

# RESPONSIBLE HARVESTING AND UTILISATION OF SELECTED SMALL PELAGICS AND FRESHWATER FISHES

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## Environmental and Social Safeguards Management

### A. Basic Information

<b>1</b>	<b>Project Statistics</b>			
	Project Code	Component 2		
	Consortium Leader	Dr.B.Meenakumari, Central Institute of Fisheries Technology, Cochin		
	Consortium PI	Shri.M.Nasser Principal Scientist		
	CoPIs	<b>Production</b>	<b>Processing</b>	<b>Marketing</b>
		Shri.M.Nasser Dr.M.R.Boopendranath Dr.Leela Edwin Dr.Saly N Thomas Dr.M.P.Remesan Shri. V.R. Madhu	Dr. P. T. Mathew Dr. K. V. Lalitha Dr. S. Sanjeev Dr. T. V. Sankar Dr.C.N. Ravishankar Dr. R. Anandan Dr.A.A.Zynudheen Dr.L.N.Murthy	Dr.S. Balasubramaniam Dr. V. Geethalakshmi Dr. Nikita Gopal Shri.J.Charles Jeeva
	Institution	Central Institute of Fisheries Technology		
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	Consortium Partner Institutions	<ul style="list-style-type: none"> <li>▪ Chellanam Kandakadavu Fishermen Welfare Development Co-operative Society, Chellanam, Kerala</li> <li>▪ Karnataka Fisheries Development Cooperation, Mangalore</li> <li>▪ Chellanam Panchayath SC/ST Service Co-operative Society Ltd., Chellanam, Kerala</li> </ul>		
<b>2</b>	<b>Date of Start</b>	January 1 <sup>st</sup> , 2008		

3	<b>Planned duration</b>	4.5 years
4	<b>Project Outlay</b>	Rs.9.71 Crores
5	<b>Objectives of the sub project</b>	<p><b>Production:</b> Optimisation of fishing craft and gear for cost-effective and responsible harvesting of marine small pelagics and freshwater fishes.</p> <p><b>Processing:</b> Development of a model processing system for total utilisation, product development, value addition, food safety and waste management for small pelagics and freshwater fishes.</p> <p><b>Marketing:</b> Development of marketing systems and strategies for small pelagics and freshwater fishes</p>

## 6. Brief Project Description

The NAIP value chain sub project on 'Responsible Harvesting and Utilization of Selected Small Pelagics and Freshwater Fishes' was initiated at CIFT, Cochin on January 1<sup>st</sup>, 2008. The technologies developed by CIFT is adapted under the project to integrate and develop an efficient value chain for the responsible harvesting and total utilization of small pelagics and freshwater fishes and to demonstrate a business model for the socio-economic benefit of the fisher folk. The project is being carried out in consortium mode with CIFT as the consortium lead centre and Cooperative Societies, Public Sector Undertaking and Private Enterprises, Government Fisheries Departments and NGOs as partners. Linkages with Fishermen Cooperatives, Private Industries, State Agriculture Universities, State Fisheries Departments, NGOs, State Apex Bodies and Self Help Groups have been developed. The ultimate aim of the project is the upliftment of the livelihood of the fishermen, dependent on the small pelagic and reservoir sectors who forms the lowest strata of the society, through technological interventions by improving and optimizing the harvest and post harvest systems in the ring seine sector of Chellanam, Kerala, *doi* net sector of Veraval, Gujarat and the gill net sector of Malampuzha Reservoir, Kerala.

The project aims to develop a business model to streamline production to consumption system for responsible harvesting of small pelagics and freshwater fishes. The project

objectives are drawn by dividing the whole value chain into three levels viz. Production, Processing and Marketing.

**Production:** The unbridled growth of the ring seine-fishing units necessitates the urgent implementation of technological measures for sustainable fisheries management. The huge capital investment of around Rs. 35 lakhs and the annual maintenance cost of about Rs.5 lakhs per fishing unit has driven the fishermen into a debt trap. Operational cost of a ring seine unit is almost 80-90% of the catch value generated. A CIFT study has estimated that fuel consumption expenses account for 68% of total operational cost of a ring seine unit. Right sizing of the craft and gear, selection of appropriate type and horse power of the engine and propulsion system and adoption of energy saving practices would help in reducing the capital investment and operational cost. Conservation oriented design changes are needed in the ring seine in order to reduce the incidence of juveniles in the catch, which at present is estimated at about 52%. So it is urgently required to standardise the fishing systems in terms of capacity, fishing power and energy use. It is envisaged that this project will deliver a ring seine of standard dimensions and mesh size. The capacity parameters of the craft in relation to length, draft, engine horsepower, gear handling and catch storage facilities will be standardised. The Bombay duck fishery is the backbone of the pelagic fishery of the northwest coastal region. A suitable fishing craft is required for more efficient harvesting of the catch. The dol net has to be modified to reduce the incidence of bycatch by adapting technologies already available with CIFT. The dol net fishing system needs to be standardised in terms of capacity, fishing power, onboard handling facility, and energy use.

The inland fish landings contribute more than 50% of the total fish landings. The gill nets are the major gear used for harvesting inland water bodies. There is no standard gill net for carps and catfish with reference to material, mesh size, dimensions and colour in these water bodies. Though the mesh size for some major species is fixed, adoption level is poor. Species-specific and size-selective gill nets have to be designed and the mesh sizes, gear size, fleet size and fishing height are to be standardised. In several reservoirs of the country there is no fishing craft, except for some contrivances like rubber tubes, raft, etc. Durable materials are to be introduced for construction of canoes in reservoirs besides introduction of new craft suitable to each reservoir in different states.

**Processing:** Utilization of the waste generated by processing of small pelagics and fresh water fish into useful products such as poultry/cattle/fish feed etc. will generate employment, increased revenue and socio economic upliftment of the fisheries sector. The project promotes value chain system in the fisheries sector, which will enhance the productivity, profitability, income and nutritional security of the population. It also aims to contribute to the optimum utilization of the above mentioned exploited fishery resources thereby deriving maximum benefits and enhancing synergy among the consortium partners and stake holders. Implementing the total quality system will ensure a safe food supply chain. HACCP standards and certification has become mandatory in export oriented fish processing industry, but the standards are yet to be formulated and implemented for pelagics and fresh water fisheries sectors from harvesting to consumption.

**Marketing:** The preferences of the consumers, especially in the urban areas, are undergoing drastic changes with increasing women employment and shift to ready-to-consume products. The success of any product depends on the acceptance of the product in the market. The technology for value added products that will be transferred has to be tested for its acceptance. Profitable marketing of the value added products developed needs focused strategies. Formation of post harvest clusters with the help of consortium partners to effectively add value to the resource and distribute has to be implemented so that a strategic partnership between the key players can be facilitated, besides enhancement of income and empowerment of women folk. Stakeholder consultations also revealed marketing as one of the major problem areas in the value chain for small pelagics and freshwater fish. The linkage of harvesting with the post harvest activities and marketing is to be ensured so that returns along the value chain are improved. The existing demand and supply scenario must be assessed to pinpoint the areas that need specific interventions in the form of new marketing strategies. As of now the producer sells as much as he produces as there is only limited value addition after the resource is landed and the buffer storage option is unavailable. Producing for the market will be possible if the demand forecasts are available as well as the requirement of the consumer in terms of quality and type of product is assessed. The consumer must get the product of desired quality, at a reasonable price and the availability should not be season-dependent. The supply and demand model can fill this

information gap. A Marketing Information System will also help the primary producer in taking decisions about effecting sales of their catches or opting for temporary storage.

## 7. Environmental category issues in the subproject

- Social
- Environmental

## 8. Safeguard policies triggered (World Bank Policies)

Safeguard Policies Triggered (World Bank Policies)		
No	Yes	
Environmental Assessment (OP/BP 4.01)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Natural Habitats (OP/BP 4.04)	<input type="checkbox"/>	<input type="checkbox"/>
Pest Management (OP 4.09)	<input type="checkbox"/>	<input type="checkbox"/>
Cultural Property (draft OP 4.11-OPN 11.03 -)	<input type="checkbox"/>	<input type="checkbox"/>
Involuntary Resettlement (OP/BP 4.12)	<input type="checkbox"/>	<input type="checkbox"/>
Indigenous Peoples (OD 4.20)	<input type="checkbox"/>	<input type="checkbox"/>
Forests (OP/BP 4.36)	<input type="checkbox"/>	<input type="checkbox"/>
Safety of Dams (OP/BP 4.37)	<input type="checkbox"/>	<input type="checkbox"/>
Projects in Disputed Areas (OP/BP 7.60)	<input type="checkbox"/>	<input type="checkbox"/>
Projects on International Waterways (OP/BP 7.50)	<input type="checkbox"/>	<input type="checkbox"/>

## ***B. Risk analysis and related issues***

### 9. Impact assessment

- New optimized gear designs may not be acceptable to the fishermen due large mesh size which would result in decreased yield
- Species specific gill nets may also be rejected by fishermen who depend on a multi species catch
- FRP boats when introduced may not be successful as adaptability to reservoir environment is not proven

- Energy efficient engines may be directly linked to reduced horse power which may be unacceptable to fishermen
- New propellers may not be accepted until proved efficient
- Packaging and processing techniques needs to updated regularly through training for fishermen
- Implementation of HACCP protocols at fishermen level will be expensive
- Hurdles in the development of value chain for value added products by way of middle men
- Lack of suitable means for large scale commercialization

**10. Potential indirect and/ or long-term Impacts due to anticipated future activities in the project areas (assessment of anticipated conflict/ complimentary with the current as well as those proposed for the next five years in the areas of activities of the sub-project):**

- Sustenance of the fishery by eliminating juvenile catch through optimization of fishing gear
- Improvement in energy efficiency
- Reduction in fishing effort
- Assurance of quality sea food through HACCP implementation
- New and varied varieties of value added products
- Employment for fisher women
- Enhanced income for fisher families

**11. Identify the key stakeholders and describe mechanisms for consultation with and to them done/ disclosure so far done including pre-project consultations with stake holders workshop before formulating the full proposal, discussing the full proposal with some stakeholders before submission to the PIU:**

**Public Institutes**

- Chellanam Kandakadavu Fishermen Welfare Development Cooperative Society, CKFWDCS
- Chellanam Panchayath SC/ST Service Cooperative Society, SCSTSC
- Karnataka Fisheries Development Corporation, KFDC
- Malampuzha Fishermen Cooperative Society, MFCS
- Trupti Sagar Society of Fishermen, TSSF

- Tamil Nadu Department of Fisheries, DTFN
- Kerala state co-operative federation for fisheries development ltd, Matsyafed, Kerala

#### **Private participation**

- Britto Exports, Chennai

#### **NGO**

- Kottapuram Integrated Development Society, Kottapuram, Kerala
- Gandhi Smaraka Grama Seva Kendram
- Mata Amritanandamayi Charitable Trust

#### **International Institutes**

- Fisheries and Marine Institute of the Memorial University of New Foundland, St. John's, Canada

### **12. Chronology of meetings/ activities held in connection with preparation of the concept note & full proposal**

<b>S.No.</b>	<b>Date &amp; Location</b>	<b>Programme</b>	<b>Participants</b>	<b>Remarks</b>
1	October 28, 2006; Kottapuram	Discussion with representative of KIDS	Fr. Johnson P.	How KIDS could associate in the proposed project was thoroughly discussed. (KIDS have organised training sessions in which CIFT has already provided training on value added fish products)
2	November 16, 2006; SL Puram, Arthungal	Discussion with representatives of GSGSK	CIFT team and representatives of GSGSK	Visited GSGSK for discussion on possible association in the project and visited Arthungal area to assess the fish drying activity being carried out there.
3	November 16, 2006; CIFT	Telephonic discussion with representative of KFDC	Mr. V.K. Shetty, MD, KFDC	Anticipated role of KFDC in the project was discussed and consent received
4	November 17, 2006; Vallikavu	Discussion with representative of MACT	Br. Prasanth P.	Their association in the proposed project was discussed. (MACT have organised training

				sessions in which CIFT has already provided training on value added fish products)
5	November 18, 2006; Chellanam	Meeting with Secretary, CKFWDCS	President and Secretary, CKFWDCS	Role of CKFWDCS in the project was identified and incorporated in the concept note
6	November 21, 2006; Chellanam	Discussion with members of SHGs, CKFWDCS	Members of local 10 SHGs (fisher women groups)	Problems in running the SHG activities profitably were identified.
7	November 23, 2006; CIFT	Discussion with ring seine fishermen	17 Ring seine fishermen groups	Operational problems discussed with fishermen. General socio-economic conditions assessed.
8	November 23; CIFT	Telephonic discussion with state govt. representatives, MATSYAFED	Mr. Joseph Manuel, MD, MATSYAFED Smt. Saira Banu, JD, Dept. of Fisheries Mt. Shaji. K. B., JD, Dept. of Fisheries	Agreed to give support for implementation of the project
9	November 23-24; CIFT	Telephonic discussion with representative of Forstar Insta Foods Pvt. Ltd.	Mr. S. G. Nair, MD and Mr. Mony Pillai, GM	Agreed to give support for implementation of the project
10	November 27, 2006	E-mail discussion with Dr. M. R. Raghunath, CIFA	Dr. M. R. Raghunath, Principal Scientist, CIFA, Bangalore	Work to be taken up at CIFA tentatively finalised
<b>Concept note submitted to NAIP on November 29, 2006</b>				
11	February 26, 2007; Malampuzha	Meeting with reservoir fishermen	Local fishermen	Traditional fishing systems in the reservoirs and technology needs assessed. Lack of proper craft gear for reservoir fishing noted
12	April 1, 2007; Jaisamand, Udaipur	Survey of craft and gear in Jaismand reservoir, Udaipur	Presidents of 5 Fishermen cooperatives of Jaisamand lake  Fishing contractor of the lake	Existing craft and gear being used in the reservoir surveyed. Problems facing the fishermen during fishing as well as social issues were noted

				Marketing issues were discussed with the contractor licensed by fisheries department to collect the fishes
13	April 5, 2007; Udaipur	Discussion on the possibility of conducting the proposed NAIP component on fresh water fishes at Jaisamand Lake based on the needs assessment made	Dr.L.L.Sharma, Head, Dept. of Aquaculture, MPUATFC  Dr.S.K.Sharma & Dr. B.K.Sharma Associate professors Dept. of Aquaculture MPUATFC	The MPUATFC has agreed to coordinate the programme at Udaipur and the modalities were worked out.
14	April 6, 2007; Udaipur	Discussion with State Fisheries Dept. officials	Sri. Ismail Ali Durga, Fishery Survey & Investigation Officer, Dept. of Fisheries, Rajasthan	Discussed the project component for Jaisamand Lake in detail and the State Fisheries Dept. has agreed to associate with the programme and extend all the help
15	May 1, 2007; Andhakaran-azhi, Cochin	Craft & Gear survey	Local ring seine fishermen groups and net makers	Current status of existing craft and gear reviewed Operational problems of existing fishing systems were discussed
16	May 5, 2007; CIFT, Cochin	Local stakeholder meeting	Representatives of CKFWDCS, KIDS, MATSYAFED, GSGSK, MACT, KFDC	Presented and discussed preliminary project plan and activities.  Feedback from the participants were noted and discussed for project refinement.
17	May 21, 2007; CIFT	Interaction with scientists for deciding work plan of consortium partner	President and Secretary, CKFWDCS	The work plan and participation expected from consortium partner discussed in detail
18	May 22, 2007; Jaffarabad	Interaction with <i>dol</i> net fishermen	President, office bearers and members of TSSF  25 <i>dol</i> net fishermen groups	Existing craft and gear of <i>dol</i> -net fishery surveyed and operational problems discussed  The drying techniques and associated problems for Bombay duck

				discussed. Marketing problems also identified.
19	May 23-25, 2007; Malampuzha	Interaction with reservoir fishermen	Members of MFCS	The work plan and participation expected from associate partner discussed in detail
20	May 29, 2007; Malampuzha	Interaction with reservoir fishermen	Members of MFCS	Assessment of marketing problems
21	May 30-31, 2007; CIFT, Cochin	Stakeholder workshop	NAIP Team, Project Team from CIFT, Consortium Partners-CKFWDCS, SCSTSC, KFDC, CIFA, MATSYAFED, GSGSK, KIDS, MACT, MFCS, TSSF, BAP, BRITTO, RFMO, MFC	Presentation of the complete project plan and stakeholder feedback. Feedback from NAIP team regarding changes to be made in the project to make it more focused.
22	June 5, 2007	Telephonic discussion with Dr. M. R. Raghunath, principal Scientist, CIFA	Dr. M. R. Raghunath, Principal Scientist, CIFA, Bangalore with Dr. T. V. Sankar, Senior Scientist, CIFT	Streamlining the work component of CIFA
23	June 8, 2007	Discussion with Dr. B.A Shamasundar, Professor, College of Fisheries, Mangalore	Dr. B.A Shamasundar, Professor, College of Fisheries, Mangalore with Dr. Srinivasa Gopal, Principal Scientist, CIFT	Streamlining the work component of College of Fisheries, Mangalore
24	June 14, 2007; Chellanam, Cochin	Stakeholder meeting	Meeting with wider group of stakeholders including women members of SHGs; CKFWDCS, SCSTSC	Streamlining of project activities and in depth discussion with fishermen about field level problems. Discussion with women SHG members about type of activities being done and proposed activities that can be undertaken in the project

25	June 18, 2007; Chellanam	Chellanam	Secretary, CKFWDCS and Secretary, SCSTSC	Streamlining of project activities of consortium partners
26	June 28, 2007; CIFT	Meeting with Sri. Harish Naik T, Technical Manager, Raj Fishmeal and Oil Company, Malpe	Sri. Harish Naik T, with Dr.T. V. Sankar	Streamlining of project activities of consortium partner
27	July 10, 2007; CIFT	Meeting with representative of Britto Exports	Mr. Christian, Chief Executive	Participation of Britto Exports in the uptake and upscaling of technologies for value addition discussed and participation in the project finalised
<b>First presentation of the Project before TAG-2 on 23<sup>rd</sup> August, 2007</b>				
28	September 6-8, 2007; Jafrabad and Navabunder (Gujarat)	Brain storming session on the problems and prospects of <i>dol</i> net fishery	President of TSSF  82 Fishermen operating <i>dol</i> nets	Elaborate discussions were held on how the problems of <i>dol</i> net fishery can be addressed under the project.

### 13. Measures to address the issues:

Refining technologies as per the stake holder requirements

### 14. Consultation/ disclosures to be done in future:

Similar meetings planned with stakeholders

Consortium PI

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National Coordinator

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National Director

## ANNEXURE I

### Environmental safeguard: Activities, issues, impact and mitigation measures

A. Environmental Safeguard					
No:	Activities (Interventions)	Issues	Anticipated level of impact		Mitigation Measures (Negative Impact)
			Positive	Negative	
<b>PRODUCTION</b>					
1	Reduction of fuel consumption in existing ring seiners and <i>dol</i> netters	Marine pollution ( CO <sub>2</sub> emissions)	4		
2	Improvement of onboard handling and onboard storage facilities in existing ring seiners and <i>dol</i> netters.				
	HACCP based handling and storage practices	Human health-through the food chain	4		
	Reduction of discards	Effect on agro biodiversity (fish)	4		
3	Optimisation of ring seines and <i>dol</i> nets (reduction in juvenile catch)	Effect on general-biodiversity (aquatic resource sustainability)	4		
4	Introduction of suitable craft for reservoir fishery.	Safety of fishermen	4		
5	Development of optimised gill nets for reservoirs (reduction in juvenile catch)	Effect on general-biodiversity (aquatic resource sustainability)	4		
6	Energy analysis of fishing systems (advisories to reduce energy use in fishing)	Misuse of energy	3		

PROCESSING					
1	Ready-to-cook, ready-to-serve, dried and other fish products	Generation of fish processing waste		4	Technology intervention for production of high protein animal feed from waste
2	Development and demonstration of energy efficient bulk drying methods	Human health-through the food chain	4		
3	Improved drying method for sardine, mackerel & anchovy	Human health-through the food chain	4		
4	Active food packaging for extension of shelf life of fresh, dried and processed fish products	Human health-through the food chain	3		
5	PUFA extraction from oil sardine	Human health – economical food supplements	4		
6	Ensilaging & feed formulation for livestock	Utilisation of waste	4		
7	HACCP implementation in fishing vessels, culture ponds, landing centres, auction centres, processing centres, sales outlets	Human health	4		
		Water quality	4		
		Soil contamination	4		
		Air pollutants	4		

## ANNEXURE II:

### Social safeguard: Activities, issues, impact and mitigation measures

B. Social Safeguard					
No:	Activities (Interventions)	Issues	Anticipated level of impact		Mitigation Measures (Negative Impact)
			<i>Positive</i>	<i>Negative</i>	
<b>PRODUCTION</b>					
1	Reduction of fuel consumption in existing ring seiners and <i>dol</i> netters	Long term profitability	3		
		Change in income pattern	3		
		Increased poverty and indebtedness	3		
2	Improvement of onboard handling and onboard storage facilities in existing ring seiners and <i>dol</i> netters.	Health and safety hazards	4		
3	Optimisation of ring seines and <i>dol</i> nets	Long term profitability	3		
		Change in income pattern	3		
4	Introduction of suitable craft for reservoir fishery.	Risk of life	5		
		Long term profitability	3		
		Health and safety hazards	3		
5	Development of optimised gill nets for reservoirs	Long term profitability	3		
6	Energy analysis of fishing systems	Long term profitability	3		
7	Demonstration and training of proven technologies	Effect on community ownership of natural resources and intellectual property	3		
		Marginisation and increasing disparities	3		

		Change in income patterns	3		
		Unequal access to inputs	3		
		Unemployment	3		
<b>PROCESSING</b>					
1	Demonstration and training of proven technologies to stakeholders	Unemployment	3		
		Increased poverty and indebtedness	3		
		Change in occupational pattern	3		
		Marginalisation and increased disparities	3		
		Effect on community ownership of natural resources and intellectual property	3		
		Long term profitability	3		
<b>MARKETING</b>					
1	Development of post harvest activity clusters	Unequal access to inputs	3		
		Marginalisation and increased disparities	3		
		Increased poverty and indebtedness	3		
		Increased workload for women	3		
		Change in occupational pattern	3		
		Health and safety hazards	3		

		Unemployment	3		
		Social conflicts: selection of cluster participants		3	Participatory approach will be followed in identifying participants with the help of consortium partners
2	Development of market information system	Long term profitability	3		
		Unemployment	3		
3	Development of marketing strategy for the products	Unemployment	3		
		Marginalisation and increased disparities	3		
4	Technology transfer programmes through training, awareness programmes, publications	Effect on community ownership of natural resources and intellectual property	3		
5	Impact assessment: socio- economic conditions of stakeholders, overall impact along the value chain	Improvement of social conditions by replication of the programme	4		