameswaram is linked to the Indian mainland by the Pamban Bridge.
- Kind of resource management, livelihood practices
    - Palk Bay coasts of southeast India are home to luxuriant sea grass beds. These are important feeding ground for endangered marine mammals like dugongs.
    - In addition, thousands of fisher folk depend on the fishery resources associated with these seagrass beds for their livelihoods.
    - However destructive fishing practices, like the use of bottom trawling, as well as the discharge of untreated sewage, are some of the major causes of seagrass destruction in Palk Bay.
- History: use of resources/ cultural practices / key events and projects
- Use of Resources

    - Fishery resources in the Palk Bay region have been the source of livelihood to fishers in South India and North Sri Lanka who have fished in harmony with each other since ancient times. Once the maritime boundary between the two countries was settled in the mid-1970s, fishing on each side of the Bay was limited to fishers of the respective country.
- Cultural Practices and Key events:
    - The Palk Strait which lies between Tamil Nadu and Sri Lankan land masses, is seen as a divider, separating two different distinct ethnicities, religions, cultures and political entities. But there was a phase in history, between the early years of the Christian era and the 14th century, when Tamil Nadu and Sri Lanka enjoyed very close ties.
    - From ancient times till the late 1960s fishing in the Bay region was confined to finfish and chank resources. Both Sir Lankan and Indian Fishers were using traditional craft.
    - 1960s the potential of shrimp resources in the area for earning foreign exchange was recognized and since then both groups focused more on shrimp resources. Shrimp was harvested by bottom trawling and the number of motorized trawlers fishing in the area gradually increased.
    - No of motorized crafts started increasing from 2001 onwards.

Conditions:

- climatic, geographical, ecological, socio-economic, demographic, cultural context
    - Dry tropical climate with low humidity, with average monthly rainfall of 75.73 mm, mostly from North East monsoon from October to January. The highest ever temperature recorded at Pamban station was 37 °C and the lowest was 17 °C
    - The Palk Bay (named after Robert Palk, Governor of Madras Presidency from 1755 to 1763) is the sea area, which is bounded on the north and west by the coastline of the State of Tamil Nadu in India, on the south by the Pamban island of India, the Adam's or Rama Bridge (a chain of shoals) and Mannar island of Sri Lanka, and on the east by the northeast coastline and the Jaffna peninsula of Sri Lanka. The Bay is 137 km in length and 64 – 137 km in width. Although it is commonly referred to as Palk Bay, it is not typically a bay, but a straight, which connects the Bay of Bengal to the northeast with the Gulf of Mannar to the south. The northern part of the Bay that opens to the Bay of Bengal is called Palk Straight.
    - Palk Bay has its own peculiarities leading to the evolution of distinctive artisanal fisheries and identities.
    - Along the coast in the Gulf of Mannar and the Palk Bay there are 138 villages and towns spread over 5 districts. The socio-economic profile of the fishermen in the villages of Gulf of Mannar coast is low, and more than 40% of families are in debt.
    - According to the 2011 census, the taluk of Rameswaram had a population of 82,682 with 41,995 males and 40,687 females. There were 969 women for every 1000 men. The taluk had a literacy rate of 75.51. Child population in the age group below 6 was 4,561 Males and 4,406 Females.
- Natural hazards and recent disasters in the area.
    - Palk Bay is an area of intense geo-tectonic and cyclonic activities. The GSI has classified it as Zone II. Between 1891 and 2001, 64 cyclones have hit the Tamil Nadu coast, out of which 36 where severe. In December 1964, one of those cyclones even washed away the Pamban Bridge.
    - Climate change vulnerability information for the area, if available

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area
    - Rare and endangered species of sea turtle, dolphin, sea cow and whale are recorded in the Palk Bay. The sea cow inhabitants the shallow shore regions where grasses occur. Several species of green algae, brown algae, red algae, blue green algae and sea grasses are recorded in the Palk Bay.
    - Most of the habitats of the sensitive biota, viz., corals, pearl oysters, chanks, sea cow, holothurians and marine algae are along the coast.

2. General description of project / initiative / effort

- Fisheries Sector makes a positive contribution to Sustainable Development (SD)
    - Resource Sustainability and enhancement, Ecosystem sustainability, Social and Economic Empowerment, Ensure better and sustainable livelihood.
- Implementing entity / partners: Government, Community of fishery resource users, NGOs and other stakeholders (boat owners, fish traders).

3. Process of implementation

- 'Three day – Four day' rule at Palk Bay has been agreed by the government and the communities, which predates the Marine Fisheries Regulation Act (MFRA). The gill netters and the trawlers cannot coexist at the same time, instead of day – night division; it is 3 days for trawlers and 4 days for gillnetters.
- Serious internal divisions within community that have cropped up due to state interventions; deeply divided between "mechanised" and "traditional" fishing or between major gear groups; caste and religious differences in certain areas.
- The trawler fisher associations of Ramnad agreed with artisanal fishing organizations and local government authorities to a system whereby trawlers would fish three days a week, leaving four days to artisanal fishers. This is monitored partly though a system of monthly meeting, in which the District Collector gathers the representative to observe.

4. Outputs and Outcomes

- biodiversity conservation
- livelihood security and sustainability
- Influencing policies/ decisions at a broader scale
- Comprehensive approach to empowerment of coastal communities through co-management.
- Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation
- Partnership between government and local communities resulting in collaborative management (co management) which is mainstreamed as a part of government administration is seen as the mechanism to achieve sustainability in fisheries.
- Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation? On going

5. Discussion

- Self-Governing nature of fishing villages worked in arriving at decisions.
- Every fishing village is a self-governing entity in all aspects. This even includes control over who they vote for in the general elections. The Hindu community is closely knit and the extent to which their traditions exists is seen to be inversely proportion to the distance form Chennai. The Christian fishers are generally governed by the Church (under the control of the parish councils or church committees.)
- Sustainability: What is needed to maximize results and achieve sustainability?
    - Need for three parties to work together – Government, Civil Society and fishing community.
- Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?)
    - Yes; Creation of higher level platforms of fisher organisations that can address issues across longer stretches of the coast and get into co – management arrangements with Government.

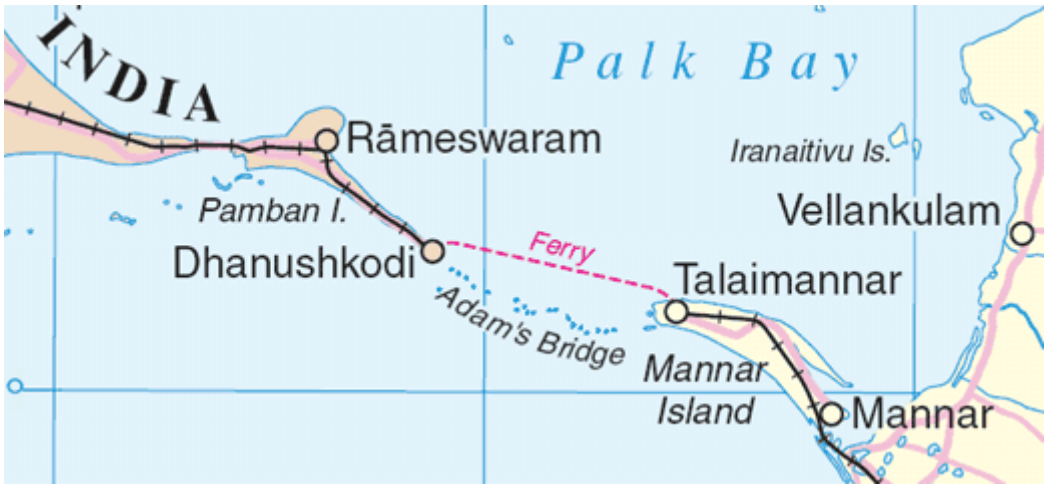
6. Recommendations / Conclusions

- Summarize key lessons learned and priority areas of action
    - Though local level s of Government in India are aware of the fishing community CBOs, Government is 'officially blind' to these organisations.
    - While village institutions are strong, the supra level organisations essential for resource management to be effective across a coast line are weak or withered away. Serious internal divisions within community that have cropped up due to state interventions; deeply divided between 'mechanised' and 'traditional' fishing.

- Could also include forward-looking reflections, next steps and or immediate follow-up activities
    - Changes needed for successful Community Co management
    - State recognition of traditional and self-formed organisations of fishing communities,
    - Willingness of Government to work with fishing communities in a equal partnership and acceptance of co management concept.
    - Changes in laws that will facilitate transfer of power of community organisations.

Annexes

1) Photos, satellite images, maps, graphs and other visuals



2) Statistics
3) Related links

https://sites.google.com/site/fimsul/home/work-packages/wp5
cmsdata.iucn.org/downloads/india_feedback_from__workshop_i.pdf
http://community.icsf.net/en/samudra/detail/EN/672.html

Contacts:

Fisheries Department, Collectorate Complex, Ramnad Phone: 04567 - 230355

16. Sea cucumber conservation in Gulf of Mannar

Author(s): Ms. Rejini Simpson, CEE and Adapted from publications of authors Dr. P.S.B.R. James and Dr. D.B. James, Central Marine Fisheries Research Institute, Technical Research Centre (TRC) of CMFRI, 90 North Beach Road, Tuticorin 628 001

Name of the State and study Location:

Tamil Nadu, Gulf of Mannar (GoM)

Objective of the initiative/ project:

- To review the status of sea cucumber stocks
- To conserve and Manage Sea cucumber stock
- To give support of sustainable exploitation of sea cucumbers

Implementers:

Central Marine Fisheries Research Institute (CMFRI)

Mandapam Regional Centre of CMFRI

Technical Research Centre (TRC) of CMFRI, Tuticorin

Dates:

From 1989

1. Background information

General:

- Details on the location/ geographical dimensions
  Gulf of Mannar marine biosphere reserve is the first of its kind in India and also in south east Asia. It extends from Rameswaram in the north to Tuticorin in the south. GOM is having a chain of 21 islands running almost parallel to the mainland. It has been declared as India's first 'Marine Biosphere Reserve'.
- Kind of resource management, livelihood practices
  There are about 11 mechanized fishing boats, 5800 country crafts and various kinds of nets such as trawl net, gill net, shore seines, drift net, long line, traps and others. The average catch per day per boat varies from 10 to 20 kg and the main fish catch includes fin and shell fish. The average income is about Rs.. 500 to 5000 per month per person. Most of the women involved in seaweed collection.
- History: use of resources/ cultural practices / key events and projects
  The Central Marine Fisheries Research Institute has played a significant role in the conservation of sea cucumbers. During the last 32 years, considerable amount of information on the taxonomy, resources, ecology and zoogeography of sea cucumbers is collected. James et .al (1989) produced the seed of *Holothuriascabra* in the laboratory for the first time as early as in 1988. This significant breakthrough goes a long way to pave the way for the culture of the species.

Conditions:

- climatic, geographical, ecological, socio-economic, demographic, cultural context
  The monthly average annual atmospheric temperature varies from 250C with the minimum and maximum in January and May, respectively. The area comes under the spell of both southwest and northeast monsoons. The mean annual rainfall varies from 762 mm to 1270 mm. There are 49 villages along the coast, of which 38 are in Ramanathapuram district an 11 villages are in Tuticorin district bordering the Marine Biosphere area. Altogether, there are 53, 880 fisher folk, of whom 13,500 are active fishermen. They live in either huts, tiled or concrete houses. The literacy is about 38 % in this area.
- Natural hazards and recent disasters in the area.
- Climate change vulnerability information for the area, if available
- The impacts on coastal zones of sea-level rise and climate change include inundation, riverine flooding, saline intrusion, erosion, and wave damage. The impacts of changes in weather conditions (winds, waves, storms, and storm surge) may be comparable to those of sea-level rise alone.

Coastal and marine biodiversity:

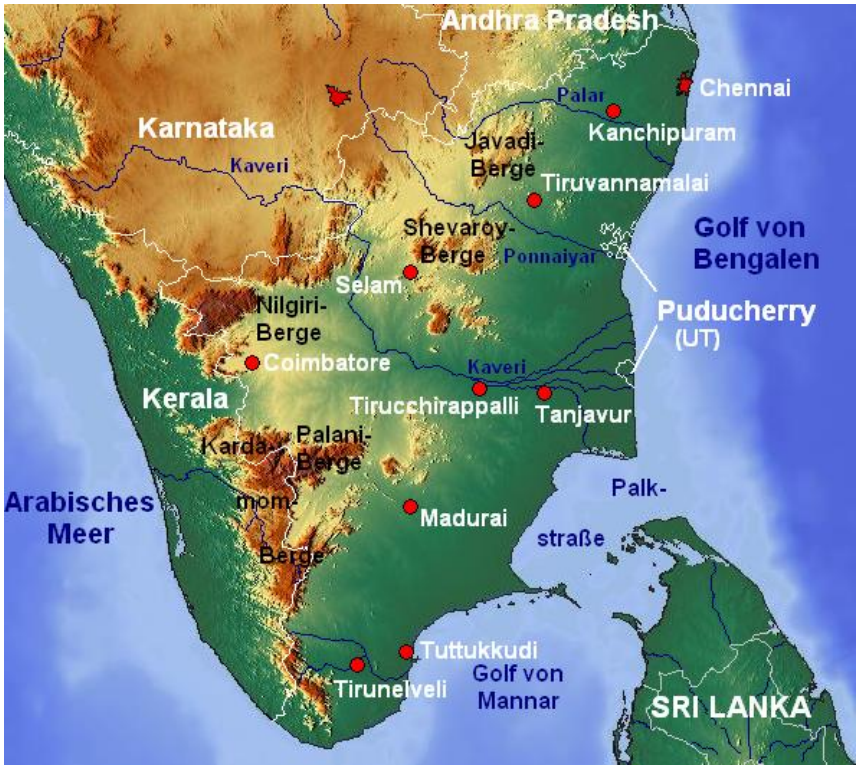
- Brief on the habitat, species and genetic diversity present in the area
- GoM areas are endowed with a combination of ecosystems including mangroves, seagrasses and coral reefs. Most of the islands have luxuriant growth of mangroves on their shorelines and swampy regions. The sea bottom of the inshore area around the islands are carpeted with seagrass beds which serve as ideal feeding ground for Dugong dugon. Highly productive fringing and patch coral reefs surround the islands and are often referred to as underwater tropical rainforest and treasure house for marine ornamental fishes. Occurrence of these specialised ecosystems makes Gulf of Mannar an unique large marine ecosystem in the Indian subcontinent.

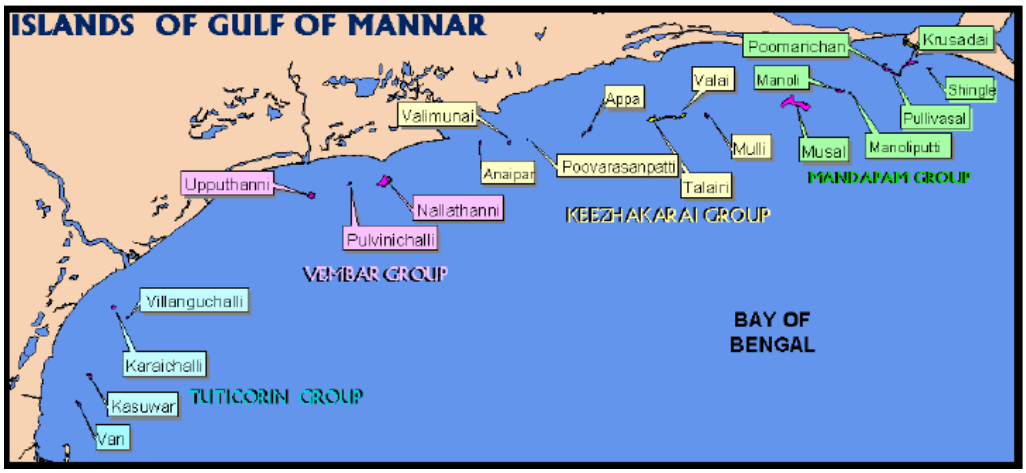
2. General description of project / initiative / effort

- Purpose / objectives: To conserve the sea cucumber stock and initiate sustainable exploitation
- Implementing entity / partners: Central Marine Fisheries Research Institute
- Project / initiative duration: From 1989 to 2002

3. Outputs and Outcomes

- biodiversity conservation
- livelihood security and sustainability
- Influencing policies/ decisions at a broader scale





3) Statistics

200 species of sea cucumbers are found in the coral reef colonies in India, of which 20 species were found in the Gulf of Mannar and Palk Bay regions in the State. Out of the 20, two were over-exploited and were exported in large number to Singapore from where they were distributed to Taiwan, China and Japan, where they are considered delicacies. Normally, the sea cucumbers are found in inter-tidal regions of the coast, along the sea grass and coral reef colonies.

4) Related links

http://eprints.cmfri.org.in/4100/
http://eprints.cmfri.org.in/view/creators/James=3AP_S_B_R=3A=3A.html
http://eprints.cmfri.org.in/view/creators/James=3AD_B=3A=3A.html

5) Related publications

James, D B (1996) ***Conservation of sea cucumbers.*** **In**: Marine Biodiversity: Conservation and management. Menon, N Gand Pillai, C S G,**(eds.)** CMFRI, Cochin, pp. 80-88.

James, P S B R and James, D B (1994) ***Resources, exploitation, conservation and Management of holothurians: conservation and management of sea-cucumber resources of India.*** CMFRI Bulletin, 46. pp. 23-26.

Ambrose Fernando, S (1994) ***Problems facing the fishermen of the Beche-de-mer industry.*** CMFRI Bulletin, 46 . pp. 110-111.

Climatic balance on coastal ecosystems in Gulf of Mannar: Geoclimatic techniques. INTERNATIONAL JOURNAL OF GEOMATICS AND GEOSCIENCES AND GEOSCIENCES. (http://www.ipublishing.co.in/jggsvol1no12010/volthree/EIJGGS3155.pdf)

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ANDHRA PRADESH

17. Communities protect their coastal wetlands

Sompeta wetland spread across 4000 acres in Srikakulam district of Andhra Pradesh is playing crucial role in sustaining the livelihoods of local communities (about 1 lakh families) and have unprecedented ecological value. Followed by land allotment and environmental clearance to a thermal power company local communities and organizations protested during which unfortunately lives of 4 farmers were lost. The environmental clearance was revoked by the Ministry and the High court followed by this.

Title: Communities protect their wetlands

Author(s): Ms. Vanitha Kommu, CEE

Name of the State and study Location: Andhra Pradesh Sompeta Beela in Sompeta mandal, Srikakulam District, Andhra Pradesh.

Objective of the initiative/ project: To reverse the sanction of the power plant to Nagarjuna Construction Company Ltd, which encroaches upon the wetland and threatens their livelihoods security that are dependent on the wetland.

Implementers: Communities – with support from organisations like Paryavarana Parirakshna Samithi (PPS) of Sompeta, Bhavanapadu Thermal Vyathireka Porata Samithi of Kakarapalli, Samata, Forum for better Visakha.

Dates: 2009-10

1. Background information

Sompeta wetland is in Sompeta mandal of Srikakulam district of Andhra Pradesh (**Coordinates:** 18.9374, 84.590157). This wetland known locally as “beela” abuts the sea and is close to the Eastern Ghats in Sompeta mandal. This wetland occupies over 4000 acres stretching from Baruva in Sompeta mandal to Kapaasuguddi in Kaviti mandal, a length of about 20 km. This is a low-lying swamp area with a unique habitat, serving as a rich biological wetland with high ecological importance. It is part of perhaps the last surviving marshy stretches in Andhra coast and they are an integral part of the surface-cum-marine ecosystem that supports a variety of flora and fauna apart from providing livelihood to thousands of families in the area. The local communities, a population of about 1.5 lakhs consists principally of agriculturists and fisher-folk. Water from the “beela” is the lifeline for a two-crop paddy in an extent of not less than 5000 acres in the area.

For many of the fisher-folk, belonging to Manikyapuram village of Kanchili mandal, the “beela” is the only source of livelihood as they do exclusively inland fishing. Fisher-folk from Kaviti mandal are also leased out fishing rights by the fisheries department every year. The *kandra* and *agnikulakshatriya* fisher-folk communities survive on this “beela”.

It is largely because of the “beela” that the groundwater table in the region is healthy and there is no water crisis for either domestic or farm usage.

The “beela” also serves as a huge grazing area for sheep and cattle. Apart from this, hundreds of families eke out a living making mats from the grass obtained in the “beela”. It is also used as roof-top material and animal fodder. This marshy land has at least 40 middle-sized ponds and a vast area used as salt farms. About 30,000 people depend on it for survival. This very swamp was the epicentre

of the salt satyagraha led by Mahatma Gandhi for the southern and eastern provinces. On April 6, 1930, a big crowd gathered at the swamp to break salt laws.
Moreover, the "beela" is a bird habitat for about 120 species. Every year in the month of October thousands of birds from Australia and Siberia, known locally as "*kondamkodi and nathagotta*", visit the area for about six months. They use the "beela" as a nesting and feeding habitat. This is an important migratory route and passage migrant place. It is an important foraging ground for Pelicans and Painted Storks from the Telineelapuram Important Bird Area (IBA), just 4 Km away. The area is also home to several wild animal species known locally as "*varudu* and *peddhanakka*". The "*pamula metta*" in the "beela" contains many varieties of snakes. The "beela" has about 493 plant species and is also home to rare medicinal plants like "aswagandhi" and "sarpagandi" as well as the well-known "*Eclipta alba*" which is used extensively to treat jaundice.

2. General description of project / initiative / effort

Nagarjuna Construction Company Ltd (NCC) has proposed to construct a coal based 2640 MW (4x660 MW) Thermal Power Plant (TPP) at Gollakandi and Baruva villages of the Sompeta mandal and procured 2423.599 acres of land from government and private parties. Of the 1882 acres handed over to NCC, 1200 acres is in the Beela.

In the environmental impact assessment report, the company reported the area as barren, uncultivable, uninhabited, low-lying land belonging to the state and there are no rehabilitation and resettlement issues, since there is no habitation on the land. The EIA was conducted in summer (March-May) when water is at its lowest in the swamps and migratory birds are not seen. The revenue officials described it as "*Tampara*" meaning wasteland. The forest department terms the patch of land wetland with rich biodiversity.

The plant requires sea water, with the hourly water requirement at around 28,700 m3 and will release around 22,337 m3/hour of hot cooling water back into the sea.

However, for obvious reasons communities of the 30 villages surrounding the swamp in Santhabommali mandal do not want to part with it. They want the 2,640 MW plant to be scrapped.

3. Process of implementation

The environmental public hearing for the NCC thermal plant that was held at Gollagandi village on 18-8-2009 witnessed an overwhelming majority of people strongly opposing the proposal. Cutting across community, class, occupation and political party' lines, people of the three mandals have been organising countless rallies, dharnas, postcard and other peaceful campaigns against the thermal plant proposal since several months. In fact, a totally voluntary *bandh* [general strike] was observed in Sompeta, the mandal headquarters on August 21.

Environmental NGOs under the leadership Environmental Paryavaran Samrakshana Samiti spearheaded the agitation by the locals against the setting up of the power project in the area. On the 14 July 2010, NCC attempted levelling the land allocated to them although they were yet to receive the mandatory 'Consent for Establishment' from the AP Pollution Control Board. The action provoked the local public leading to violence in which two people were shot dead and many others including scribes and police personnel got injured. Other 2 people succumbed to injuries later.

4. Outputs and Outcomes

Followed by the clash the National Environmental Appellate Authority (NEAA) quashed on July 2010 the environmental clearance given by Expert Appraisal Committee of the Ministry of Environment, Forest, and Climate Change (MoEFCC), ordering the state government not to alienate such lands. This is followed by a visit to the wetland with experts. National Green Tribunal directed to keep the Environmental Clearance suspended.

On July 15, 2010, the Environment Clearance was suspended by the Union Ministry of Environment, Forest, and Climate Change (MoEFCC). The ministry instructed the Regional Chief Conservator of Forests (RCCF) to submit a report. The ministry also ordered the Expert Appraisal Committee dealing

with thermal power projects to examine whether the project site was a wetland and whether the company adhered to conditions of the environmental clearance given in April 2009.

Some farmers who lost their land to the Nagarjuna Construction Company Sompeta Thermal Plant approached the High Court to challenge the Government Order for the plant. In June 2010, the petitioners highlighted a communication from the Chief Commissioner of Land Administration (CCLA) issuing instructions (No. B2/2225/2003) to all district collectors ordering them "to protect water bodies on war-footing basis under Neeru Meeru Programe and to identify and include all lands covered by water bodies," which petitioners say the plant violates. The petitioners also contend that the land allotted to NCC for thermal power project is a precious wet land on which local people are dependent. On June 23 2011, a single bench of the Andhra Pradesh High Court had ordered a stay on the land allotment to the company.

It is a victory for the people who protected the well-being of the ecology as well as defended the rights to their land.

5. Discussion

The case presents important learnings on how government decisions of managing biodiversity through a non-consultative process can lead to ground level conflicts, including insecurity of livelihoods of local community dependent on the biodiversity. People's movement can be positively channelized to draw the attention of the government agencies and decision makers towards their perspective and reasons for involving them in the management plans. The value of mass awareness campaigns, innovative outreach programs to involve citizens in the local environmental and developmental issue is also important. Agencies need to capitalize on proper messaging, communication strategies to bring peoples strength and voices for positive biodiversity conservation action. The case also presents that a better public-policy dialoguing mechanism needs to be put in place in order to avoid extreme cases of people losing lives during agitations against government decisions. Public hearings can be made more effective by drawing legal expertise to facilitate discussions and also assist people with legal literacy in order to articulate their opinion and get justice. Biodiversity conservation requires people's participation and dialoguing in order to avoid management related conflicts.

18. Nelapattu community efforts in protecting coastal bird areas

Title: Nelapattu community efforts in protecting coastal bird areas

Author(s): Ms.Vanitha Kommu, CEE

Name of the State and study Location: Andhra Pradesh, Nelapattu village, *Doravarisatram Mandal* of Nellore district, Andhra Pradesh

Objective of the initiative/ project: To reveal the impact of government initiated protection of bird area without consulting community members and how traditional practices of protecting wetlands, bird life and livelihood supported in conservation of coastal wetlands and biodiversity.

Implementers: Forest Department, Communities of Nellapattu village

Dates: 1997-2000

1. Background

Nelapattu is a village situated in *Doravarisatram Mandal* of Nellore district of Andhra Pradesh. This village is the host for foreign visitors every year. Since time immemorial the village hosts birds which visit these villages between the months of October and May for nesting. 37 species belonging to 14 families were recorded. The Nelapattu tank (wetland) of 82.56 ha is the home for the birds. Hordes of

migratory birds come here from places as far as Siberia. The winged visitors include flamingos, painted storks, egrets, grey pelicans, grey herons and water birds like pintails, black-winged stilts and sea gulls. Reptiles such as the monitor lizard, the cobra, the Russell's Viper and the krait have been recorded here. The tank is dominated by two species of plants i.e. *Barringtonia acutangula* and *Prosopis juliflora*. The Prosopis plants were used for roosting while the birds built their nest on the submerged Barringtonia trees. These avian visitors get their food supply from the *Nelapattu* tank as well as from neighboring Pulicat lake which has plenty of plankton and fish. Pulicat lake is the second largest brackish water lagoon in India. The lake is spread over 600 sq km, and covers *Tada, Sullurpet, Doravarisatram, Chittamur* and *Vakadu mandals* of the district.

Nelapattu is identified as Important Bird Area in 1976 and declared as Bird Sanctuary in 1997, which became the largest pelicanry in south-east Asia. The sanctuary is spread over 458.92 hectares comprising Kalluru Reserve Forest of 288.15 ha, Nelapattu tank of 82.56 ha and unreserved forest areas of 88.22 ha. The sanctuary receives an annual rainfall of about 1000 mm. The sanctuary hosts 1,500 pelicans during the breeding season every year.

2. Process of Implementation – traditional process

Nelapattu once was a symbol of harmonious coexistence of humans and birds. According to local community the *Nelapattu* Bird preserve is about four decades old. Birds are regular guests and the villagers cheerfully accepted the guests giving them total protection for as long as they stay. They believe that the birds are symbols of good luck and that their yearly arrival ensures timely rains and good harvests. They also receive benefit in turn from these birds. Every year, the villagers get tons of free manure, which enrich their field. A great volume of guano is dissolved in the tank water and the villagers use this water for irrigating their crops. This shows the symbiotic relationship between the humans and birds making this village heronry significant for conservation. The villagers enjoy the visits by the guests and protect them.

Even very young children in the village are trained not to disturb or cause any harm to them. In the event of any accidental fall of the young ones from their nests, the village women nurture them and, if required, send them to the neighbouring Tirupati National Park for treatment. There have been instances of confrontation faced by the villagers with the neighbouring villages that have attempted poaching.

Water scarcity for agricultural purposes is a crucial issue in this region. The prime occupation of the villagers is agriculture and paddy is the main crop. *Nelapattu* tank receives water only during the monsoon. The villagers cultivate their land with this water and this is also the only drinking water source for the livestock in and around the *Nelapattu* village during summer. The birds leave the sanctuary during April/May because of insufficient water. The banks of the tank are also used for grazing cattle. The fisher folk are dependent on the lake's 'aqua wealth' - the lake yields an average of 1,200 tonnes of fish a year, including prawns, sardines and pomfrets.

Implementation process – modern intervention impact

In 1997 the Forest Department took over the protection of the Nelapattu tank by declaring it a sanctuary; however, communities were not consulted or communicated on the same. The intention to declare the sanctuary was notified on 15 September 1997 wide notification G.O. Ms. No. 107 and the completion of procedure took a period of about two years. The area of the sanctuary is 4.58 sq. km. It is now one of the 11 protected areas in Andhra Pradesh.

Prior to declare it as sanctuary, government did not consider the current use of the tank for irrigation by villagers. The people of *Nelapattu* were not aware of this decision taken by the government. Later on, with the help of a local NGO called CAMEL, the villagers came to know about the notification and immediately submitted their concerns to the Mandal revenue officers and forest officials.

After declaring it as the sanctuary, the entire tank area of *Nellapattu* was fenced to keep the villagers away. This caused hardship to local farmers who are dependent on the tank for irrigation, grazing, fishing etc. Only the tourists were allowed for bird watching during the day.

Subsequently, *Nellapattu* village was selected as one of the eco-development sites under the

World Bank-supported Andhra Pradesh Forestry project. As part of this scheme an eco-development committee was formed in the village by the Forest Department. As part of the project bore wells are dug for a few beneficiaries, which could only be utilized by the well-to-do villagers. In addition, smokeless *chullahs* and solar cookers were also distributed to the members of the Eco-Development Committees. This programme however did not offer scope for access to the tank to the villagers again. Besides, even the interventions under the programme are never discussed with villagers. The activities prescribed in the plan for village development are never discussed with the community.

The Nellapattu community complains of shortage of fodder and fuel requirements of now. The bore wells are not able to meet the diverse requirements of water for crops, cattle and the other domestic needs of the villagers. The cattle grazing issue has also not been dealt with in the eco-development scheme. If the cattle are caught within the fenced area, the concerned villager has to pay a fine. With these restrictions many villagers were compelled to sell their cattle. The villagers make their point that they were the ones who offered protection to the birds before the Forest department came into the picture, and now the needs of the birds have taken priority over theirs.

3. Discussion

Nellapattu is one example of conservation efforts excluding communities and undermining the livelihood security. The community played key role in protecting the birds in *Nellapattu* for generations. This heronry had gained fame among bird-watchers even before it was declared a sanctuary. Due to the villagers' efforts, the tank became a heronry and was declared a sanctuary. The sanctuary was declared without consulting or informing the villagers and this has strained the relationship between the people and the birds. The birds, which were once considered as harbingers of good fortune, are now considered to be a symbol of misfortune by the villagers. In the long run the apathy and indifference among the villagers caused by this situation is bound to threaten the security of the birds themselves.

19. GPS technology for traditional fishers in Kakinada

Author(s): Ms. Indira Prakash, CEE

Name of the State and study Location: U Kothapally , Kakinada Rural, East Godavari, Andhra Pradesh.

Objective of the initiative/ project: The main objective of the project is to enhance the income of the fishermen to reach exact PFZ area with the help of GPS

Implementers: MS Swaminathan Research Foundation (MSSRF), Indian National Centre for Ocean Information Services (INCOIS) and Agriculture Technology Management Agency (ATMA)

1. Background information:

Kothapalli (also known as Uppada Kothapalli or U.Kothapalli)is a mandal(Mandal code-22) in East Godavari District (Dt code-4), AP State, India. Under this mandal there are around 16 villages. Around 100 fishermen have been receiving the Potential Fishing Zone (PFZ) information. This has helped the traditional fishers to be better prepared with direction and depth related information for their expected fish catch. Mr. Chokka Prasad residing in Naickar Colony in Uppada village of U Kothapalli Mandal is the one who took initiation for the usage of GPS handset and encourage many fishermen to use technology so that the PFZ information could be used by the traditional fishers and enhance their income.

2. General description of project / initiative / effort

M.S. Swaminathan Research Foundation (MSSRF) is implementing a project supported by Indian National Centre for Ocean Information Services (INCOIS) to disseminate the fishing related information such as ocean state forecast and potential fishing zones (PFZ) to the fishermen. The wave height and weather forecast service is useful for the safety of the fishermen during rough weather and high tide conditions. Similarly, the Potential Fishing Zone (PFZ) advisories are beneficial to artisanal, motorized and small mechanised sector fishermen engaged in pelagic fishing activities. The information provides the availability of pelagic fishes such as sardines, mackerel, anchovies, tunas and carangids. The information significantly reduces the searching time which in turn result in saving valuable fuel and also human effort. Fishing expenses are also comparatively less for vessels which operated within PFZ. More over the availability of commercially important species are more in the PFZ areas than the non-PFZ Areas. Hence, the identification of PFZ is more important to get better catch which is possible only by using GPS.

3. Process of implementation

The fishermen of the mechanized sectors have in built GPS and fish finder which helps easy navigation to the PFZ area. The motorized and non-motorized fishermen are finding difficult to get the exact PFZ location because of lack of hand held GPS. They are also finding very difficult to reach the fishing harbours/ villages after catching fishes due to lack of GPS. In this condition, MSSRF conducted awareness programme on the new technology in the district of East Godavari with support of Agriculture Technology Management Agency (ATMA). Initially 20 fishermen came forwarded from U Kothapeta, Kakinada Rural and Thondangi Mandal to take GPS hand set. MSSRF provided two days training on the usage of the handset and also facilitated in purchasing the handset. The Garmin 72 H model will be provided as it floats in the water if accidentally dropped in the water and also it is water resistant. Financial support was taken from the Manadal Mahila Samaikay. Now in U Kothapally alone 400 fishermen are using GPS hand set.

4. Outputs and Outcomes

The GPS helped in fishing in many ways such as navigation for PFZ, identifying the vulnerable localities, mapping routes, marking waypoints and tracking routes. The information significantly reduces the searching time which in turn result in saving valuable fuel and also human effort. In addition to this, information about the availability of fishes such as sardines, mackerel, anchovies, tunas and carangids which has commercial value has increased the fishermen income.

In the hand set 30 shore line lactation were feed which is helping them the fishermen to get back to their respective villages or nearby villages when drifted during the cyclone seasons. Now they are travelling towards western side to the sea shore and travel south wards. The waypoints and the routes will save time and energy there by reducing the fuel cost.

5. Discussion

Overall, the GPS technology for the fishers has been beneficial in improving their fish catch and reduces unproductive costs. Emerging constrains are as given below:

1. PFZ locations extend around 10- 15 km area. As the number of the fishermen using the GPS handset is very few now. In future, if all fishermen start using the system can be chance of putting pressure on PFZ
2. Technology is helpful for PFZ, identifying the vulnerable localities, mapping routes, marking waypoints and tracking routes but fishermen are requesting for information about the ocean currents, etc. Because, once they reach the PFZ, it will be very difficult to put nets are due to heavy speed of ocean current.

6. Recommendations

The success of the GPS technology intervention has also helped in exploring other initiatives based on technology like:

- Concerned over the rising attack on fishermen by the Sri Lankan Navy for crossing the International Maritime Boundary Line (IMBL), the M.S. Swaminathan Research Foundation (MSSRF) Centre has developed a mobile application that would alert the fishermen about a few km from the actual point.

  This application has been developed to safeguard the fishermen from Nagapattinam to Tuticorin when they proceed in boats for fishing as IMBL is located closer to their coastline as compared to other districts of Tamil Nadu. There about seven lakh fishermen in the State, of which nearly three lakhs are in these districts, said S. Velvizhi, MSSRF principal scientist.

- The application developed for Android based mobile phones, forms part of Fisher Friend Mobile Application (FFMA) phase-II programme. Five mobile phones incorporating features such as providing cyclone and disaster alerts, real time data on fish colony and danger zones and helpline numbers, was distributed to five fishermen from Kasimedu. Talking to *The Hindu*, Ms. Velvizhi said “We upgraded FFMA-II based on feedback provided by the fishing community. It was launched 20 days ago and is currently being used by 110 people. The real-time data is provided in Tamil, English and Telugu. In the next few days, the apps would be offered to fishermen of Kerala, followed by Maharashtra, Karnataka, Gujarat and Odisha. FFMA-II is jointly developed by MSSRF that provided design and data, Qualcomm (financial support and technical advice) and Tata Consultancy Services (application developer). FFMA-III will be uploaded on Google so as to extend its reach.

WEST BENGAL

20. An eco-tourism model for coastal and marine biodiversity conservation – the case of Sundarbans Jungle Camps

The Sundarbans' fragile **mangrove eco-system** is threatened by biotic pressure, and man-animal conflicts regularly occur. To support conservation efforts and create alternative livelihood measures a **tourism model project** named Sundarbans Jungle Camp was initiated. Bali Nature and Wildlife Conservation Society, West Bengal Forest Department, WWF India West Bengal Office, Wildlife Protection Society of India, Bali Eco-Development Committee are cooperation partners of the Jungle Camp. This initiative has been successful in creating a community based eco-tourism enterprise for the sustainable use of the biodiversity leading to improved socio-economic conditions while conserving the biodiversity of the Sundarbans area.

Title: An eco-tourism model for coastal and marine biodiversity conservation – the case of Sundarbans Jungle Camps

Author(s): Ms. Reema Banerjee, CEE and Mr. Asit Biswas, Help Tourism Pvt Limited

Name of the State and study Location: West Bengal, Bali island

Objective of the initiative/ project: To offer an eco-friendly tourism model that involves community participation for the conservation of biodiversity while improving the socio-economic status of the community.

Implementer: Help Tourism Private Limited - a multiple-awards winning responsible tourism organization, social enterprise, full service destination management company specializing in developing community based tourism projects and businesses across the protected area network of East Himalaya. The project Sundarbans Jungle Camp was wholly financed and funded by Help Tourism Private Limited, all training programmes on ecotourism and rural hospitality management and related subjects as well as all capacity building programmes for local communities of Bali and adjoining villages were provided by Help Tourism Private Limited in association with Association for Conservation & Tourism (ACT - a non-profit NGO), Bali Nature & Wildlife Conservation Society and Forest department.

Partner of the project: Bali Nature & Wildlife Conservation Society**.**

Supporting organizations: WWF - India (West Bengal State Office & Sundarbans Programme Office), Wildlife Protection Society of India, Forest Department, Local Eco Development Committee, Association for Conservation & Tourism (ACT)

Dates: Thought process since mid-1990s – Project operational since 2003

1. Background information

General:

- Details on the location/ geographical dimensions
- Kind of resource management, livelihood practices
- History: use of resources/ cultural practices / key events and projects

The Project site – referred to as the Sundarbans Jungle Camp is located at Bali Island, 24 Parganas South, West Bengal, India, in immediate vicinity to the Sundarbans National park area. Around the settlements on the inhabited islands, the landscape is characterised by agriculture and fishery

activities. The uninhabited areas contain dense impenetrable mangrove forest pervaded by creeks and rivers. This camp area and surroundings were threatened by biotic pressure, and man-animal conflicts.

Conditions:

The climate of the region is humid with average temperature ranging from 20°C to 34°C. Best time to visit is from mid-September until mid-March. The Monsoon season is from mid-June until mid-September, and heavy storms can occur in May and October and November. This region is particularly vulnerable to climate change impacts – especially sea level rise.

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area

The area is host to several species of mangroves and associates. It is rich in variety of marine biodiversity, including the royal Bengal tiger.

2. General description of project / initiative / effort

- **Purpose / objectives**

to implement an eco-tourism plan that helps in conservation of the local biodiversity while offering an alternate livelihood option for the local community.
to assist the Forest Department and the local conservation NGOs in reducing the tiger-human conflict.

- **Implementing entity / partners**

Bali Nature and Wildlife Conservation Society, West Bengal Forest Department, WWF India West Bengal Office, Wildlife Protection Society of India, Bali Eco-Development Committee are cooperation partners of the Jungle Camp.

- **Project / initiative duration**

2003 – to present

3. Process of implementation

- **Actors: Who is involved in the process**
- **Implementer: Help Tourism Private Limited** - a multiple-awards winning responsible tourism organization, social enterprise, full service destination management company specializing in developing community based tourism projects and businesses across the protected area network of East Himalaya. The project Sundarbans Jungle Camp was wholly financed and funded by Help Tourism Private Limited, all training programmes on ecotourism and rural hospitality management and related subjects as well as all capacity building programmes for local communities of Bali and adjoining villages were provided by Help Tourism Private Limited in association with Association for Conservation & Tourism (ACT - a non-profit NGO), Bali Nature & Wildlife Conservation Society and Forest department.

- **Partner of the project:** Bali Nature & Wildlife Conservation Society.

- **Supporting organizations:** WWF – India (West Bengal State Office & Sundarbans Programme Office), Wildlife Protection Society of India, Forest Department, Local Eco Development Committee, Association for Conservation & Tourism(ACT)

- **Tools: What implementation tools/ techniques have been used?**

The project largely relied on consultations (meetings, PRAs) with the local community, scientific research inputs to designate areas that require minimum disturbance and areas which could allow interactions with visitors with adequate safeguards, mass awareness programs

- **How is the participatory approach used? What communities were involved in the process? In what ways?**

In the first phase the habitat or Protected Areas (PAs) with critically endangered species were selected in consultation with the local people and the Forest Departments. Further the community were motivated to be involved in the process by involving them in site selection of the construction of the jungle camp, and construction process. They were asked to identify suitable members from their community to be part of the day to day tourism management activities of the camp. The jungle camps are located on the fringe villages adjoining important Protected Areas. The camps help in creating a 'local community of visitors and local people' acting like a buffer and as a stakeholder in conservation of the nearby PAs. Since the income is coming from the camps, the local communities pressure on the PAs are reduced.

- **Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved?**

The implementation of the project did not generate any controversy. The pressures were felt on the PAs because of the increasing pressure and spread of subsistence farming and fishing. Since the camps were to generate additional income and offered a new way of earning without disturbing the biodiversity, the community was agreeable to the idea of the project. Further, the clear communication about their roles, opportunities for engaging in the project from the design stage till implementation and monitoring helped bring ownership of the project by the local community.

- **What particular success/ difficulties did the implementation met with?**

The major success of the project is to offer an alternate source of income for the local community, revive their traditional customs and culturally make this area more significant by allowing outside visitors to appreciate better about the Sundarbans and contribute towards its conservation. The overall impact is the conservation of the coastal and main biodiversity.

The positive impact shall remain minuscule unless such tourism model is replicated at a large scale and until the mainstream tourism business is rechristened to such responsible business practices.

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- **biodiversity conservation**: *biodiversity conserved, less stress on protected areas*

Economic benefits / Livelihood security

1) The construction staff was recruited mainly from seven surrounding villages. It generated 7,000 man-days providing job and income to the local villagers.
2) 70 percent of all materials used for the construction of the camp have been purchased locally.
3) Despite the beverages that have to be 'imported' from outside the Sundarbans, the ingredients of food provided in the camp is mainly purchased locally and preferably bio-organic.
4) Young fishermen are hired for country boat tours into the mangrove creeks
5) The Camp permanently engages seven local boats owned by local villagers who earn steady income from the camp and have completely given up hazardous and environmentally unsustainable livelihood such as poaching, illegal felling and fishing.
6) Three local ladies' self-help groups are looking after the housekeeping and camp maintenance, supply of organic fruits and vegetables and laundry services for the camp.
7) Bio rice farming has been introduced which is to be followed up with other cash crops such as turmeric, ginger, and red chili. Initially 18 local farmers picked up the idea and had successfully shifted to organic rice farming but sadly lost their crops after Cyclone Aila in 2009 due to salinity left by the salt water which inundated arable lands. Tourism Dept. procures this rice to be served to the guests of Sundarbans Jungle Camp and other lodges of Help Tourism.
8) The goods produced by the self-help groups are partly distributed by the camp. Besides the showroom in the camp's restaurant area from where produces are sold, visiting self-help groups or local craftsman are also integrated in the guided walking tour.
9) 30 self-help women's groups that have been formed and have been motivated to create micro-banking system within the groups. They have their accounts with a Nationalized Bank now. Gradually, they shall be motivated to develop micro-enterprises in the villages.

10) The ownership of the organic honey, date palm sugar and craft items stay with the local community through Bali Nature and Wildlife Conservation Society. The money goes straight to the community and the small profit earned from the selling of such goods remains with BNWCS so that they can utilize the fund for their various social and conservation programmes.

- **Influencing policies/ decisions at a broader scale**: the project has very important learnings for managing Protected Areas and models for co-management with the local community involvement.

- **Changes in the perception of local communities towards conservation** (how the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?) the local community is of the opinion that the Jungle camp project has helped them improve their economic conditions, get an identity as protectors of the Sundarbans biodiversity, sustain their traditional knowledge and customs and that due to the biodiversity around them they are able to get a better livelihood income, which otherwise would have been not generated had it not been for the efforts of the Tourism Department, Forest Department and local NGOs in initiating dialogues with them, consulting them and involving them in the project design and implementation. Their social status and access to basic services has also improved due to the project, bringing in better equity and poverty reduction opportunities.

- Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation : the decision makers in this project feel that they have been able to reduce the stress on the biodiversity of the protected areas in Sundarbans, able to revive the people involvement in the conservation effort, helped them give identity and cultural significance to the project, and felt that involvement of the local community and constant dialogues/consultation with the local community is the key to successful co-management of PAs for biodiversity conservation.

The following social impact is noted by decision makers and implementers, including the local community due to the project, which was not really perceived in the beginning of the project. These social outcomes are due to decision maker and implementers sensitivity to local community opinion, feedback and willingness to play a facilitators role for project implementation.

The camp’s mobile phone device and the boats (not for tourism purpose but for conservation patrolling and monitoring of wildlife movement) are important resources in case of emergency, and facilitate networking in conservation initiatives.

1) The camp's tube well is accessible for the nearby-villagers. It provides them with fresh water and reduces their inconvenience of fetching drinking water much far from their homes.
2) More than 350 medical treatment camps have been organized over a period of 8 years. These camps benefit patients with medical supply, and local supporting staff by additional income for their work. As of now, roughly 70,000 people from 15 local villages have been benefitted.
3) A non-formal school with a permanent shade is fully functional with 40 students. Books, reading and writing materials, and teacher's remuneration are provided.
4) A permanent school building is under construction and expected to be operational
5) The education project ‘Support a poor meritorious student’ which is financing the higher education of meritorious pupils. The sponsorship covers school fees, transportation and lodging costs, as adequate facilities for higher education do not exist in most of the islands. Eleven students already have passed their exams; five more are now struggling for laurels.

Cultural impact:
The age-old culture of Bono Bibi Yatra was revived. The theatre play was an important asset of the Sundarbans, as it describes the history of the settlement. Remarkably, the forest Goddess Bono Bibi is equally worshiped by Hindus and Muslims in the region. Today, numerous actors of a theatre group earn additional income against every performance. Moreover, the play is a welcomed entertainment for the island's inhabitants as well, as they can connect themselves with this theater cohesively.

1) The camp is a socio-cultural meeting point, offering space for discussions, community

development workshops, and meetings for self-help group units.

2) A Nature Interpretation Centre has been developed by Wildlife Protection Society of India near the camp premises for educational activities (of both locals and tourists) and community programmes.
3) In order to raise the awareness about the surrounding environment and ecological diversity of Sundarbans, a community mobile education cum resource centre has been established. The mobile resource centre is a community asset where the local villagers, school students, members of nature clubs, members of Eco Development Committees can get to learn about the natural history and the unique ecosystem and flora and fauna of Sundarbans. Appropriate displays and audio-visual systems have been installed for easy yet interesting interpretation for the visitors. The centre will have a small snake bite management and trauma care centre for the villagers in future.

5. Discussion

This project worked because of the principle to involve local community in management of the biodiversity of this area. It designed a participatory method to create an eco-tourism model which captured peoples' opinion right from the design stage, implementation and day to day management. The key element was to generate income by using the local resources in a sustainable way – for e.g. engaging existing fishers as boatmen; engaging elderly people to narrate the local customs and cultural heritage of the area; using the local resources for construction of the camp; engaging local people for local construction and integrating local design and art work.

Constantly keeping the topic of eco-tourism concept alive and a subject of discussion was the key strategy. For this there were continuous mass awareness campaigns, seminars, workshops with local community, local NGOS, departments as well as external stakeholders who could provide expertise in eco-tourism, packaging and advertising.

The project also had clearly defined the utilization of the income generated and how this money would be used for what developmental activities. This generated trust amongst the local people and they actually have a say in how the income generated from the camps should be used.

The major challenge faced by the implementer was breaking the conventional and negative concept about tourism and changing the mindset of local villagers. Local community was of the impression that tourism was always exploitative in nature since they did not encounter any better example so far. We changed the notion and proved that 'Responsible Tourism' could be an effective tool for development and conservation.

6. **Recommendations / Conclusions**

The decision makers and implementers from the Government departments involved in this project strongly believe that any tourism activity is embedded in a social environment. Eco-tourism can generate revenue from the natural, cultural, and social resources that are owned by the local community. The most important point is to have a transparent, participatory mechanism to channelize at least 40 per cent of the revenue generated from the camp's tourism activity (package costs including accommodation and excursions) as re-invested into community development. This will win the long-term support, trust and total acceptance of the local communities for the camp, while meeting the biodiversity conservation objective.

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21. Large scale impacts of DRCSC on coastal biodiversity conservation and policy inputs through Climate change resilience model work through natural resource management.

Author(s)/Ms. Reema Banerjee, CEE and Information provided by Ms Chandrani Das, Project Coordinator, Development Research Communication and Services Centre (DRCSC)

Name of the State and study Location: Patherpratima block, Hingalganj block, sandeshkhali-II and Basanti Block of Sunderban region, South 24 Parganas, **West Bengal**

Objective of the initiative/ project: Climate change resilience model work through natural resource management (Food and Livelihood Security Advocacy)

Implementer: Development Research Communication and Services Centre (DRCSC) is a non-profit society working towards food and livelihood security through economically viable, ecologically sound and socially equitable management of natural resources through community based initiatives

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1. Background information

General:

- The villagers of the region are dependent either on the river or on agriculture. Cultivation of local varieties of crop by conventional farming practices has been practiced at large scale.

Conditions:

Increased rainfall, especially over the last 3-4 years has been associated with increased with increased occurrence of lightning rains in the monsoon season. Winter and summer have become warmer in the last few years. Intermediary seasons have changed- spring has now disappeared and autumn is shorter.

Few of the blocks are completely isolated from the main land and surrounded by Saptamukhi River in the west, Walse creek in the north, Carjon creek in the east and Bay of Bengal in the west.

The villagers are basically cultivators and belong to marginal, sub- marginal farmer's categories. Household belongs to below poverty line, having close proximity to the sea a considerable portion of work force that is mainly belonging to farmers and agriculture. Labours take up sea fishing in the lean season of cultivation in spite of high risks in this venture.

The region and villages are mostly vulnerable to natural disasters like cyclonic storm induced flash flood, coastal erosion, tidal surge and breach of embankments. Recent disaster in this area is Aila.

Climate Change induced disasters like flood, embankment breach, storm and erratic rainfall, increase salinity of soil. Rivers have changed their courses. Levels of water and salinity in the rivers are rising. Frequency and intensity of storms have increased. Incidence of sudden storms is also on the rise. Absence of rainfall at the usual time is affecting agriculture, fishing and collection of fingerlings and crabs.

Coastal and marine biodiversity:
There are trees of indigenous and the mangrove varieties are found. indigenous varieties of fish like shole, boal, latha, lekha, koi, shingi, magur etc. many birds and animals like vulchers, common myna, sparrow, falcon, civet, fox etc are found. leafy vegetables like gima, shushni, chikni, helencha, swetfulka are found. but now-a-days these are more and more getting unavailable

2. General description of project / initiatives / effort

Climate change resilience model work and food and livelihood security through natural resource management. The various small models or initiatives are as below

A) INTEGRATED FARMING (2004/05 – ongoing)

Objective/Rationale: Most of the farmers in our country possess less than an acre of land inclusive of paddy field, pond and homestead. Usually they have one or two goats, 10-12 ducks or hens, one or two cattle, which are substituted by pigs in dry areas dominated by tribal communities. Integrated farming refers to agricultural systems that integrate different subsystems like livestock, fish, poultry, insects and perennial/seasonal crop production. These are combined in such a way and proportion that each element helps the other; the waste of one is recycled as resource for the other, so that total biomass production is enhanced, both in terms of quantity and quality, incidence of risk is reduced and the system becomes energy efficient as a whole.

The process/approach: The models are developed upon the first principle of ecology that all the components of nature, biotic and abiotic are interrelated. It is an established principle in ecology now, that stability of a system is enhanced by establishing connections among different components of different biotics of a system.
Farmers/gardeners are motivated to change the shape/style/design of the land so that it can accommodate multiple subsystem (Rice-Fish- Duck-Azolla for example) and can be developed into an integrated farming system.
Waste of one component is used as a resource for another to set up a network of nutrient flow.

Outcome/Output:
At least 98 farmers in the coastal zone of South 24 Parganas, North 24 Parganas and Purba Medinipur districts and a total of more than 719 farmers under the operational area of DRCSC have developed integrated farms under the guidance and motivation of DRCSC. The farmers have adopted measures for soil conservation, rainwater harvesting and also for prevention of water runoff and soil erosion. The organic wastes generated from the farms, cowshed, household and other subsystems within the farm are reused and if possible recycled. Self-growing local plants and weeds are used for making compost and also as nutritional supplements for humans and cattle.

Nitrogen-fixing trees are planted for enriching the soil and also for supplying food, fodder and fuel. Farmers have been motivated to process the produce before selling for value addition. They have been trained and made aware so that they stop making use of chemical pesticides, reduce and gradually stop using chemical fertilizers and emphasize on preparation and use of organic fertilizer, green manure, vermicomposting, extract of various plants and weeds or ash as organic pest repellent etc.

The diversification that came from integrating different subsystems imparts stability in production, efficiency in resource use and conservation of the Environment. It optimized the use of resources and minimizes pollution. An integrated farm has maximum resilience capacity, optimum productivity with maximum input use efficiency and higher sustainability. It diversified livelihood option and farm output, created on farm active days. From a less than one-acre farm net income in a year increased many fold.

Discussion (Prospects and Replicability)

The initiative has high replicability, as the framework fits well with asset and endowment of the small and marginal farmers. Different subsystems can be introduced in phases according to situational demand and capacity of investment. Land shaping designs and subsystems may vary widely in accordance with the objective situation of the farmer concerned.

The MGREGA fund can be used for doing land shaping.

Several models have already been established by the organisation which may be used by development agencies as advocacy tool for wider extension of these models by the panchayats.

B) Common Property Resource Management (2010- ongoing)

Objective/Rationale: Chronic shortage of biomass in general and of food, fodder and firewood in particular continues to be a major problem in West Bengal. Scarcity of food forces people to migrate for earning their livelihood. Shortage of firewood forces women in marginal families to burn cattle dung cakes and agricultural waste. Gradual shrinking of grazing land and loss of access to forests/common lands are factors that create an acute crisis of fodder. On the other hand, common properties like fallow lands, water bodies, river and pond banks, embankments of irrigation canals, roads and railway tracks etc. remain unutilized or are degraded due to overuse by the communities resulting in massive soil erosion or destruction of ecosystems. Groups of landless households in the village may be assisted to gain access to these common property resources and to plant trees on them to produce fodder & firewood along with some medicinal & food plants.

Process of implementation/Approach: Where 20 or more households of landless labourers, artisans etc. live near a road or canal alongside which 5 to 10m wide stretch of barren land is available, discussions are arranged with all household members to assess their needs of firewood, fodder, construction material etc. and to draw up a list of tree species preferred by them.

If members agree to plant trees, shrubs etc. and protect them, they are assisted to enter into a 20-30 years lease agreement with the local self-government or the panchayat.

DRCSC assists the groups with seeds, training for raising seedlings and some costs of raising saplings & transplanting them.
Usually 12-15 varieties of trees & 6-8 types of shrubs are planted along with some seasonal crops in early period to get some short-term return.

Members ensure protection of the plantation & share the NTFPs harvested. In the long term as 20-25-year-old trees are felled, 25% of the sale proceeds go to the village council and the rest is shared equally among the members of the group.

Outcome: Similar models of CPR management can be seen at a number of places in other districts. The success of Darbesh group of Kashiara village and that of Narayanpur Sishu Samity have prompted the marginal people in neighbouring villages to approach DRCSC for taking up similar plantation activity in their villages.

Even though the activities were started only 5-6 years ago, more than 50 such groups have already come up with about 1,055 members and altogether about 67 km stretch of land has been planted, with high survival rates. Many Panchayat officials and forest department staff visited the sites and complimented the villagers. 3 panchayats have already adopted this model of community managed multi-species / multipurpose woodlots, and are trying to promote similar projects through SHGs & SHPIs.

The Darbesh group has already auctioned mature trees worth Rs.1 lakh. Many other groups have followed suit and sale proceeds varied between Rs. 60,000/- and Rs.3 lakhs. New trees have already come up from the stumps.

The positive effects of the initiative are as follows:

- The women and children need to spend less time in searching for fodder & firewood.
- Many groups have become skilled in raising tree saplings and they are selling saplings to augment their group fund.
- The activity has resisted soil erosion to a large extent.
- The trees have started to provide shelter to many types of birds, small animals and pollinating insects. The birds in turn have brought seeds of many trees, medicinal plants etc. creating small biodiversity areas.
- The woodlot acts as a barrier to avoid damage by storm to nearby crop fields

Discussion (Prospects and Replicability): This intervention needs minimum investment and can be widely extended. Groups should be closely monitored to resolve conflicts at least at the initial stage.

Involvement of the Panchayat must be ensured right from signing the lease agreement up to the auction of trees and distribution of sale proceeds.

Apart from building a group asset, these can be adopted and supported by concerned departments of the Govt. as carbon sinks to contain factors
contributing to global warming.
Trees or plants on the verge of extinction may be brought back in the bio-variety net.

C) Nutrition Garden (2003/04- ongoing)

Objective/Rationale: The marginal and poor families usually have a small front yard and/or a back yard around their living space where they grow one or two vegetables haphazardly punctuated by two or three fruit trees. These families, especially the women and children mostly suffer from malnutrition. The problem aggravates during natural calamities. Marginal or poor farmers as well as landless households can utilize front and backyard or
the open space within their homestead to grow some nutrient rich vegetables, fruits etc. through recycling of household waste, grey water etc. The aim is to ensure that all family members especially women & children consume at least 150-200 gm of green vegetables /fresh fruits per person per day throughout the year.

Food and Livelihood Security Advocacy Series

Process of Implementation/Approach: Women and sometimes adolescent children are organized into small groups of 12-20. Garden Maps & Seasonal Calendars are prepared for each household to identify present production & consumption pattern and identify factors that limit productivity, length of growing season etc. A multi-tier arrangement of trees, bush, shrubs, creepers, runners of different heights and root depths is advised for optimum utilization of space, sunlight and soil nutrient. The natural forest ecosystem is emulated, where the tallest trees are placed in the west and plant height diminishes towards the east. A combination of vegetables and trees of different families is suggested so that fruits, beans, pods, roots, stems and leaves may be harvested all year around. Those varieties are chosen that have a longer fruiting time and seeds of which may be preserved at home. They are trained to prepare their own fertilizers and pest repellents by recycling wastes generated in the kitchen, cow and goat shed, bird house and garden. Training is also given on sustainable agriculture techniques, soil-water conservation etc.

Apart from vegetables / fruits etc., group members are encouraged to grow culinary & medicinal herbs, ornamental plants, erosion control plants etc. on the fence.
Group members save seeds and share it with neighbouring households also.

Members also discuss preparation of nutritious food, their preservation methods etc.

Outcome: DRCSC organized more than 200 women's groups who grow leafy vegetables, vegetables, legumes, roots & tubers, spices & herbs in their gardens. Throughout the year 15-20 varieties of crops can be found in their gardens. Average garden sizes are 60 to 70m2 / household and average yield / week varies between 12-14 kg during peak period and 7-8 kg during lean period. Now they can get their vitamin & mineral supply from these small gardens and cases of illness has gone down. The groups of women take the excess vegetables to the local market and can generate Rs.100-150 additional monthly income from which they regularly save in the group fund. Almost all the groups have started a collective bank account. Some have borrowed money from bank to expand their animal husbandry.

Positive Impact: Nutrition status of the families has significantly improved. Incidence of illness has gone down. A source of supplementary income from sale of surplus vegetables could be generated for the poor families. The skills and knowledge of these groups have enhanced. Their capacity to make decisions and plans has improved. Many group members now actively participate in village development council meetings etc. Inherent capacity of the women to contribute significantly towards food and economic security could be proved. They are now able to store and exchange seeds of 25-

30 vegetables, herbs etc. among themselves, which in turn has reduced their dependence on the non-replicable hybrid seeds sold in the markets.

Preparing their own fertilizers & pest repellents and keeping their own seeds have given them freedom from all sorts of market forces. It has made this initiative affordable even for the marginal farmers and the landless.

Discussion (Prospects and Replicability): The initiative can be extended to every household with the minimum input of a handful of seeds and some training. In spite of being an individual activity, group formation is essential for providing training, sharing & exchange of seeds, knowledge etc.

Different factors like design, selection of species, families and varieties, seed keeping etc. – elements that distinguish a nutrition garden from a usual kitchen garden -- must be taken into account.

D) Grain Bank (2003/4- ongoing)

Objective/Rationale: In most of the villages, there is no agricultural work during September-November and March-May. Naturally, hunger looms large over the poor families who earn their bread by working as agricultural labourers. The living condition gets even worse in the event of natural calamities like flood, drought or cyclonic storms. With only the walls at their backs, they are compelled to take loan from the local moneylenders at abnormally high rate of interests by mortgaging their assets and labour. In many cases they have to migrate to neighbouring districts in search of work.

Process of Implementation/Approach: Adult male and female members from 20-25 households are organized to form a group and motivated to set up grain banks as a measure to tide over the food crisis during the lean period and also during and after disasters. The bank is set up within the homestead of any member. In the flood prone zone, it is positioned at an elevated place where usually floodwaters cannot reach. Grain is stored in large bins made with straw rope, bamboo etc donated by members and usually constructed with their own labour. In cases where a stone or concrete platform is used as base to avoid rodent & pest attack, a regular mason has to be employed. Each member deposits a fixed amount of grain during the harvesting season. They take loan from the bank during the lean season and return it with a small amount of interest in the next harvesting season. The amount of interest goes to increase the stock of the bank.

The group members make their own rules regarding lending, mode of repayment and rates of interest. Members keep record of lending, repayment etc.

Outcome: In the last ten years, DRCSC has catalysed and supported 218 Grain Banks with 2400 households as members in different districts of West Bengal. Most of the banks have enough grain reserves to last for 60 days. Selection of the members for the grain bank is done after a detailed PRA exercise and food security analysis of each of the household in the village. The economically poorest families in the village are preferred and given the first priority for enrolment as members of the grain bank. During the harvesting season, the group members save a portion of their harvest (usually 50 kg) in the community grain bank.

DRCSC gives an equal amount as a matching grant. At the time of scarcity or any disaster, paddy can be borrowed from the bank at a low rate of interest. The amount of loan with a small amount of interest is returned to the bank at the time of the next harvest. The interest goes to increase their stock. The grain initially given by DRCSC as a matching grant is returned by the grain bank group to the local Area Resource Training Centre.

Indebtedness has reduced significantly. In fact, money lending business has almost closed down. New self-employment opportunities have also been created. who use it as a revolving fund for starting more grain banks in the vicinity. It is most interesting to note that more than 50% of the grain banks already established is run by the women's groups.

As the old grain banks start paying back the initial loan from DRCSC, new grain stores have started in other nearby villages, via area level revolving mechanisms. Local organizations have started accepting it as an effective disaster mitigation strategy. Position of women in the family has improved. More grain banks have already been started without any external support.

Discussion (Prospects and Replicability): This measure has proved very effective in enhancing food security during lean season and also during and after disaster.

Amount of support is minimum -- the matching grant and the cost of concrete platform. Panchayat may be advocated for a wider extension of the initiative. Advice and guidance of the facilitating agency may help in developing the rules of the bank, but they must be ratified by all members of the group. The initiative is not area specific. It can be adapted in any village or hamlet anywhere

Overall summary: The initiative of the organisation is remarkable and they have been working with community in the coastal areas as well as other districts of west Bengal on livelihood and food security advocacy issues. The component of biodiversity conservation is directly or indirectly very well linked and roped in, all of their initiatives. The replicability potentials of the projects being higher, has been favoured by many panchayats to enable DRCSC to replicate the same in non-coastal regions also. All the mentioned initiatives are ongoing and could be seen on ground.

22. Research inputs for biodiversity protection in aquaculture

In mangrove areas, especially in that of the Sundarbans in the Bay of Bengal Delta, raising freshwater prawns has been largely a subsistence activity, done in a traditional method with low-level inputs. Traditional practice focused on fertilizing the prawn ponds with manure from cattle or poultry. As supplementary feed, rice or wheat bran is used, in addition to oil seed cakes. However, with increasing demand, prawn culture has become a more intensive, commercial activity. As a result farmers are focused on total yields, with a correlated focus on per unit size and weight as per market requirements. For prawn farmers, this current demand on the yield and size of the final product resulted in the focus of feed shifting to commercially available protein-rich inputs such as meats and flesh of live mussels. It has been understood that the sustained use of such protein feeds had an overall negative impact on water quality in the landscape and ultimately the survival of the prawns themselves. This project focused on using science to complement traditional practices for prawn feed. It aimed at developing feed that relied on inputs that were locally available and could improve the quality of the water bodies. It aimed at having an overall positive impact on the survival and size of the prawns, thereby boosting economic opportunity whilst also improving environmental sustainability.

Author(s): Ms. Reema Banerjee, CEE and Dr Abhijit Mitra . Department of Marine Science, University of Calcutta, Kolkata

Name of the State and study Location: Jharkhali, 24 Parganas District, Sundarbans, West Bengal

Objective of the initiative/ project: The objective was find a locally available alternative to the commercial feed for the prawns, and developing feed that relied on inputs that were locally available and could improve the quality of the water bodies. It also aimed that the initiative/ alternative feed should have the potential to match if not surpass the yield and health of the prawns that were raised on commercial feed.

Implementers: Implemented by: Department of Marine Science, University of Calcutta; Funding agency: West Bengal Forest Department.

.**Dates:** Feb to October, 2009

1. Background information

Jharkhali, an island in the Sundarbans, is situated between two mighty rivers, Matla (on the west) and Bidya (on the east) covering an area of about 161 sq.km (2009).

2. General description of project / initiative / effort

- **Purpose / objectives**

It aimed at having an overall positive impact on the survival and size of the prawns, thereby boosting economic opportunity whilst also improving environmental sustainability.
The project also offered an alternate livelihood option for the local community by developing the nurseries of local salt marsh grasses to culture the feed.

- **Implementing entity / partners** As per information available, the entire funding, infrastructure and local facilitation at the site was done by West Bengal Forest Department. Only the technological alternative was provided and developed by Department of Marine Science, University of Calcutta, which reached and implemented in the site by local villagers through Forest Department. Forest Department only mobilised the local beneficiaries of the project in the study area.

- **Project / initiative duration** 2009

3. Process of implementation

- **Actors: Who is involved in the process**

The main actors in the process were West Bengal Forest Department and Department of Marine Sciences, University of Calcutta. The local villagers/beneficiaries were also involved in active lead in the project through continuous mobilisation and facilitation by Forest department and Panchayat of the area.

- **Tools: What implementation tools/ techniques have been used?**

The project largely relied on examined the possibilities of developing eco-friendly nutritive feed for freshwater prawns. Land for the project was provided free of cost by farmers and two ponds were developed throughout the project period. The first pond was a control site, where traditional methods were employed using commercial feed. The second pond was tested with alternative feed options and compared to the control for the health of the prawns and the water quality of the pond. Through the project, *Porterasia coarctata*, a locally available salt marsh grass, combined with soy bean dust, mustard oil cake, rice and wheat bran, with vitamins and minerals was found to be a viable alternative feed for the prawns. This had overall positive impact on the growth rates of the prawns as well as the water quality of the pond. The floral feed was also found to improve the colour of the prawns and regulate their final size. This positively impacted the market potential of the final product.

- **How the participatory approach used? What communities were involved in the process? In what ways?**
  Villagers were mobilised through local panchayat and were provided hands on training for producing the alternative natural feed for prawn from the local species of salt marsh grass. The villagers specially women were involved in developing nurseries for the local salt marsh grasses, which formed a major component of the alternative feed developed and suggested through the project. The land for initiative/study was also provided by farmers without any cost.

- **How are communities affected by the initiative (positively/negatively)?** The project had more of positive effect by offering an alternate source of income for the local community, reviving their traditional and locally available natural resource, thus improving the quality of their prawn and the water quality of the ponds in the region. It was a pilot scale project and as per information provided, the community got an economic return but the actual cost benefit ratio was not done. In addition to the above positive impacts new livelihood opportunities for local women were also generated through the project by developing nurseries for the salt marsh grass.
- **Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved?**

No controversy arises. As it was a pilot scale project and duration was short with targeted output, it was favoured by local villagers. More so ever, as it had participation of local community and the benefits of the initiatives were visible to the villagers, hence the issue of controversy generation did not arise.

- **What particular success/ difficulties did the implementation met with?**

  Upgradation of the water quality and the ecology of the water bodies such as reduction of the organic load and BOD and increase of the fresh water phytoplankton was achieved. The rate of viral diseases such as gill rot, thinning of skeleton of fishes also reduced through the initiative, which overall avoids the early death of such species and lead to their conservation.

  The project faced difficulties during rainy season due to absence of proper embankment of the water body, due to which the water used to overflow and enter in the nearby paddy field.

  More so, due to location of the site, accessibility was poor and hence problems were faced to transport or carry the important and costly scientific instrument to the site.

4. Outputs and Outcomes

- **What was achieved (or not) in practical terms, with regard to the following:**

  - **biodiversity conservation**: *Coscinodiscus sp*. a local species of phytoplankton was seen to be dominated.
  - **livelihood security and sustainability**: This project offered a alternative livelihood to the local community by developing nurseries of local variety of salt marsh grass, which could be used/sold as a natural prawn feed.
  - **Influencing policies/ decisions at a broader scale**: no such policy advocacy was attempted or achieved by the project.
  - **Changes in the perception of local communities towards conservation** The project served to generate large amount of interest from the local community, who understood the long-term benefits of switching feed. Based on the positive experiences coming out of the study, a guidebook in Bengali was developed for local farmers. The forest department and the local community is keen to upscale and promote this practice as it leaves the environment cleaner. This project has shown that science and research can overcome local concerns on environmental sustainability and enhance economic returns.

  - **Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation?** No the project was only a pilot demonstration and no further replication/scaling was attempted.

5. Discussion

The project worked as it involved local community in management of the biodiversity of the area. The project was designed on a model to use the locally available species of saltmarsh as a natural prawn feed instead of using the protein rich food such as meat and flesh of aquatic mussel which degraded the stability of the aquatic bodies. As the output of the project was very muc linked with increasing the productivity and quality (survival and size of the prawn) of the immediate/basic livelihood (i.e prawn farming) of the local villagers, hence it grasped a lot of interest and attention in the community. More so, the provision of getting an alternative livelihood through developing the new feed in their nurseries and selling/using them also made the project more acceptable.

The project has shown that science and research can overcome local concerns on environmental sustainability and enhance economic returns. The long-term viability of this project, despite the local level successes, will depend on the marketing of the intervention to coastal communities.

The project was replicated at Bonga, Swarupnagar in 2010-11 through IUCN funding. Any other replication did not happen due to absence of any policy level documentation/decision. The absence of infrastructure for seaweed culture and backup nursery of salt marsh grasses in other areas, are the reason for not attempting any further replication of this project.

PONDICHERRY

23. Evolving participatory community based fisheries management plans

Fisheries management along the coast of Puducherry is a major challenge with presence of multiple stakeholders accessing the marine fish resources. In 2010-11 the Dept. of Fisheries in Puducherry and Tamil Nadu initiated a project called Fisheries Management for Sustainable Livelihood (FIMSUL) with financial support from World Bank and technical support from FAO. The project demonstrates the importance of consultative and participatory approaches to arrive at solutions for fisheries management. This case presents results and impacts in Pondicherry. Based on the formal yet open discussions with the local fishing villages, the FIMSUL project helped the fishers as well as decision makers to understand better the gaps in current fisheries policy and management practices, including legal and institutional arrangements required for marine fisheries sector in Pondicherry. The overall impact has resulted in making efforts towards sustainable utilization of fish resources, streamlined procedures and ownership of fisheries schemes / programmes initiated by the Government.

Title: Evolving participatory community based fisheries management plans

Author(s): Mr. Shriji Kurup, CEE

Name of the State and study Location: Pondicherry, U.T., fishing villages of Pondicherry

Objective of the initiative/ project:

- To develop marine fisheries management plan for Pondicherry
- To involve the local fishing community for providing inputs to policy makers and arrive at best options for sustainable livelihoods in marine fisheries in Pondicherry

Implementers: Department of Fisheries, Pondicherry, NGOs – FERAL and SIFFS

Dates: 2010-11

1. Background information

The project sites are basically the coastline stretches of Pondicherry, particularly the nearshore coastal waters and the fishing villages. The fishing practices here use a range of fishing boats - the traditional non- catamarans, outboard motorized boats and trawlers. The fishing net and techniques also vary depending on the type of boat and fishing grounds. Increase in trawler vessels, improvised fishing nets are contributing towards decreased fish stock in the marine waters along Pondicherry coast. The traditional fishing villages have to invest more effort, time and money to harvest fish from nearshore waters. Consequently, there are instances of rifts between traditional and trawler boat owners. Government schemes too have not been able to address the fish stock management aspects, except for the annual seasonal 45 days ‘no fishing’ legal ban and doling out relief/ compensation to the fishers during that period of time. Most fishers therefore consider the Fisheries Department’s work as that of providing welfare and relief schemes. Their ownership in the formal marine fisheries management is negligible, their opinions and perspectives do not reflect in the local fisheries management plan, and they usually end up breaking the laws leading to further multi-stakeholder conflicts in the sector. This has overall resulted in decreasing fish stock, unregulated fishing, degradation of coastal habitat and biodiversity and entry of non-fishing livelihood activities occupying the coast. The fisheries department was therefore looking for a sustainable fisheries management plan that could be designed, developed, implemented and owned by the fishers rather than being a top-down approach.

2. General description of project / initiative / effort

In 2010, with support from World Bank and FAO, the Dept. of Fisheries, Pondicherry initiated a consultative mechanism of interacting with all the fishing villages in Pondicherry to deliberate on the issues related to fisheries management, policy gaps and priorities of the local community. The exercise was also carried out in fishing villages of Tamil Nadu through the Govt. of Tamil Nadu. Around 6 partner NGOs were engaged to conduct a detailed stakeholder and livelihood analysis which further helped in design and preparation of a systematic process of consultation with stakeholders from the field level up to an inter-state visioning session held in late 2011 that developed a Vision for Fisheries in Tamil Nadu and Puducherry to 2050. In Pondicherry the NGO Foundation for Ecological Research (FERAL) and South Indian Fisher Federation (SIFFS) facilitated the project in Pondicherry and Karaikal respectively. The project has resulted in significant improvements in the current fisheries management plans and helped decision makers to allocate funds in priority areas, resulting in generating a high level of buy-in and cooperation among the local community, primary stakeholders and institutions in the fisheries sector in Pondicherry.

3. Process of implementation

Initially, the project implementers – namely the Dept. of Fisheries, FAO consultants and the selected NGOs prepared outlined the plan of work and developed a framework to analyse the project results under 6 broad work packages that included – stakeholder analysis; livelihoods; policy development; institutional and legal framework; fisheries management system; knowledge management and future planning. Following the all the NGOs were trained in field observation and consultation methodologies and for the analysis of findings. In Pondicherry FERAL conducted household surveys and focused group discussions and with 15 marine fishing villages and other stakeholders while in Karaikal, SIFFS conducted in 10 marine fishing villages. District stakeholder consultations were also held. The field work was also supported by participation from the officials from the Fisheries Dept. of Pondicherry and local CBOs.

The analysis and findings from the field largely pertained to tracing seasonal dimensions of stakeholder livelihoods, how fishers responded to external changes – natural, economic, political etc., listing the opportunities and risks to their livelihood, future aspirations, relationships between multi-stakeholder groups, conflicts and coping mechanisms.

Later the findings were deliberated by the decision makers from the Government of Pondicherry, Tamil Nadu, experts, NGOs, and community leaders. Since, there were intricate inputs from the local fishing community, the decision makers could prioritize need based issues and design better fisheries management plans suiting the situation as well as sustainability issues. Notable management options dealt ranged from issues on diesel subsidies, bank loan system, technological innovations, marketing systems, insurance for fishing equipment, harbour facilities, agreement between Sri Lankan and Indian fishers for fishing harmoniously along coast, education and employment opportunities, regulations against banned fishing methods like Ring Seine and Pair trawling, housing or dwelling improvements, dignity of labour, dealing with debt, microfinance.

The final project reports were prepared and accepted by the Govt. of Puducherry and Tamil Nadu and the key recommendations and findings from the project acknowledged. The policy makers and government officials now have been able to incorporate important decisions in the existing marine fisheries management plans of the state using the Project findings. This has significantly led to better ownership and implementation of the plans by the local community and line departments.

4. Outputs and Outcomes

The project developed local capacities at an individual, organisational and institutional level amongst the fisheries department, NGOs and fisheries village leadership. The following outputs and outcomes were realized.

- Over 3000 stakeholders could be consulted from the marine fishing villages.
- A 15 point consolidated ‘Vision Statement’ for future of fisheries was produced and agreed by all stakeholders.
- The main future aspiration was: “Fishing Community livelihoods are secure and all individuals enjoy a sustained life, free of poverty”

- Co-management approaches were acknowledged as best management options while including traditional fisheries community structures as the building blocks for this approach.
- Reduce and control trawl fishing capacity
- Recommended amendments that should be brought into the Marine Fisheries Regulation Act (MFRA) for customizing fishing management as per distinct coastal requirements and sustainability options.
- Development of deep sea fishing be developed in stages using appropriate technology while maintaining sustainable yields. Similarly, mariculture as an alternate livelihood option could be explored.
- Securing rights of fishers, capacity building programs for fishers
- A Fisheries Reform Program to 2030 was proposed
- Fisheries management options for implementation by the Dept. of Fisheries.

5. Discussion

The project has successfully demonstrated that marine fish resources, overall biodiversity and marine fisheries livelihood can be sustainable management by designing robust fisheries management plans that are derived through intensive consultations with the primary stakeholders – the marine fisher folk. Policy formulation, institutional and legal arrangement, governance delivery mechanisms can be effectively enhanced by pursuing a participatory approach, field based analysis, and multi-stakeholder engagement. Marine and coastal management issues can be better addressed if there are efforts to develop a holistic vision and perspective development amongst different stakeholders using the same bio-resource and ecosystem space-services. It is important to communicate the issues, future scenario to the community and present them with the larger challenges that the administration is facing for managing the marine resources and protection of their livelihood. This helps in understanding the policy gaps and constraints that both administrators and community find in their area of influence. A mutual interest in solving the problem is a key factor that drives such projects, bring in ownership and better buy-in of the final policy and programme implementation objectives and methodologies. Co-management options for marine biodiversity conservation and sustainable utilization can be effectively pursued if similar consultative approaches as in the FIMSUL projects are taken up. The methodology followed in the FIMSUL project is unique, intensive and highly participatory with opportunities for voices from the community and local field realities to be heard, recorded and discussed. This is an important learning for policy makers and helps bring them closer to community concerns, being sensitive to their future aspirations and evolving policy options, management strategies that are more acceptable, voluntarily implemented and effectively monitored – overall leading to better marine fish stock management and sustaining the eco-system services vis-a-vis local livelihoods, food security and social benefits.

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ANDAMAN & NICOBAR

24. Towards building a community based fisheries monitoring methodologies for sustainable fisheries management and marine biodiversity conservation

The Andaman and Nicobar Islands have rich marine bio-resources that support a range of fisheries across the length of the islands. Fishers from different parts of India have been settled in these islands as a result of which there is a diversity of fisher folk communities in this region. Each community employs different fishing crafts and nets to target distinct groups of marine resources. The islands are thus characterised by multi-faceted fisheries, each demanding its own unique management approach.

Introduction of new fishing gears, live fish trade, long lining, grouper trade, threaten to dominate most of the island fisheries. Therefore, considering a need to develop a monitoring programme on the islands' fisheries to design relevant interventions DAKSHIN Foundation in collaboration with the Andaman and Nicobar Islands Environmental Team (ANET) developed a monitoring protocol and profile of the fisheries in the Andaman group of islands. The profile aims to characterise the fisheries in terms of the geographical and ecological zones of influence exerted by different fishing communities, following historical and current patterns of utilisation of key groups of species. The project helps to identify future research and conservation targets in fisheries management in these regions. It portrays the selfless efforts of environmentalists to engage actively with local fishers to bring in participatory methodologies and ownerships to sustainable fisheries management intervention and monitoring methodologies.

Title: Towards building a community based fisheries monitoring methodologies for sustainable fisheries management and marine biodiversity conservation

Author(s): Mr. Shriji Kurup, CEE

Name of the State and study Location: Andaman Islands

Objective of the initiative/ project:

To profile fisheries practices through monitoring commercial fish species and ecological indicators with involvement of community

Implementers: DAKSHIN Foundation and Andaman Nicobar Environment Team (ANET)

Dates: 2011-12

1. Background information

The project sites are located on the fishing villages and major fish landing centres of North, Middle and South Andamans. The Andaman Islands have historically been occupied by settlers from the mainland leading to a diversity of fishers and fishing techniques, gears based on their knowledge and also due to the unique marine ecological characteristics distinct to different parts of the island. Introduction of modern day gears further lead to rapid fish harvest, shifting the traditional practices of the existing fishers. There have been practically no studies to monitor how these diversified fisheries practices impact the fish stock and marine biodiversity in the islands.

2. General description of project / initiative / effort

The researchers from DAKSHIN and ANET initially developed a clear framework to arrive at the situational analysis, identify objectives for the project, clarify approaches for implementation and pin point important sites where the research study could be carried out. Further field work involved intensive meetings with the local fishers, local leaders and observation of their practices. The overall study results were then analysed and methodology developed whereby the fisher community too could participate and contribute to the observations. This paved way for a participatory research monitoring methodology, deriving critical field inputs and confidence about the results. The results are then used to communicate to the government and other conservation organizations about the critical challenges and future areas for research, the conservation priority topics specifically for improving fish stocks and sustainable harvest of commercially important fish varieties.

3. Process of implementation

The team of researchers from DAKSHIN Foundation and ANET were able to identify the gap in research inputs for sustainable fisheries management in the Andamans – particularly due to the impacts of the varied fisheries practices and advent of modern day fishing gears. This common concern resulted into a collaboration and brainstorming within themselves to develop a methodology that would be participatory in nature, principally engaging the fisher community and thereby get results to profile the zones around the islands that are under pressure and also identify conservation and sustainable fisheries management issues, challenges and solutions.

The project began by identifying priority sites of fishing villages and major fish landing centres along the coastline of Andaman Islands. Field work initially involved intensive consultations, meetings and one-to-one discussions with the fisher community along the coastline. They clearly communicated their objectives, purpose of the study and the rationale behind it. This was critical to generate interest amongst the fishers to perceive themselves as important players in this project, practically taking up the ownership for the observations and actively engaging in the monitoring protocols. Sustained interaction with the community was the key for the research team to gain their confidence and also rationalize their observations. Many important points from a community perspective emerged leading to a better understanding on why they took to a particular practice, how we (mainland decision makers) fail to see connections or perspectives of the community and overall build a long term association for conservation research with them.

At the end of the project, the researchers were able to map the geographical and ecological zones of influence exerted by the different fishing communities, following historical and current patterns of utilisation of key groups of species. The community immensely contributed to identify future research and conservation targets in fisheries management in these regions.

Following the success of the participatory approaches and participatory monitoring methodology developed for this project, the team has tried similar initiatives in other parts of the mainland coastline, collaborating with different partners but primarily trying to engage actively the fisher community in the research interventions.

The project has helped in informally sensitizing the local community to sustainable fisheries practices, reflect on the impact of their current fishing methods and together identify ecologically sensitive zones which they should be taking more care of. The project results need to be communicated to decision makers and conservation scientists to bring their attention to participatory monitoring methodologies, but this project has made the DAKSHIN and ANET team firmly believe in this participatory research approach for providing inputs for sustainable utilization of coastal bio resources and conservation of marine biodiversity.

4. Outputs and Outcomes

The project developed local capacities at an individual and community level in terms of gaining knowledge and skills for scientific monitoring methods combined with the use of their traditional knowledge. The following outputs and outcomes were realized.

- Profiling of geographical and ecological zones of influence exerted by the different fishing communities.
- Mapping the varied fishing practices, impacts on fish stock and influence of modern day fishing gears.

- Community participation in research work, particularly in making observations and discussing results.
- Developing participatory research methodologies for monitoring commercially important fish species.
- Identifying indicators and measurement techniques to check health of the marine and coastal ecosystem services.
- Informally, motivate the local fishers to be more vigilant about their practices and impacts on marine biodiversity, particularly the fish stock.
- Gain rich experience and confidence in investing in participatory research methods and project learnings for initiating similar interventions in other parts of the coastline, particularly in the mainland.
- Demonstrating collaborative research work and integration of institutional objectives, sharing of resources, knowledge and determination for undertaking difficult research work in remote marine and coastal areas and in difficult situations.
- Demonstrating how low cost but effective research work can be possible if the will to work in remote areas and with the community is ingrained in the project team and institutional thinking.

5. Discussion

The key success in this project was the participatory approach in monitoring the research parameters. The success of the methodology has encouraged DAKSHIN to collaborate with other partners and pursue community monitored research work, particularly for fisheries management and marine biodiversity conservation. Notable among these almost on similar methodology and participatory approach are their other projects like - Dugong Conservation in Andaman; Engaging fishers from Gulf of Mannar in monitoring fish catch; collaboration with College of Fisheries, Mangalore to develop methodologies to monitor nearshore fish catch, by catch by engaging local fishers as community observers/ researchers.

Elaborating on the key learnings from the Andaman project and also from the above mentioned interventions, Ms. Aarti Sridhar – senior researcher at DAKSHIN Foundation reflects that civil society organizations, research institutes and government line departments must increasingly invest their time and resources for evolving participatory research methodologies so that there is a mutual benefit derived – both for the decision makers, conservation ecologists and the community. The success of a project depends on the degree of mutual benefit; degree of selfless efforts and commitments by the researchers to be willing to work in remote areas, trying situations and with local community. Such efforts require sustained funding to keep the project cycle moving and also disseminate research results in more meaningful and applicable ways. The effort by DAKSHIN and ANET is now to encourage other organizations to design their projects based on participatory research methodologies. The notion that an alternate livelihood or an entry point activity is a must requirement to engage with communities must be relooked, as often the external project implementers find ways of abiding by guidelines and requirements of funding agencies and international good practice approaches. It is not always that community get attracted to incentives, but its more out of their necessity rather than a genuine interest. Research workers and NGOs would require sustained interaction and healthy dialogues with the community, being sensitive to their cultural and socio-economic perspectives to derive holistic thinking on biodiversity conservation solutions. While external project objectives may be to conserve biodiversity it is important that such projects make critical linkages with livelihood aspects to generate interest and relevance for the community. Communicating the connections are important for opening up dialogues from narrow specific issues to broader impacts and visioning exercise for the way to sustainable develop the future and meet their requirements through conservation of ecosystem services.

The project gives important learnings to approach and design research work (particularly in remote and inaccessible areas, in the nearshore coastal waters, and in the fisheries sector) with a sense of commitment to engage local community in research observations, discussions and monitoring methods leading to results that are grounded on field, consider local viewpoints, get wide acceptance and promote ownership for the work and future vision of marine biodiversity conservation.

References:

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- Annual Report, 2011-12, DAKSHIN Foundation

LAKSHWADEEP

25. Towards building a community based co-managed marine conservation reserve.

In the early 2000s, the coral reef ecosystem and two Giant Clam species (*Tridacna maxima*, *Tridacna squamosa*) of the Agatti island in Lakshadweep were under threat due to unsustainable fishing practices, tourist influx and lack of management plans. Therefore, in 2004, the Bombay Natural History Society (BNHS) and the Department of Environment, Govt. of Lakshadweep initiated a community perception study on their dependence on ecosystem goods and services and this led to designing a framework for education, communication and adaptive management for the major stakeholders - viz. the local community; the tourists; government officials. Subsequently several public consultations and mass awareness programs were held including communication of research results for sensitizing government officials on management aspects. Capacity building activities on eco-friendly fishing practices and eco-tourism were also imparted. Today, through a consultative process, the government and community have developed the Agatti island Co-Management Plan, Eco-Tourism Guidelines, and Giant Clam Species Conservation Plan and proposed Agatti island to be declared as India's first community-based co-managed marine conservation reserve.

Title: Towards building a community based co-managed marine conservation reserve.

Author(s): Mr. Shriji Kurup, CEE

Name of the State and study Location: Lakshadweep U.T.; Agatti Island

Objective of the initiative/ project:

- To conserve threatened Giant Clam species
- To capacity build local community and government officials towards co-managed conservation practices

Implementers: Bombay Natural History Society (BNHS) and the Department of Environment, Govt. of Lakshadweep

Dates: 2004 onwards

1. Background information

The project site is located on the Agatti islands – which is part of the Lakshadweep group of islands. It is an atoll formation and inhabited by tribal communities and local community. The main economic activities of the island include tuna fishing, coconut production and tourism. The fishers from Agatti use the traditional pole and line techniques to fish. Agatti brings in the second most tuna of all the islands. The Agatti island is very vulnerable to sea level rise impact due to climate change triggered by global warming. The Agatti island has rich coral biodiversity, including tuna fish resources. The major threatened species is the Giant Clam species - *Tridacna maxima* and *Tridacna squamosa*. They are included in the IUCN Invertebrate Red Data Book as conservation dependent and data deficient species, listed by CITES and protected under Schedule I of the Indian Wildlife (Protection) Act, 1972.

2. General description of project / initiative / effort

The need for initiating a project based on community-based marine protected area was triggered by the dwindling trend of bait fish population in the lagoons, a sign of reef degradation caused by several anthropogenic stresses. Further, the bait fishing techniques also affected the Giant Clam species. Therefore, a strategy was evolved to involve the local community in managing the fish resources and sustainable fishing techniques while also conserving the Giant Clam and coral biodiversity.

The Bombay Natural History Society (BNHS), the Department of Environment, Government of Lakshadweep and the local Panchayat were the partners in implementing this project. It began in 2004.

3. Process of implementation

The project began by conducting a needs assessment including capacity building needs of the local community. For this, around eight local community facilitators were chosen to undertake consultations with the local community. After significant training in various aspects of MPA management, and socioeconomic survey methodology, these facilitators then undertook a series of consultations from 2006 through March of 2008, in two phases. In the first phase over 80% of the adult population of ~16,000, were consulted through community meetings and household interactions.

Later, a series of documentaries and issue-based posters were prepared and used during community meetings, and traditional knowledge of natural resource use was systematically documented.

A group of individuals from the local community were also supported to attend the Reef Resilience workshop organized by IUCN and partners in Bentota, Sri Lanka in early 2007. The management plan concepts shared in the workshops were useful in developing the final management plan, and have improved the sustainability of the plan, helping make the MPA model more robust and responsive in the event of an emergency or crisis. Because the entire Project Giant Clam team is from the local community, community confidence was gained.

The stakeholders from the government departments – particularly the MPA managers / officials were oriented to the results on the giant clam monitoring and sensitized to the current and long term conservation needs. They were also trained in the management and conservation techniques.

Through a participatory discussion method, the project implementers designing Management (Policy Framework) for identifying and managing the protected area. Accordingly, MPA Management Plan, Eco-Tourism Guidelines, and Species Conservation Action Plan were developed in consultation with community after series of capacity building and training programs. These plans also consider climate change adaptations for the islands.

4. Outputs and Outcomes

The programme developed local capacities at an individual, organisational and institutional level. The following outputs and outcomes were realized.

- Integration of indigenous knowledge and credible research helped make the MPA management plan more inclusive.
- Community consent ensured volunteer implementation of MPA management plan goals until the time at which the government finalized the notification process.
- Community-managed conservation reserves are less vulnerable to political changes, and work effectively with very low operational costs.

- Community confidence was gained by using local residents to head up conservation efforts, and having them present their work at local and international seminars helped build trust among locals.
- Effective partnerships with various government offices can help in undertaking programs at different economical levels, with less than 15% administration costs (allowing more money to fund educational material and field work).
- Involvement of women, and the active participation of women groups, were critical parst of the Agatti Conservation Reserve process, ensuring that the project did not get derailed.
- The local community's high literacy rate (87%, third highest in India), and complete dependency on natural resources, helped communicate the message of resource conservation and management more effectively.
- During community consultation processes, staying politically neutral was key, and resulted in the unanimous support of the Agatti Conservation Reserve.
- Recent success and high support for MPA development is due to transparency of the process, integration of credible science, broad based consultations, reorganization of traditional knowledge and customary laws, and local capacity building.
- Engaging the community from the beginning of the project was vital for the project's success.

5. Discussion

The key success in this project was the educational approach to create capacities for conservation and sustainable use of the island biodiversity. It helped communities get engaged with the developmental issues of the island and seek their active participation in taking decisions pertaining to biodiversity conservation and livelihood. An extensive public interaction and exercise in understanding their perspectives and needs helped in prioritizing. Education helped in enhancing adaptive capacity of local community members by improving their livelihood, making their natural resource use more sustainable, and creating economic opportunities through eco-tourism.

The project offers important learnings in terms of how communities can be engaged in evolving marine biodiversity conservation plans, making the process participatory and co-managed. The activities in this project further contributes to the global biodiversity conservation targets to increase marine protected areas by 2020, particularly the Aichi Target 1, Target 4, Target 6, Target 11, Target 12, Target 16 (Ecotourism practice may be potential ABS model), Target 18, Target 19.

References:

i. Coral Reefs – A Reef Resilience Toolkit Module
http://www.reefresilience.org/Toolkit_Coral/C8_India.html (Accessed 24 October, 2013.)

ii. Vineeta Hoon and Idrees Babu, 2012, Socioeconomic Monitoring for Coastal Managers of South Asia: Field trials and Baseline Surveys Agatti Island, UT of Lakshadweep, CARESS/LMRCC, India

ANNEXURE 1 – WORKSHOP REPORT

GIZ-CEE Workshop
Documentation of good practices for coastal and marine biodiversity conservation and management in India

1st October, 2013; Ahmedabad

Background

The Indo-German project 'Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas' (CMPA) and Centre for Environment Education (CEE)is documenting good practices on marine and coastal biodiversity conservation and management from India. The objective is to derive learnings from these cases in order to help in better coastal and marine biodiversity management, particularly for existing and potential marine and coastal protected areas.

As part of this, a workshop was organized on 1st October, 2013 at CEE Head Office at Ahmedabad to finalize the criteria for screening cases and the format for preparing case studies, screen 50 cases (out of the listed 100) that merit further in-depth analysis and documentation as per the project requirements. Over 100 case listings of potential good practices from the coastal states/U.T. of India (identified through deskwork review by CEE) were shared during the workshop and further analysed and evaluated for short listing purpose.

Team members from GIZ and CEE participated in the workshop. The lists of participants are attached separately.

Proceedings

The workshop began with a welcome address by Dr. Shriji Kurup from CEE, followed by self-introductions by the participants. Dr. Jan Michael Vakily from GIZ then introduced the participants about Indo-German Biodiversity Programme; its objectives; broad outputs and measures for achieving the same. The focus was on strengthening participatory approaches; capacity building measures of key stakeholders and across selected CMPA sites; creating information, communication and training strategies for public relations and policy dialogue. The presentation helped the participants contextualize the current project with the broader goal of the programme and scope for it future use.

Subsequently, Dr. Neeraj Khera from GIZ gave a brief presentation about the current project on documentation of good practices on marine and coastal biodiversity conservation and management in India. She emphasized that the focus was to identify the good practices; locate the good sites; convey the examples of participatory approaches and derive learnings for key stakeholders – specifically for official from Government Department; NGOs; policy makers for facilitating better participatory and sustainable forms of coastal and marine conservation /management systems in India. The criteria for short-listing the cases were also highlighted in the presentation, including a format for helping in balancing the range of cases with respect to different parameters from different sites.

Pointing out the utility of the documentation report as a compendium of practices, she conveyed that it would serve as a useful strategy and activity to document local community and key stakeholders' perception and successful efforts for marine and coastal biodiversity conservation. It opens up avenues for using the documented material as training material; site

specific educational interventions; exposure visits and insights for promoting participatory approaches.

Followed by the initial presentation, Dr. Shriji Kurup briefly mentioned about the agenda for the workshop and requested for quick comments from the participants on the presentation made by the earlier speakers.

Specific observations and suggestions
Shri Kartikeya Sarabhai, Director, CEE appreciated the initiative by GIZ and pointed out his observations on the current documentation project. He emphasized the following:

i. It is important to document traditional practices of conservation and derive learnings on how to use it in the modern context. How such knowledge get ingrained in cultural practices and therefore help in conserving biodiversity over a larger period of time and sustain continuity of peoples participation, including ways of sustainable use of bio-resources. Local innovation on conservation could also be documented.

ii. Drawing examples from Vikaram Sarabhai Centre for Development Interaction (VIKSAT), he pointed out that VIKSAT had a lot of learnings on successful Joint Forest Management efforts in the terrestrial context, which involved close interaction and participation of community and tribal people. It would be important to see how such learnings on successful participatory conservation efforts from non-coastal landscape could be used in the coastal and marine context. It was important to make the connections, since a good model from the terrestrial system could be very well adapted in the coastal context; which might otherwise not be practiced/ available in the coastal areas. Also, the pitfalls faced in terrestrial setting may be avoided while designing and promoting new management systems in coastal areas.

He suggested that a separate Chapter on “Forests and conservation” or “How participatory approaches evolved” could be included in the documentation report to bring out these connections, value, contexts and learnings.

iii. It was important to bring out how policy frameworks have an impact on coastal and marine conservation efforts. Giving the example of public consultation that CEE facilitated for policy inputs on Coastal Management Zone Notification (CMZ 2008) and Coastal Regulation Zone Notification (2010), he highlighted that a policy like CMZ was which would had a tremendous impact on the coastal and marine biodiversity and landscape was very much opposed by the fisher community and subsequently the notification had to lapse. This was a case of how policies can substantially influence over a large scale and within a short time period the marine and coastal biodiversity of India. Such cases too should be documented.

Dr. Neena Koshy, GIZ pointed out that the efforts of fisher federations like the National Fish Workers Forum (NFF) was important to be highlighted – e.g. their role in voicing against CMZ, unionization of fish workers; policy-advocacy for Marine Fisheries Regulation Act; traditional fisher governance systems; impact of policy decisions on use of Turtle Excluder Devices (TED) etc.

Case presentation format
Subsequently, the Dr. Neeraj facilitated the discussion on the format of the case study presentation. Participants included some points which were added or clarified. The case presentation format is attached separately. The effort would be to try to document in the similar fashion to keep uniformity and serve the project purpose. The cases could also be shortlisted considering the feasibility and scope for documenting the information /process as per the presentation format. The case presentation format is enclosed separately.

Short-listing of cases

A one-page note on the criteria for short-listing the cases was discussed and consensus drawn on the parameters, although it was accepted that innovative cases or cases that have scope for significant learning should not be missed out. Participants then worked in groups of two to shortlist cases from particular state/U.T. as per the screening criteria. Copies of more than 100 case listings were circulated to each group. They noted reasons for selection / rejection and information gaps in the case listings. Later, the groups selected case listings were presented to all the participants. This discussion facilitated by Dr. Neeraj Khera and Dr. Shriji Kurup, essentially discussed in considerable detail about why a particular case was felt as confirmed or rejected. Further promising cases were also tentatively selected subject to information gap filling or cross checking. A worksheet to check the balancing and distribution of case across different themes, sites was also prepared.

General observations and comments during the discussion

- Several cases under traditional practices could be grouped together and mentioned in the Chapter on “Forests and Conservation” – e.g. Shravan Kavadia mangrove temple in Gujarat;
- Significant national efforts or efforts having a national impact could also be documented and mentioned separately – e.g. NFF efforts; CRZ public consultation; Community Conserved Areas – lobby by NGOs etc;
- The specific comments on cases that were tentatively selected but subject to having more information or cross-verification are mentioned and attached separately;
- Cases of endemic camel conservation – e.g. Sahajeevan NGO efforts to be included
- How CEE Beyt Dwarka Marine camp – over the years influenced critical thinking among specific participants to later help in marine conservation; how marine camping program can be effectively organized for outreach and experiential learning --- to be analyzed and reported by CEE – suggestion by Ramesh Savalia;
- Follow-up with NIO Goa on what follow-up happened on the ballast water invasive spp. studies in Mumbai port area – whether it was taken up with shipping or port authorities. --- follow-up Sujeet;
- How *Katkari* tribal population traditional practices help in biodiversity conservation – follow-up Sujeet;
- Clean beaches --- initiatives and public perception in Juhu and Chowpatty – urban context;
- State Kharland Development Board --- Cross check how inter-departmental and sectoral integration and planning is happening; how work is coordinated for conservation efforts – like mangrove cell etc.;
- NIO Goa study on ‘germplasm’ sites – 37 sites in Maharashtra – is it a case of genetic diversity conservation --- follow-up Sujeet;
- Cases on Community Genetic Bank – e.g. CMFRI interventions;
- Gujarat Reforestation effort in Jamnagar – cross verify – whether the existing spp. got threatened (under threatened category) due to the reforestation efforts --- follow-up Janki;
- SNEHA efforts against intensive aquaculture practice in Tamil Nadu – include;
- Titanium pollution along beaches in Trivandrum – check participatory citizen action method for conserving beach;
- Sacred Groves – coastal groves in Karnataka – include;
- Nethravathi Island – Navy conflict and Supreme court ruling – study;
- Aganahini – Rushikote Island – mangrove conservation – include;
- HSBC efforts – e.g. Earth-watch imitative and relevance in coastal areas – check;
- Turtle nesting sites in Maharashtra affected due to casuarinas plantations – check.

Outcome

Around 55-58 confirmed cases that could be used for documentation without further information/cross checking were shortlisted. Additionally, there are also tentative cases for which more information or cross checking may be required. Based on the initial short-listing of cases, the CEE team would try to get more information and develop the cases as per the case presentation format. A worksheet to record the type of cases, thematic areas, biodiversity conservation level, participatory stakeholders involved, site locations was also prepared. This would help in maintaining a balance among different cases and avoid repetitions.

It was felt that cases on 'genetic diversity' conservation need to be explored further. Also, for each case the climate change and disaster risk reduction integration may need to be analysed separately and mentioned while documenting the case, wherever scope is available.

The shortlisted cases and other related documents are enclosed separately.

List of participants:

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Enclosures:

1. Participant Registration sheet
2. Introductory presentation of project – GIZ
3. Agenda of workshop
4. Screening criteria – one-page note
5. Case presentation format
6. State/U.T. wise case listings scrutinized during workshop
7. Shortlisted and tentative case listings after workshop – state/U.T. wise
8. Balancing criteria for shortlisted cases - worksheet
9. Photographs of the workshop

Report prepared by:
Shriji Kurup, CEE

ANNEXURE -2 – SCREENING CRITERIA

Indo-German Biodiversity Programme

Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas in India (CSMMPA)

***Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH**

New Delhi, India

Case studies reflecting good practices in 'coastal and marine biodiversity conservation with a participatory approach'

The objective is to identify potential cases of good practices in coastal and marine biodiversity conservation, and develop the selected ones into case-studies using a pre-developed template. This set of case studies will reflect a diversity of sectors, thematic issues, habitats, species and geographical areas in India. The case studies will be used as the basic resources material for various capacity building measures in the project, and will also serve as an insightful material to draw examples for the site-specific measures under the project.

Criteria for screening:

1. The case clearly establishes the need/ importance /potential of participatory approaches
2. The case brings out the significance of biodiversity elements and their contribution to livelihood security/ climate change adaptation/ disaster risk reduction
3. An even representation of the sectors, thematic issues, habitats, species, states and sites in the case studies that are developed under the project (EXCEL SHEET ATTACHED)
4. There is a good possibility of collecting the required information (CASE STUDY FORMAT ATTACHED)

ANNEXURE – 3 – CASE STUDY FORMAT

Good practices

Coastal and marine biodiversity conservation with a participatory approach

----A 50-word summary of the case study----

Title:

Author(s):

Name of the State and study Location:

Objective of the initiative/ project:

Implementers:

Dates:

1. Background information

General:

- Details on the location/ geographical dimensions
- Kind of resource management, livelihood practices
- History: use of resources/ cultural practices / key events and projects

Conditions:

- climatic, geographical, ecological, socio-economic, demographic, cultural context
- Natural hazards and recent disasters in the area.
- Climate change vulnerability information for the area, if available

Coastal and marine biodiversity:

- Brief on the habitat, species and genetic diversity present in the area

2. General description of project / initiative / effort

- Purpose / objectives
- Implementing entity / partners
- Project / initiative duration

3. Process of implementation

- Actors: Who is involved in the process
- Tools: What implementation tools/ techniques have been used?
- How the participatory approach used? What communities were involved in the process? In what ways?
- How are communities affected by the initiative (positively/negatively)?
- Did the implementation of the project generate controversy? Why or why not? If there was controversy, what was it about? Was there any controversy within communities? How were the problems solved?
- What particular success/ difficulties did the implementation met with?

4. Outputs and Outcomes

What was achieved (or not) in practical terms, with regard to the following:

- biodiversity conservation
- livelihood security and sustainability
- Influencing policies/ decisions at a broader scale
- Changes in the perception of local communities towards conservation (How the local communities perceive the role of biodiversity for their livelihood security? Do they find the action useful? What changes have they observed?)
- Changed perception of decision makers/ development sector experts/ scientific community toward the role of local communities in coastal and marine biodiversity conservation
- Is the project / initiative / effort still on-going or not. If not, what lead to its discontinuation?

[use examples, direct quotes from local community/ officials/ development workers/ etc., indicators, etc. to provide clear evidence of results / impacts]

5. Discussion

- What worked and what didn't, why? Identify triggering factors or causes of success or failure, categorised into key priority issues for example governance (policies, legal frameworks), capacity development, individual, commitment / charisma, partnerships, institutional mechanisms, resource needs, etc.
- Sustainability: What is needed to maximize results and achieve sustainability?
- Replication: Can the process be easily replicated? How? (What changes are needed? Which factors have to be taken into account to allow replication?)
- Cost-effectiveness: what is the added value of this project or activity; if possible, include cost-benefit analysis or economic valuations
- If possible, compare to alternative solutions, i.e. the interventions without a participatory approach
- If possible, compare to similar initiatives implemented in other settings

6. Recommendations / Conclusions

- Summarize key lessons learned and priority areas of action
- Could also include forward-looking reflections, next steps and or immediate follow-up activities

Annexes

1) Photos, satellite images, maps, graphs and other visuals
2) Statistics
3) Related links
4) Related publications

About the Study

The subject of coastal and marine protected areas is relatively new. It is also a vast as stakeholders involved and spread in different sectors and geographical levels. In order to discuss any conservation strategy, it is therefore important to have a complete picture of the existing success and failure stories. It is in this background that the project engaged the Centre for Environment Education (CEE) to capture important, significant and valuable good practices from the coastal and marine areas in India. The study emerged from the need to compile information on such good practices as a compendium, in a manner that it can be used for planning and implementing potentially successful strategies on coastal and marine protected areas. This compendium provides an overview of 25 good practices from coastal states and union territories of India.

The CMPA Project

The Project "Conservation and Sustainable Management of Coastal and Marine Protected Areas" (CMPA) is a project of the Indo-German technical cooperation. It is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and implemented by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, and the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH* on behalf of BMUB.

Established to support the achievement of the Aichi targets of the Convention on Biological Diversity, the Project's overall goal is to contribute to conservation and sustainable use of biodiversity in selected areas along the coast of India. Taking into consideration the economic importance of the coastal zone for large segments of the population, the Project's approach is people-centered, thus ensuring the support for conservation by those depending on coastal ecosystems.

CMPA Technical Report Series

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A Compendium of Good Practices in Coastal and Marine Biodiversity Conservation in India

February 2014

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of:

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

of the Federal Republic of Germany

Indo-German Biodiversity Programme
Conservation and Sustainable Management of Coastal and Marine Protected Areas