

**LIVELIHOOD AND MICRO-ENTERPRISE DEVELOPMENT OPPORTUNITIES  
FOR WOMEN IN COASTAL FISHING COMMUNITIES IN INDIA**

**Case studies of Orissa and Maharashtra**



Copies of FAO publications can be requested from:

Sales and Marketing Group

Communication Division

FAO

Viale delle Terme di Caracalla

00153 Rome, Italy

E-mail: [publications-sales@fao.org](mailto:publications-sales@fao.org)

Fax: (+39) 06 57053360

# **LIVELIHOOD AND MICRO-ENTERPRISE DEVELOPMENT OPPORTUNITIES FOR WOMEN IN COASTAL FISHING COMMUNITIES IN INDIA**

## **Case studies of Orissa and Maharashtra**

by

**U. Tietze**

FAO Consultant

**S. Siar**

Fishing Technology Service

FAO Fisheries and Aquaculture Department

**Suchitra M. Upare**

FAO Consultant

**M.A. Upare**

FAO Consultant

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the Food and Agriculture Organization of the United Nations in preference to others of a similar nature that are not mentioned.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to the Chief, Electronic Publishing Policy and Support Branch, Communication Division, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy or by e-mail to [copyright@fao.org](mailto:copyright@fao.org)

© FAO 2007

## **PREPARATION OF THIS DOCUMENT**

This FAO Fisheries Circular is based on the reports of studies carried out by partner institutions in the Indian States of Orissa and Maharashtra. The report also draws on the recommendations and observations of two state-level workshops, where the findings of the studies were discussed by fisheries and social scientists, representatives of fisheries and other concerned government agencies, fishermen and women associations and non-governmental organizations working with fishing communities.

The study on livelihood opportunities and microfinance support for women in coastal fishing communities in the State of Orissa, India, was carried out by NABARD Consultancy Services (NABCONS), the consultancy services unit of the National Bank for Agricultural and Rural Development of India. The study team consisted of M.A. Upare, team leader and General Manager at the NABARD Regional Office in Lucknow, Uttar Pradesh; M.K.Srivastava, Assistant General Manager, and Jayant Kumar Samal, Manager, at the NABARD Regional Office in Orissa.

The study on access of women in coastal Maharashtra to markets, credit and livelihood opportunities, was carried out by the Taraporevala Marine Biological Research Station of the Dr B.S. Konkan Agricultural University. The study team was headed by Dr R.K. Singh and Suchitra Upare.

This Fisheries Circular was written by Dr U. Tietze, consultant; Dr Susana V. Siar, FAO Fishery Industry Officer; Ms Suchitra M. Upare, consultant and Mr M.A. Upare, consultant.

Tietze, U., Siar, S., Upare, S. M. & Upare, M.A. 2007. *Livelihood and micro-enterprise development opportunities for women in coastal fishing communities in India – Case studies of Orissa and Maharashtra*. FAO Fisheries Circular. No. 1021. Rome, FAO. 69 p.

### ABSTRACT

The studies on livelihood and micro-enterprise development opportunities for women in coastal fishing communities in India are a follow-up to the national workshop on best practices in microfinance programmes for women in coastal fishing communities in India, held in Panaji, Goa, India, from 1 to 4 July 2003. The proceedings and outcomes of the workshop are reported in FAO Fisheries Report No. 724.

The studies found that poverty has remained a serious problem in fishing communities in Orissa and Maharashtra, made even more severe by the widespread absence of rural infrastructure and services such as safe drinking water, electricity, waste and sewage disposal facilities, health care and educational services and facilities, all-weather link roads as well as a lack of adequate housing facilities. Over the last two decades, fishing effort and the cost of fishing have considerably increased. Over the same period, a diversification of livelihoods of fisherfolk households has taken place, and many household members, particularly women, are now working part-time as unskilled agricultural labourers or construction workers.

In recent years, through the efforts of non-governmental organizations (NGOs), the marine wing of the Fisheries Department of Orissa and the initiative of other government departments, many women self-help groups (SHGs) and cooperatives have been formed and training has been provided to their members in the field of fish processing and marketing. Only a minority of the SHGs and cooperatives in Maharashtra and Orissa though, which have been formed in fishing communities, have so far been linked to financial institutions and there is a severe lack of rural fish storage and processing infrastructure and facilities.

The findings of the studies suggest that through actively promoting self-help groups and cooperatives among women in coastal fishing communities and through linking these associations with financial institutions, investment and working capital needs of their members can be met. To make the best use of capital inputs, SHGs and their federations need vocational and enterprise development training from NGOs and from fisheries training and research institutions as well as assistance for establishing links to new market outlets for their products, both domestically and for export. The state-level workshops in Orissa and Maharashtra made specific recommendations as to what kind of assistance is needed so that poverty in coastal fishing communities can be reduced and livelihoods improved and diversified through micro-enterprise development and microfinance and training support.

## CONTENTS

Preparation of this document	iii
Abstract	iv
Acronyms and abbreviations	vi
<b>1 Introduction</b>	<b>1</b>
<b>2 Opportunities for livelihood diversification and poverty alleviation through empowerment, micro-enterprise development, microfinance support and better market access</b>	<b>2</b>
2.1 Role of women in coastal fishing communities	2
2.2 Status of fisheries sector, infrastructure and services	3
2.3 Opportunities for improving and diversifying livelihoods in coastal fishing communities	6
<b>3 Findings and recommendations of the study on livelihood opportunities and microfinance support for women in coastal fishing communities in Orissa</b>	<b>9</b>
3.1 Objectives and method of study	9
3.2 Status of fisheries sector in Orissa	10
3.3 Self-help group movement and microfinance services	16
3.4 Assessment of livelihood opportunities for women in coastal fishing communities	21
3.5 Proceedings and recommendations of state-level workshop	26
<b>4 Findings and recommendations of the study on access of women in coastal Maharashtra to markets, credit and livelihood opportunities</b>	<b>27</b>
4.1 Objectives and method of study	27
4.2 Coastal fisheries development scenario in Maharashtra	28
4.3 Marketing patterns and microfinance services	33
4.4 Opportunities for livelihood diversification and poverty alleviation	38
4.5 Proceedings and recommendations of state-level workshop	39
<b>Annexes</b>	
I. List of participants of state-level workshop in Orissa	43
II. Programme of state-level workshop in Orissa	44
III. Action plan for empowerment of fisherwomen in Orissa	45
IV. List of participants of state-level workshop in Maharashtra	50
V. Programme of state-level workshop in Maharashtra	52
VI. Action plan for capacity building and empowerment of fisherwomen and their communities in Maharashtra	54
VII. Features and standard economics of fisheries related micro-enterprise opportunities for women in coastal fishing communities of Orissa and Maharashtra	58

## ACRONYMS AND ABBREVIATIONS

AsDB	Asian Development Bank
BFDA	Brackish water Fish Farmers' Development Agency
BMASS	Block Mahila Anchalik Sanchayika Sangh
CBI	Commercial Bank of India
CCB	Central Cooperative Bank
CDPO	Community Development Project Officer
CEO	Chief Executive Officer
CIFA	Central Institute of Freshwater Aquaculture
COFI	FAO Committee on Fisheries
DDM	District Development Manager
DMASS	District Mahila Anchalik Sanchayika Sangh
DRDA	District Rural Development Agency
DWCRA	Development of Women and Children in Rural Areas
EGS	Employment Guarantee Scheme
FAO	Food and Agriculture Organization of the United Nations
FFDA	Fish Farmer's Development Agency
FRP	Fibre Reinforced Plastic
GDP	Gross Domestic Product
GKY	Ganga Kalyan Yojana
GOI	Government of India
GOM	Government of Maharashtra
GP	Gram Panchayat
IFAD	International Fund for Agricultural Development
INR	Indian Rupee
IRV	Individual Rural Volunteer
LSS	Lok Sahayak Samiti
MIS	Management Information System
MFDC	Maharashtra Fisheries Development Corporation
MFI	Microfinance Intermediary
MPEDA	Marine Products Export Development Authority
NABARD	National Bank for Agriculture and Rural Development
NACA	Network of Aquaculture Centres in Asia-Pacific
NGO	Non-governmental Organization
NRCWA	National Research Centre for Women in Agriculture
NSS	National Sample Survey
O.i.C.	Officer-in-Charge
PRA	Participatory Rural Appraisal
RBI	Reserve Bank of India
REDP	Rural Entrepreneurship Development Programme
RIDF	Rural Infrastructure Development Fund
RMA	Rapid Market Appraisal
RRB	Regional Rural Bank
RSGB	Ratnagiri Sindhudurg Grameen Bank
SBI	State Bank of India
SC	Scheduled Caste
SDCCB	Sindhudurg District Central Cooperative Bank
SGSY	Swarnajayanti Gram Swarozgar Yojana
SHG	Self-help Group
SHPI	Self-help Promoting Institution
ST	Scheduled Tribe
STEP	Support to Training for Women Empowerment Programme
STW	Shallow Tube Well
UAA	United Artists' Association



UNFPA	United Nations Fund for Population Activities
VA	Village Association
VVV	Vikash Volunteer Vahini
WHO	World Health Organization



## 1. INTRODUCTION

Empirical studies<sup>1</sup> carried out from 1995 to 1998 in four Asian and two African countries under the UNFPA funded and FAO executed project “Strengthening of research and training on population and development dynamics of rural fishing communities” suggest that the numbers of full-time fisherfolk in some developing countries have started to stagnate and decline because of overexploitation of fisheries resources, competition with the commercial fisheries sector and because of the impact of government policies, which aim to reduce and limit fishing effort and to rehabilitate the coastal and aquatic environment.

The studies also show that in some countries and regions, occupational mobility and alternative employment opportunities have increased in rural areas owing to increasing levels of education and general economic development. In the states of Maharashtra and Orissa though, located on the east and west coast of India, respectively, poverty in coastal and inland fishing communities as well as in neighbouring agricultural villages is still a serious problem and there is also a serious lack of rural infrastructure and services including the supply of safe drinking water, electricity, waste and sewage disposal facilities, health care, education, roads, communication as well as a lack of adequate housing facilities.

The Twenty-sixth Session of the FAO Committee on Fisheries (COFI), held in Rome from 7 to 11 March 2005, noted a range of issues, which should be addressed so that small-scale fisheries can make a greater contribution to rural development, sustainable livelihoods, poverty alleviation and food security. The issues to be addressed include the lack of rural infrastructure and services, access to credit and microfinance services<sup>2</sup> as well as the reduction of post-harvest losses, better access to markets and adding value to fish and fish products through improved practices in the field of fish handling, preservation, processing and marketing.

The two studies, the findings of which are presented in this report, address the issues highlighted by COFI with particular emphasis on the access to credit and microfinance services and to post-harvest activities. The studies were carried out as a follow-up to the national workshop on best practices in microfinance programmes for women in coastal fishing communities in India, held in 2003<sup>3</sup>. The workshop was attended by representatives of central and state government fisheries administrations, financial institutions, fisheries research and training institutions, fishermen and women associations and NGOs.

The report is divided into three parts. The first part draws conclusions from both studies and provides guidance for future initiatives to improve the livelihoods of women in fishing communities and their families and households through strengthening and establishment of self-help groups, cooperatives and other forms of organizations, capacity building, training and support to enterprise development and generation of employment and through linking women and their associations to providers of credit and microfinance services.

---

<sup>1</sup> Tietze, U., Groenewold, G. & Marcoux, A. 2000. *Demographic change in coastal fishing communities and its implications for the coastal environment*. FAO Fisheries Technical Paper No. 403. Rome, FAO. 151p.

<sup>2</sup> Tietze, U., & Villareal, L.V. 2003. *Microfinance in fisheries and aquaculture - guidelines and case studies*. FAO Fisheries Technical Paper No. 440. Rome, FAO. 114p.

Dorsey, J.F., Ryhanen, P.A. & Tietze, U. 1989. *Revolving loan funds and credit programmes for fishing communities. Management guidelines*. Rome, FAO. 163p.

<sup>3</sup> Villareal, L.V. & Upare, M.A. 2003. *Report of the national workshop on best practices in microfinance programmes for women in coastal fishing communities in India*, 1–4 July 2003. FAO Fisheries Report No. 724. Rome, FAO. 50p.

The second part of the report presents the findings of the study on livelihood opportunities and microfinance support for women in coastal fishing communities in Orissa and summarises the proceedings of the state-level workshop, held in Bhubaneswar, where the findings and recommendations of the study were discussed and finalized by the concerned stakeholders in Orissa.

The third part of the report contains the findings of the study on access of women in coastal Maharashtra to markets, credit and livelihood opportunities followed by a summary of the proceedings of the state-level workshop, held in Mumbai, where the findings and recommendations of the study were discussed and finalized by the concerned stakeholders in Maharashtra.

The annexes to the report provide information on the participants and programmes of the state-level workshops held in Bhubaneswar and Mumbai and on the action plans, which were presented and adopted at the workshops. Annex VII of the report describes the standard economics of the fisheries related micro-enterprise opportunities for women in coastal fishing communities of Orissa and Maharashtra, which were identified by the studies.

## **2. OPPORTUNITIES FOR LIVELIHOOD DIVERSIFICATION AND POVERTY ALLEVIATION THROUGH EMPOWERMENT, MICRO-ENTERPRISE DEVELOPMENT, MICROFINANCE SUPPORT AND BETTER MARKET ACCESS**

The studies on livelihoods of women in coastal fishing communities of India and on their access to microfinance and markets were carried out in two Indian states, which greatly differ according to their geographic location and macro-economic environment. Maharashtra is located on the west coast of India on the Arabian Sea and belongs to the most developed states of India according to macro-economic indicators while Orissa is one of the least developed states of India located on the east coast bordering the Bay of Bengal.

The findings of both studies suggest that regardless of these differences, the situation of women in coastal fishing communities in both states shows many similarities. The opportunities for poverty alleviation and livelihood diversification, which were identified by the studies, have much in common, too.

One of the reasons why the situation of coastal fisherfolk in Maharashtra and Orissa does not reflect the macro-economic differences in the level of development between the two states is probably that the macro-economic indicators largely reflect urban, commercial and industrial development while the situation in rural coastal areas has not changed as much.

### **2.1 Role of women in coastal fishing communities**

Both in Maharashtra and in Orissa<sup>4</sup>, poverty is still a widespread phenomenon in rural fishing communities. As in the past, the status of women is still characterized by low nutritional and health standards. The division of labour discriminates against women. In many cases, traditional norms and values discriminate against the participation of women in decision making in family and community. Women in fishing communities have low levels of education, a lack of access to and control over productive assets as well as a lack of investment and working capital. Women also lack access to markets and rural infrastructure, credit and microfinance services.

---

<sup>4</sup> Venkatesh, S. 2006. *Trends in Poverty and Livelihoods in Coastal Fishing Communities of Orissa State, India*. FAO Fisheries Technical Paper No. 490. Rome, FAO. 111p.

For India as a whole, it has been estimated that women account for 25 percent of the workforce in fishing and fish farming, for 60 percent of the workforce in export oriented fish and shellfish processing and for 40 percent of the workforce in domestic fish marketing. Altogether, about half a million women are involved in harvest and post-harvest operations in the Indian fisheries sector.

While there are differences between fishing communities depending on local culture, religious beliefs and other factors, both in Maharashtra and Orissa, women are traditionally involved in the processing and marketing of the catch, in net making and repair and participate in a limited way in capture fishing activities such as the operation of shore seines, the collection of shellfish and seaweed in tidal areas and in fishing operations in estuaries, rivers and backwaters. Women are also actively involved in fish farming, fish pond construction, fish feed preparation and in the management of fish ponds. In addition, women traditionally take care of all family and household needs by looking after children and the elderly, procuring and preparing food for all household members, managing family finances, collecting firewood, fetching water and carrying out all other essential household chores.<sup>5</sup>

Modernization and changes of the fishing industry over the last few decades, both in Maharashtra and Orissa, had gender specific consequences and caused the role of women in fishing communities to change. Motorization and mechanization of fishing vessels led to a concentration of fish landings at fewer harbours and landing sites and, in some cases, resulted in the takeover of fish trade by male fish merchants. This process displaced many women from the retailing of fish. There are exceptions though to this general trend, which suggest that local culture and religious beliefs still have a role to play. The study in Maharashtra found that women fish traders dominate fish marketing in the only landing site for commercial purse seiners in Mirkarwada in Ratnagiri district of Maharashtra, where most of the fishing vessels are owned by Muslim families.

A growing seafood export processing industry employs largely women from outside the fishing community. Women from the fishing community, who manage to enter the modern export oriented fish processing sector, are no longer self-employed but become wage earners with no control over the use of their time. These women can no longer combine the roles they used to play in their family and in fish processing as they now have to stay far away from their homes for long periods of time. In many cases, working conditions of women are poor and the wages are lower than the wages of men doing similar work.

Because of improved transportation and infrastructure, the production and marketing of dried fish has declined as more fish is being marketed and consumed in fresh form. As a result, employment of women in fish drying has been reduced. Likewise the advent of net making machines and the use of machine made nets have reduced the employment of women in net making. In recent years in the course of the diversification of livelihoods of traditional fisherfolk households caused, among other things, by competition from the medium and large-scale fishery sector and by the over-exploitation of fishery resources, the workload of women in fishing communities has increased and forced many women to work as agricultural labourers, construction workers and to take up other types of unskilled employment in addition to their already heavy workload.

## **2.2 Status of fisheries sector, infrastructure and services**

In Maharashtra, the marine fisheries production has started to stagnate in the 1990s and there have only been small increases in the total marine production in recent years. While the relative contribution of commercial fishing vessels to the total marine production is increasing, a relative and absolute decline of catches is being experienced by the small-scale coastal fisheries sector.

---

<sup>5</sup> Haque, F. & Tietze, U. 1988. *Women in fishing communities. A special target groups of development projects*. Guidelines. Rome, FAO. 63p.

### ***Decline of catches, fishing restrictions and pervasiveness of poverty***

The main reasons for the declining catches and contribution of the small-scale fisheries sector to the marine fisheries production in Maharashtra is attributed to an increasing number of commercial trawlers, use of more efficient and sometimes destructive fishing gear and to the pollution of coastal waters caused by the inflow of agricultural chemicals and fertilizers, industrial waste, storm waters from urban areas, siltation, discharge of waste from towns, discharge of oil from ships and by other sources of pollution.

While the role of the small-scale fisheries sector in Maharashtra has declined, the development of alternative livelihoods has been slow and not been able to compensate for lost employment and income. As a result, poverty in coastal fishing communities is a serious problem. The percentage of the population living under the poverty line in the coastal rural blocks of Thane district, Sindhudurg district and Ratnagiri district is as high as 52, 43 and 37 percent, respectively, compared to an all India poverty ratio of 27 percent.

In Orissa, most of the fishery resources accessible to the presently operating fishing fleet are fully exploited. As in the case of Maharashtra, the total marine fisheries production is stagnating and the share of the traditional small-scale sector has declined while the number of commercial and mechanized fishing vessels and their share of the total catch have increased.

The situation of the coastal small-scale fisheries sector is further aggravated by various restrictions on fishing in coastal waters, which have been introduced by the Government of Orissa related to the protection of sea turtles and to a missile testing range on the northern coastline of the state. All these restrictions have a negative impact on the livelihoods of coastal fishing communities in Orissa, where the vast majority of fisherfolk falls below the poverty line.

### ***Lack of post-harvest infrastructure***

While there has been a considerable development of infrastructure in urban centres of Maharashtra and to a lesser extent of Orissa, rural areas have been comparatively neglected including the coastal areas of both states.

Despite infrastructure improvements in rural areas in Maharashtra related to transport and electricity during the 1990s, local and urban markets, where fish and fish products are landed and sold, often lack basic infrastructure. This includes an absence of concrete floors and ceilings; a lack of storage, cold storage and fish handling and transport facilities; an irregular supply of electricity and lack of generators to be used during power outages; a lack of supply of clean and safe water; a lack of drainages and solid waste disposal facilities and a lack of hygienic facilities such as bathrooms and latrines. The situation is similar in Orissa. The condition of fish landing centres and sites in coastal villages is even worse. There is also a lack of regulations pertaining to the marketing of fish and fish products and of the monitoring of regulations including health regulations.

Remote areas of the coastal districts of both states still face accessibility problems, particularly during rainy season and natural calamities, because they do not have all-weather roads and public transport services. In some coastal towns, it is difficult to access major wholesale markets because of inadequate and congested roads.

Fish moves relatively fast through the marketing chain because of a strong demand and only small physical losses were observed during the study. There is, however, a considerable loss of quality of fish because of unhygienic handling, storage and transport of fish at fish landing centres and in fish markets and because not enough ice is used to preserve the catch on board fishing vessels before landing it.

This loss of quality of raw material poses an obstacle to the production of value added fish products. An example is the export of dried fish. There is an unexploited potential for dried fish exports to overseas markets, particularly in the Middle East. Traders complain about a lack of dried fish, which

can be exported. The poor quality is largely due to the poor quality of the raw material used and the lack of hygienic fish handling, marketing, processing and transport infrastructure. By improving fish handling and processing and improving the hygiene and quality of fish drying by small-scale fish processors, additional income can be generated for coastal fishing communities.

### ***Lack of market access***

When comparing the prices paid to fishermen to the profits of intermediaries in Maharashtra, the study found that prices paid to fishermen seemed relatively low. In some marketing channels, the profits earned by both wholesalers and retailers, after deducting their costs, are higher than the prices paid to fishermen, which also have to cover their costs of operation and capital. In the export oriented marketing channel, the profits earned by commission agents and wholesalers account for as much 41 percent of the price paid by exporters while the price paid to fishermen accounts only for 8 percent.

A similar situation prevails in Orissa. The reason for the low prices paid to producers is related to the fact that wholesalers and commission agents also provide loans to fishermen to cover their costs of operation. In return, fishermen are required to sell their catch to these wholesalers and commission agents at a price agreed on when receiving the loan. This price is usually below the common market rate. Cooperatives do not play a role in fish marketing. They also do not provide working capital loans and advances to their members. Cooperatives have restricted their role to selling fishery inputs like diesel, net making materials, antifouling bottom paints and engine spare parts.

### ***Self-help groups and associations***

Self-help groups and associations can play an important role in helping fisherfolk to improve their livelihoods, representing their concerns to government agencies and other stakeholders and gaining access to microfinance and other support services.

The study in Orissa found that the number of SHGs in fishing communities is increasing with the active support of NGOs, banks and government agencies, which are also providing support to women cooperatives in the field of training for fisheries related self-employment. In Maharashtra, self-help groups in fishing villages are less common as in Orissa and most of the fisherwomen and fishermen cooperatives are not active.

Both studies suggest that there is a need for capacity building measures for members and functionaries of SHGs in the field of vocational training, micro-enterprise promotion and support services through the coordinated efforts of banks, NGOs and government agencies.

### ***Lack of access to institutional credit***

The lack of financial resources and access to sources of credit needed for investments in productive assets, to meet operational expenses and to cover consumption needs during periods with little or no income figured prominently among the problems and livelihood constraints identified by members of fishing communities during the participatory appraisals carried out in coastal villages of Maharashtra and Orissa.

This situation prevails in fishing communities, even though banks, in cooperation with NGOs and government agencies, have expanded their microfinance programmes in many rural areas of Orissa and in coastal areas of Maharashtra. It was also observed in the case of Maharashtra that as a result of the expansion of institutional microfinance, interest rates charged by local moneylenders and traders have declined.

### ***Lack of government services***

Many of the issues raised by members of fishing communities and other stakeholders during the participatory appraisals carried out in Maharashtra and to a lesser extent in Orissa point to weak local governance.

In Maharashtra, the current situation is characterised by a lack of clear policies and by an inadequate autonomy of local government authorities. State government extension services related to the small-scale fisheries sector and to health and education are considered inadequate. This finding is to be interpreted in the context of the many on-going government sponsored schemes in support of fishing and fish farming in Maharashtra and suggests that the actual implementation of the schemes is not fully satisfactory.

Members of fishing communities and other stakeholders in Maharashtra also felt that present government policies do not address the issue of poverty adequately. Likewise there was a general feeling that the concerns of the coastal areas of Maharashtra are not being paid adequate attention by the state government and that the fisheries sector of the state is neglected in terms of allocation of resources as compared to other sectors. It was further observed that government policies, which could be beneficial, are not properly implemented at the field level and thus do not have the desired impact.

### **2.3 Opportunities for improving and diversifying livelihoods in coastal fishing communities**

With a view to reduce poverty in coastal fishing communities of Maharashtra and Orissa, the studies identify a variety of opportunities for the diversification and improvement of livelihoods of women in fishing communities. The studies also propose specific measures, which can be taken by members and functionaries of self-help groups and their federations, fisherwomen and fishermen cooperatives, by NGOs, banks, state and local government agencies, fisheries training and research institutions and other stakeholders.

These measures aim to strengthen the capacity of women and fishermen groups and associations and to expand the self-help group movement in fishing communities; to promote employment and the development of fisheries related and non-fisheries micro-enterprises and to provide training and small-scale business development support; to link fisherwomen and fishermen SHGs and associations to financial institutions for the purpose of accessing credit for capital, working capital and other requirements; to improve post-harvest and other rural infrastructure and government services and to consider the concerns of rural fishing communities in the management and conservation of fisheries resources and the coastal environment.

While the detailed findings and recommendations of each of the studies are described in chapters three and four of this report, some common conclusions, which can be drawn from the studies, are highlighted in this chapter.

#### ***Decline of catches, fishing restrictions and the pervasiveness of poverty***

To address issues such as the decline of catches and fishing restrictions and the pervasiveness of poverty in fishing communities, both studies suggest that coastal fishing communities should be consulted and involved in the management and conservation of fisheries resources and the coastal environment. In the case of Orissa, the study proposes that coastal fishing communities and their representatives should participate in the ongoing review of fisheries and coastal management policies in Orissa related to the protection of sea turtles and other issues as well as in the design, implementation and monitoring of future management programmes and measures.

In the case of Maharashtra, the study proposes to involve coastal fishing communities in decision making regarding fisheries management and to more effectively regulate and monitor industrial trawling. Stricter pollution controls are recommended as well as a scientific assessment and monitoring of fish stocks and changes of the natural aquatic and coastal habitat.



Both studies also emphasize strongly the need for the creation of alternative income and employment opportunities for those who are forced to reduce their fishery related economic activities or to leave the fisheries sector altogether because of declining fishery resources and fisheries management regulations.

In this context, the study carried out in Orissa observed that the Government of Orissa already plays a role in allocating public water bodies such as village tanks, which are suitable for fish farming, to women self-help groups. It is recommended to expand the lease periods for these water bodies to more than five years and to take policy initiatives for leasing out government land suitable for brackish water prawn and fish farming to women SHGs on a priority basis.

### ***Alternative income generating activities and micro-enterprises***

Based on an assessment of locally available raw materials and existing practices, resources and skills, support from training and extension agencies and financial institutions, existing market demand and opportunities for the development of new markets and other factors, the studies identified a number of fisheries related and non-fisheries micro-enterprises and income generating activities, which can be taken up by women in coastal fishing communities in coastal Maharashtra and Orissa.

This includes micro-enterprises in the field of small-scale fish, prawn, shellfish and crustacean farming, sometimes integrated with other activities such as composite fish farming in existing tanks, fish seed rearing in seasonal tanks, small-scale breeding of ornamental fish, artemia culture, integrated fish and poultry farming, composite fish and freshwater prawn farming in newly excavated tanks, freshwater prawn farming in existing tanks, brackish water prawn farming, mud crab fattening as well as raft culture of mussels.

In the field of post-harvest activities, the operation of small-scale fish drying plants was identified as an opportunity for value addition and to cater to more remunerative markets including export markets. Annex VII shows the expected costs and revenues of above micro-enterprises and the required inputs and outputs. Both studies cooperated in standardizing the proposed micro-enterprises, which explains, why the standard economics of fisheries related micro-enterprises suitable to be undertaken in both states are identical. The standard economics are models, which should be adapted to the particular locality and circumstances, where the particular enterprise will be undertaken. Some of these models are based on earlier work undertaken by NABARD.

Other value added fish products, which can be produced and sold by women in fishing communities, include fish pickles, fish cutlets, fish wafers, fish balls, fish fingers and similar ready-to-eat products.

In the field of coastal horticulture and forestry, three activities were found suitable to be undertaken by women in coastal villages, i.e. the cultivation of coconuts, the cultivation of cashew nuts and the cultivation of casuarina trees. The latter activity also helps to protect seashores from soil erosion and coastal settlements from cyclones, tsunamis and other natural disasters.

In addition to above activities, a number of non-farm sector income generating activities were identified by the study in Orissa. These include the production of shellcraft items, weaving of fishing nets, production of palm leaf and bamboo based utility items as well as retail activities such as the sale of diesel and kerosene to fishermen.

Additional income generating activities, which were identified by the study in Maharashtra, include the collection of wild sea bass, mullet fry, penaeid prawn and freshwater prawn seed to be sold to fish farmers; the manufacturing and repair of cast nets, demersal and pelagic trawl nets, purse seine nets, dolnets; animal husbandry with pigs, goats, cows and production of dairy products; growing/cultivation of fruits, vegetables, fodder, flowers and plants with medical properties by using minor irrigation techniques; brick making; making bamboo articles; quarrying laterite stones; fruit and cashew nut processing; agro-tourism and transportation; carpentry; operation of food stalls and small village restaurants and various types of retail activities.

### ***Post-harvest and rural infrastructure***

Both studies stress that the improvement of infrastructure in rural coastal areas such as roads and supply of electricity should be a government priority. The studies also highlight that upgrading of market infrastructure, where fish can be sold, is urgently required.

Besides government initiatives, infrastructure upgrading may take place through private and public sector construction of low cost cold storage facilities. This may require incentives for private investors in the form of reduced interest rates from government banks. Continued efforts are required to improve the transport system, i.e. feeder and community access roads and ferry crossings. Fish landing centres should be upgraded through local government and community initiatives.

In the case of Orissa, it was found that many coastal fishing villages lack essential rural infrastructure such as all weather roads, safe drinking water, electricity, appropriate fish landing centres, sanitary and solid waste disposal facilities, health, educational and other infrastructure. It was highlighted that this lack of infrastructure has a very negative impact on the livelihoods of coastal fisherfolk. The study proposed that the Government of Orissa avails itself of funding from NABARD's Rural Infrastructure Development Fund (RIDF) for providing infrastructure facilities to coastal fishing villages.

### ***Fish marketing***

In order to increase the share of fishermen and women in the price paid by consumers and exporters, a strengthening of the role of fisheries cooperatives in fish marketing and post-harvest operations is considered necessary, particularly by the study carried out in Maharashtra. This would require, however, substantial changes in the functioning of fisheries cooperatives.

The changes would include a better control of fisherfolk over their cooperatives through their elected representatives. Business activities are to be managed by professional managers with adequate operational freedom while being accountable to the members of the cooperative for their performance. Cooperatives should remain free of government intervention in their day-to-day functioning. Fisheries cooperatives should expand their role in post-harvest and value added fish processing activities and acquire their own infrastructure.

Last but not least, it is recommended by the study carried out in Maharashtra to establish fish marketing committees similar to agricultural market committees in order to ensure minimum prices for fish and fish products.

### ***Expansion and strengthening of SHGs and their access to microfinance***

Both studies emphasize the need to expand and strengthen the SHG movement among fishing communities and particularly among women. According to the studies, a key to the expansion and strengthening of SHGs and their access to microfinance is the sensitization of branch level as well as senior level bank staff regarding the concept of SHGs and operational guidelines on lending to SHGs. It was also observed that many SHGs promoted by NGOs, government agencies, farmers' clubs and banks themselves have not yet received bank loans. In the light of this situation, it is proposed that banks should give priority to SHGs, which have already started internal lending to their members using their own funds.

There is also a need for sensitizing fisherwomen as many fisherwomen are presently not aware of the self-help group movement. Information campaigns and awareness building programmes need to be conducted and there is a need to find new partners, who are willing to function as self-help promoting institutions (SHPIs). Departments of fisheries, fish farmers' development agencies (FFDAs), brackish water farmers' development agencies (BFDAs), regional rural banks (RRBs), central cooperative banks (CCBs), NGOs as well as individuals all need to be encouraged and should consider playing a role as SHPI with regard to the expansion of the self-help group movement in coastal districts.

Capacity building and training in the management of SHGs, small-scale business and financial management and in the technical, vocational and operational aspects of various types of enterprises are crucial. Other measures, which are recommended for the strengthening of self-help group and microfinance linkages, are to waive the stamp duty for SHGs, a close monitoring of the progress at various levels of the implementation of the SHG–bank linkage programme and mandatory reporting of progress by banks to the Reserve Bank of India as well as regular support to the programme by concerned state government departments such as the Women and Child Welfare Department under the Ministry of Human Resource Development, the Social Welfare Department, the State Dairy Federation, the Agriculture Department and the Cooperation Department, which are all mandated to promote the formation of SHGs.

It is further suggested that SHGs need to be classified and rated according to their maturity and eligibility to receive credit by the concerned government departments. The departments should establish suitable management information systems at district level for this purpose and inform NABARD on a regular basis on the number of SHGs formed and their status and maturity to facilitate their credit linkage with banks. Like other government departments, the Department of Fisheries of Maharashtra should also play a role as self-help promoting institution with a special emphasis on coastal villages, where a sizable part of the population is involved in fisheries and fisheries related activities.

### **3. FINDINGS AND RECOMMENDATIONS OF THE STUDY ON LIVELIHOOD OPPORTUNITIES AND MICROFINANCE SUPPORT FOR WOMEN IN COASTAL FISHING COMMUNITIES IN ORISSA**

#### **3.1 Objectives and method of study**

The study carried out in Orissa had two major objectives. The first objective was to assess the livelihoods of women in coastal fishing communities. This included an assessment of the status and achievements of the self-help group movement among women in fishing villages and their access to microfinance and rural credit facilities. The second objective of the study was the preparation of an action plan for the empowerment of fisherwomen in Orissa, which could be used by the various institutions such as fisheries extension services, NGOs, fisheries training institutes, financial institutions, district rural development agencies (DRDAs) and others, who are playing a role in fisheries and rural development in Orissa.

The information presented in the study report was collected during field visits to all coastal districts of Orissa and through participatory rural appraisals, which were carried out in close cooperation and consultation with the concerned stakeholders.

In order to involve and sensitize the concerned stakeholders, i.e. women self-help groups and their federations, NGOs, the National Bank for Agriculture and Rural Development and various types of financial institutions operating in the coastal districts of Orissa, the Department of Fisheries of Orissa and other concerned government agencies, the study commenced with an inception workshop to solicit the cooperation, views and suggestions of all stakeholders regarding method, approach and focus of the study and to share their experiences. The workshop was attended by 44 stakeholder representatives. The villages and organizations to be covered by the field study and the questionnaires and the PRA approach to be used were discussed thoroughly. This was appreciated by all participants and resulted in their active participation in the study.

After the inception workshop, field visits were made to the six coastal districts of Orissa, i.e. Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri and Ganjam. The study team consisted of Mr M.A. Upare, General Manager, NABARD, and team leader, Mr M.K. Srivastava, Assistant General Manager, NABARD, and Mr Jayant Kumar Samal, Manager, NABARD.

During the field visits to coastal fishing villages, meetings were held with members of fisherwomen SHGs, bank officers, NGOs working with fishing communities, field officers of the departments of fisheries, animal husbandry, agriculture, of the district rural development agencies, of NABARD, members of fishermen and fisherwomen cooperative societies, members of fisherwomen associations and staff of fisheries research and training institutes. The facilities and economic activities carried out by SHGs and fisherwomen cooperatives and associations were observed together with fishing craft and gear, fish farming and processing activities and equipment as well as agricultural activities, housing and rural infrastructure.

Two district level workshops were organized, where the preliminary observations and findings of the study were discussed. The final study report was discussed and finalized at a state-level workshop.

### **3.2 Status of fisheries sector in Orissa**

#### ***Macro-economic, political and geographic context***

Orissa occupies 4.75 percent of India's landmass and accounts for 3.74 percent of the country's population. The state comprises three revenue divisions, 30 districts, 58 subdivisions, 314 blocks and 51 048 administrative villages. As per 2001 census, the population of Orissa is 36.71 million. The percentage of the population classified as members of scheduled casts (SCs) and tribes (STs) is 16.20 and 22.21 percent, respectively. The overall literacy rate is 63.61 percent and the female literacy rate is 50.97 percent, which is below the national averages of 65.38 percent and 54.16 percent, respectively.

While the state is endowed with a wealth of natural resources of groundwater, minerals, fertile soils, fishery resources and a diverse flora and fauna, it is one of the least developed and backward states of India. Indicators and reasons for this state of affairs are, among other things, traditional farming practices with only 2 percent of the crops cultivated being commercial crops; a high incidence of poverty with 47 percent of the population being classified as poor; frequent occurrence of natural calamities, droughts, floods and cyclones; an underdeveloped infrastructure; subsistence level economic activities prevailing in the non-farm sectors and a strong influence of tribal considerations in public affairs.

#### ***The fisheries sector***

The fisheries sector plays a significant role in the economy of Orissa. It accounts for 2.2 percent of the GDP of the state. Eighty percent of the population eats fish, of which 64 percent prefer freshwater fish, 33 percent prefer marine fish and 3 percent prefer brackish water fish. In terms of fish production and productivity, the state lags well behind neighbouring states.

The per capita fish consumption in Orissa of 8.48 kg is below the WHO recommended level of 11 kg. In recent years, however, the sector has generated more interest among various stakeholders. In order to increase production and productivity, the State Government of Orissa has promulgated a number of fishery sector friendly policies, which aim at exploiting the fishery resources of the state in a sustainable manner.

Table 1 below shows the fishery and aquatic resources of the coastal districts in relation to the total resources of the state.

**TABLE 1**  
**Fisheries and aquatic resources of the coastal districts of Orissa**

Type of fishery resources	Total state resources	Resources of coastal districts	Share of coastal districts in state's resources (%)
Marine coastline (km)	480	480	100
Tanks and ponds (ha)	116 280	42 741	37
No. of reservoirs	1 757	593	34
Freshwater area (ha)	175 801	8 250	5
Length of rivers (km)	6 819	2 660	39
Brackish water area (ha)	417 537	417 537	100

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

The fish production of 3 069 tonnes in 2003/04 amounted to only 54 percent of the estimated potential production. Most of the unexploited potential and potential for future production increases lies in the inland and brackish water areas of the state as shown in table 2 below.

**TABLE 2**  
**Level of exploitation of fishery resources in Orissa**

Sub-sector	Estimated fishery resources potential (tonnes)	Present production	Present level of exploitation of resources potential (%)
Inland/freshwater areas	339 700	165 600	49
Brackish water areas	65 900	24 400	37
Marine waters	160 900	116 900	73
<b>Total</b>	<b>566 500</b>	<b>306 900</b>	<b>54</b>

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

### *Marine fisheries*

With a coastline of 480 km along the Bay of Bengal, Orissa accounts for 8 percent of the coastline of India. Orissa's coastline is shared by six coastal districts i.e. Ganjam, Puri, Jagatsinghpur, Kendrapara, Bhadrak and Balasore. As shown in table 3 below, Puri has the longest coastline of all coastal districts of Orissa.

**TABLE 3**  
**Coastline of Orissa's coastal districts**

Name of district	Length of coastline (km)
Balasore	80
Bhadrak	50
Kendrapara	68
Jagatsinghpur	67
Puri	155
Ganjam	60
<b>Total</b>	<b>480</b>

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

The continental shelf of Orissa up to a depth of 200 m covers an area of 23 830 km<sup>2</sup>, which accounts for 4.5 percent of India's continental shelf. Most of Orissa's continental shelf, i.e. 85 percent is located within the 100 m depth range and about two-thirds of it within the 50 m depth range as shown in table 4 and is accessible for small-scale fishing vessels.

**TABLE 4**  
**Continental shelf of Orissa**

Depth zone (m)	Continental shelf area (km <sup>2</sup> )
0–20	6 820
21–50	8 650
51–100	4 810
101–200	3 550
<b>Total</b>	<b>23 830</b>

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

More than two-thirds of all coastal fishing vessels operating along the coast of Orissa including those operating in estuarine waters are non-motorized vessels powered by sails or oars. Of the motorized fishing vessels, more than half are powered by outboard engines as shown in table 5 below. It is interesting to note that compared to almost two decades ago, the number of non-motorized fishing vessels has only slightly increased from 7 156 in 1983 to 7 647 in 2001 while the number of motorized vessels has increased more than fivefold over the same period from 673 to 3 643 vessels.<sup>6</sup>

**TABLE 5**  
**Distribution of coastal fishing vessels in Orissa**

District	Motorized fishing vessels				Non-motorized fishing vessels
	Inboard engine	Outboard engine	FRP beach landing craft	Total	
Balasore	915	0	0	915	638
Bhadrak	422	0	0	422	556
Jagatsinghpur	349	0	354	703	1844
Kendrapara	597	0	0	597	1948
Puri	0	682	85	767	1050
Ganjam	33	206	0	239	1611
<b>Total</b>	<b>2316</b>	<b>888</b>	<b>439</b>	<b>3643</b>	<b>7647</b>
<b>%</b>	<b>20</b>	<b>8</b>	<b>4</b>	<b>32</b>	<b>68</b>

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

The most common fishing gears used in Orissa are various types of gillnets, i.e. driftnets, bottom set gillnets and encircling gillnets followed by shore seines and trawlnets as shown in table 6 below. In addition to the fishing gears shown in the table, traditional gears are used such as hooks and lines, cast nets, traps, stake nets and other traditional fishing gears.

**TABLE 6**  
**Distribution of major marine fishing gears in Orissa**

District/No. and type of fishing gear	Gillnets	Shore/beach seines	Trawlnets	Total
Balasore	6610	650	1160	8420
Bhadrak	1890	253	820	2963
Jagatsinghpur	922	578	1220	2720
Kendrapara	650	57	340	1047
Puri	10780	980	460	12220
Ganjam	4260	2306	0	6566
<b>Total</b>	<b>25112</b>	<b>4824</b>	<b>4000</b>	<b>33936</b>
<b>%</b>	<b>74</b>	<b>14</b>	<b>12</b>	<b>100</b>

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

<sup>6</sup> Kalavathy, M.H. & Tietze, U. 1984. *Artisanal marine fisheries in Orissa: a techno-demographic study*. Bay of Bengal Programme Working Paper 29. Chennai, India.

There are considerable differences between the coastal and aquatic environments of the northern and southern coast of Orissa.<sup>7</sup> The southern coast has a narrow continental shelf, wide and sandy beaches and surf beaten shores. The northern coastline is characterized by a wide continental shelf, river deltas and estuaries. As a result of the different ecosystems, the abundance of fish throughout the year and the species caught also differ as shown in table 7.

**TABLE 7**  
**Seasonal abundance of fish along the coast of Orissa**

Coastal zone	Season	Fish species
Northern coastline	Summer (March–June)	Hilsa, polynemids, sciaenids, catfish, shark, pomfret, clupeids, ribbon fish
	Winter (October–February)	Prawn, clupeids, black pomfret, seer fish, silver belly, Bombay duck, ribbon fish, catfish, sciaenids, perches, mugil
	Rainy season	Hilsa, pomfret, shark, sole
	Peak abundance of fish: August to October and November to February	
Central coastline	Summer (March–June)	Sardine, mackerel, seer fish, pomfret, shark, catfish, eel, mugil
	Winter (October–February)	Rays, shark
	Rainy season	Catfish, seer fish, pomfret, sciaenids
	Peak abundance of fish: August to October and November to February	
Southern coastline	Summer (March–June)	Sardine, mackerel, seer fish, pomfret, shark, catfish, eel, mugil
	Winter (October–February)	Ribbon fish, perch, prawn, sardine, sciaenids, clupeids, mugil, mackerel
	Rainy season	Hilsa, prawn, perch, catfish eel, sciaenids, ribbon fish, pomfret
	Peak abundance of fish: July to September, October to February, March to June	

### ***Freshwater fisheries in coastal districts***

Coastal fishing communities also exploit freshwater resources such as rivers, tanks, ponds and reservoirs. Table 8 below shows the size of these resources both in the coastal districts and in the entire state. It is interesting to note that more than one-third of the freshwater resources contained in tanks, ponds and rivers are located in the coastal districts alone. As already observed above, only half of the state's freshwater resources is presently used for fishery purposes.

**TABLE 8**  
**Freshwater resources in Orissa and the coastal districts**

Freshwater resource	State of Orissa	Coastal districts	Share of coastal districts (%)
Tanks and ponds (ha)	116 280	42 741	37
Reservoirs (ha)	113 600	6 440	6
Rivers (km)	6 819	2 660	39

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

With the objective to make better use of the freshwater resources of the state for fishery purposes, the fish farmers' development agencies (FFDAs) promote fish farming in all coastal districts and provide training and other support. The state government has taken policy initiatives to lease out ponds under the jurisdiction of local government and village councils or gram panchayats to self-help groups. In

<sup>7</sup> Tietze, U. 1985. *Artisanal marine fisherfolk of Orissa*. Cuttack, India. Vidyapuri publishers.

the southernmost district of Ganjam, reservoirs have also been leased to SHGs. The fishing in these reservoirs is done by women, who are members of SHGs.

### ***Brackish water fisheries in coastal districts***

Brackish water fish farmers' development agencies (BFDAs) have been established in all coastal districts of Orissa and promote brackish water fish and prawn farming. Out of the total brackish water area of the state of 417 537 ha, BFDAs have identified 32 587 ha as suitable for prawn culture; 13 074 ha are presently being used for this purpose. There is great scope for involving SHGs in brackish water fish and prawn farming by making use of brackish water resources, which are lying idle.

### ***Fish marketing and processing***

Most fish and other marine products in Orissa are still marketed in fresh form while only a smaller part is sold as frozen, dried or salted product as shown in table 9 below.

**TABLE 9**  
**Marketing and processing of fish and prawns in Orissa**

<b>Catch sold in fresh/processed form</b>	<b>Percent</b>
Fresh fish	84
Frozen fish/prawn products	7
Dried fish products	6
Salted fish products	3
<b>Total</b>	<b>100</b>

Source: Department of Fisheries of Orissa, Fisheries Census of 2001.

### ***Fisheries regulations***

Marine fishing is regulated by the Orissa Maritime Fishing Regulation Act. Registration of trawlers, licensing of fishing vessels as well as the conservation of endangered species of fish and turtles are being regulated by the act. The Orissa Marine Fisheries Regulation Rules, which came into effect in February 1984, make it mandatory for all fishing vessels to be registered against the payment of a registration fee, which is payable only once in the lifetime of a fishing vessel. Registration fees are charged depending on the size of vessels as shown in table 10 below.

**TABLE 10**  
**Registration fees of fishing vessels in Orissa**

<b>Class of fishing vessel</b>	<b>Registration fees (in INR)</b>
Mechanized fishing vessels exceeding 25 gross tonnes in weight or 15 m in length (large-scale mechanized)	1 000
Mechanized fishing vessels with less than 25 gross tonnes in weight or 15 m in length (small-scale mechanized)	500
Traditional, non-motorized fishing boats exceeding 8.5 m in length powered by sails and/or oars, log rafts and canoes	40
Traditional, non-motorized fishing boats under 8.5 m in length powered by sails and/or oars, log rafts and canoes	20

In addition to the registration, every fishing vessel owner fishing in the state's waters must obtain a licence from the Department of Fisheries of Orissa. The licence specifies the fishing port/landing site from which the vessel can be operated. No fishing vessel is allowed to change its base of operation and fishing port without permission of the concerned fisheries officer, under whose jurisdiction the fishing port falls. The fishing licence must be renewed before completion of one year from the date of issue of the fishing licence and on payment of a licence fee before the end of June for the year commencing on 1 July. Licence fees are charged in accordance with the size of a vessel as shown in table 11 below.



**TABLE 11**  
**Licence fees of fishing vessels in Orissa**

<b>Class of fishing vessel</b>	<b>Annual licence fees (in INR)</b>
Mechanized fishing vessels exceeding 25 gross tonnes in weight or 15 m in length (large-scale mechanized)	1 000
Mechanized fishing vessels with less than 25 gross tonnes in weight or 15 m in length (small-scale mechanized)	500
Traditional, non-motorized fishing boats exceeding 8.5 m in length powered by sails and/or oars, log rafts and canoes	75
Traditional, non-motorized fishing boats under 8.5 m in length powered by sails and/or oars, log rafts and canoes	30

In addition to the licence fee, the owner of a mechanized vessel must make a security deposit of INR100. The security deposit is valid for the entire period of operation of the vessel and is returned to the vessel owner when the vessel is not operated any longer. Fishing licences can only be renewed with supporting evidence of the payment of security deposits and previous licence fees.

The Orissa Maritime Fishing Regulation Act also specifies the areas where fishing vessels may operate. Non-motorized traditional fishing craft may operate freely without any restrictions. The coastal waters up to 5 km from the shoreline are exclusively reserved for traditional fishing vessels and mechanized fishing vessels are prohibited from operating in these inshore waters. Mechanized fishing vessels up to 15 m in length and 25 gross tonnes in weight must operate beyond 5 km from the shoreline and mechanized fishing vessels of 25 gross tonnes and above or above 15 m in length must operate beyond 10 km from the shore. Every owner of a registered fishing vessel must furnish monthly reports of his/her fishing operations to the concerned fisheries officer. The reports include information on fishing areas, catch composition, duration of fishing trips and other pertinent information. As far as offshore fishing is concerned, no fishing vessel based in Orissa is allowed to operate beyond 24 nautical miles from the shore.

With the establishment of exclusive fishing areas for traditional fisherfolk and for the small-scale mechanized sector, the fisheries regulations of Orissa aim to protect the traditional small-scale fisheries sector and the small-scale mechanized fisheries sector from competition of the large-scale commercial fisheries sector.

With the purpose to conserve marine turtles, which are classified as endangered species, the Government of Orissa issued a notification of amendments to the marine fishing regulations and subsequent orders, which took effect on 28 May 2004. These new regulations, while helping to conserve marine turtles, changed the previous fishing regulations and restricted the operations of the traditional small-scale fisheries sector and the commercial mechanized fisheries sector in Orissa considerably. The regulations have a negative impact on the livelihoods of the concerned fishermen, women and their families.

The newly introduced regulations prohibit fishing along the entire coast of Orissa by both mechanized and traditional fishing vessels fitted with inboard and outboard engines during the period from 15 April to 31 May 2004 of each year. This period does not coincide with the peak fishing seasons along the northern and central coastline. It coincides, however, with one of the traditional peak fishing seasons along the southern coastline, where it has a more severe economic impact on the fisheries sector.

Fishing is also prohibited during five months from January to May of each year from the high tide line of the central Orissa coast from the Jatadhar river mouth to the Devi river mouth and from the Chilka mouth (Magarmukha) to the Rushikulya river mouth. This period coincides with one of the two traditional peak fishing seasons on the central part of the Orissa coastline. Fishing is further prohibited

throughout the year within a seaward radius of 20 km from the Gahirmatha area of the Bhitarkanika Wild Life Sanctuary. Trawlers are not allowed to fish within 20 km of the entire Orissa shoreline.

### ***Credit flow to fisheries sector***

Commercial banks in Orissa account for 72 percent of all institutional credit to the fisheries sector since 2002. The remaining share is contributed by regional rural banks while cooperative credit institutions play only a minor role because of their weak financial position.

The institutional credit flow to the fisheries sector between 2002 and 2005 is shown in table 12 below.

**TABLE 12**  
**Credit flow to fisheries sector in Orissa (2002-2005) <sup>8</sup>**

<b>Year</b>	<b>Credit disbursement to fisheries sector (in INRmillion)</b>
2002/2003	135.571
2003/2004	121.963
2004/2005	152.585
<b>Total</b>	<b>4 101.190</b>

Of the credit disbursements of financial institutions to the fisheries sector from 2002 to 2005, 14 percent were refinanced by NABARD as shown in table 13 below.

**TABLE 13**  
**Refinance of loans to the fisheries sector in Orissa by NABARD (2002-2005) <sup>9</sup>**

<b>Year</b>	<b>Refinance of credit disbursement for fisheries in Orissa by NABARD (in INR million)</b>
2002/2003	12.800
2003/2004	25.595
2004/2005	18.127
<b>Total</b>	<b>56.522</b>

For 2005/2006, NABARD has prepared a so called potential linked credit plan for the fisheries sector of Orissa. The plan assesses the credit potential and absorption capacity of the fisheries sector as INR million 700.862 against a forecasted actual flow of INR million 354.218 for all coastal districts, which would meet about half of the credit potential. The forecast indicates that the credit flow to the fisheries sector is expected to more than double in 2005/2006 as compared to 2004/2005.

### **3.3 Self-help group movement and microfinance services**

Despite a decline in the incidence of poverty over the years, wide disparities continue to prevail in the poverty ratios of different states in India. In 1983, more than half of the populations of Bihar, Orissa, Tamil Nadu and West Bengal were classified as living below the poverty line. By the year 2000, Tamil Nadu and West Bengal had reduced their poverty ratios by nearly half, while the all India poverty ratio had declined to 27.1 percent. Bihar and Orissa, however, had retained high poverty ratios and 43 and 47 percent, respectively, of their populations lived still below the poverty line.

With the objective to reduce poverty, microfinance programmes were introduced in Orissa as early as 1992. They gained momentum, however, only after 1999, when an exceptionally devastating cyclone had caused severe hardship for the state's economy and particularly the rural poor. Many NGOs took

<sup>8</sup> Based on information obtained from NABARD, Orissa

<sup>9</sup> Based on information obtained from NABARD, Orissa

part in relief and rehabilitation efforts and a large number of SHGs were formed. By 31 November 2004, 91 389 SHGs had been linked to sources of microfinance. Of these, 51 687 SHGs had received loans from regional rural banks, 30 070 SHGs had received loans from commercial banks and 9 632 SHGs had received loans from cooperative banks. Most members of SHGs are women, who did not have access to institutional credit and microfinance in the past.

The progress of the SHG and microfinance movement in Orissa was possible because of various innovative steps taken by NABARD together with other partners, i.e. government agencies, NGOs, banks, individual rural volunteers (IRVs) and vikas volunteer vahinis (VUVs) or farmers' clubs.

Vikas volunteer vahinis (VUVs) or farmers' clubs are informal groups of farmers or fishermen and women, who have previously received loans from banks and are now promoting economic development at the village level. VUVs also play a role as self-help group promoting institutions and assist banks to identify villagers who are in need of financial assistance. They also assist in loan monitoring and recovery. In some cases, VUVs also provide advice to farmers on the management of their micro-enterprises and economic activities.

In Orissa, altogether 410 VUVs have been formed so far in 164 blocks of the state with the help of commercial banks, regional rural banks and cooperative banks. NGOs are also being encouraged to form VUVs in close coordination with banks. NABARD provides grant assistance to banks and NGOs for the promotion of VUVs. So far, five NGOs have been assisted by NABARD in Orissa for this purpose. NABARD also encourages VUVs to propagate the concept of SHGs and assist in the establishment of SHGs. NABARD provides training for capacity building of farmers' club members and also provides incentives to the clubs for formation of SHGs. So far 167 SHGs have been formed in Orissa with support of 23 VUVs. As far as the coastal districts are concerned, 52 SHGs have been formed with support of two farmers' clubs in Ganjam district.

A new initiative of associating so called individual rural volunteers (IRVs) has been launched in two districts of the state, i.e. Malkangiri and Nabarangpur on a pilot basis. Fifty socially committed rural volunteers (25 in each district) will be promoting 500 SHGs. The IRVs will be identified by the participating bank, i.e. Koraput Panchabati Gramya Bank through its 20 branches. NABARD has sanctioned INR690 000 to the bank in support of the IRV programme. Similar assistance is provided to State Bank of India for promoting 250 SHGs in a district, where no NGOs or VUVs are present.

The SHG and microfinance movement in Orissa and elsewhere in India also receives support from the Swarn Jayanti Gramin Swarajgar Yojana (SJGSY) programme. This programme of the Government of India started on 1 January 1999 by merging six previously implemented poverty alleviation programmes. The SJGSY is being implemented by the district rural development agencies (DRDAs). Within the context of the programme, which involves the disbursement of subsidies by DRDAs to rural poor for the generation of self-employment, NABARD is propagating the SHG concept. It is proposed to link the subsidies, of which three-fourth are born by the central government and one-fourth by the state government, to bank loans, which are to be provided to people, who are below the poverty line and who are members of SHGs.

Government agencies are to assist in the establishment of SHGs in close coordination with banks and NGOs. To avoid misuse, subsidies are only being disbursed after the loan received by the concerned SHG has been repaid in full. The maximum amount of subsidy which a SHG can receive is INR125 000. Among the income generating activities identified by the Government of Orissa which can be supported by this programme, fisheries is one of the priority areas. Orders have been issued to local governments to give priority to SHGs formed by women, who are below the poverty line, when leasing out village ponds for the purpose of fish farming. The ponds are to be leased out for a period of five years.

The self-help group movement among women in Orissa also receives support from Mission Shakti, launched by the Government of Orissa on the International Women's Day in 2001. Mission Shakti

aims to strengthen the existing self-help groups and to promote the formation of new self-help groups of poor women. It further promotes the formation of block, district and state level federations of SHGs. Mission Shakti also provides capacity building support by conducting training programmes and by other means.

The ultimate goal of the mission is to develop a client managed, client controlled and client owned microfinance federation. The implementation and coordination of the programme of Mission Shakti is overseen by a high level steering committee headed by the Chief Minister of Orissa as well as by district and block level committees under the chairmanship of district and the block development officers.

NGOs also play an important role as SHPIs. NABARD has supported a number of NGOs and provided grants for this purpose. In Orissa, 83 NGOs have been provided with grant support of INR million 125.16 for forming 8 020 SHGs and linking these SHGs with banks for microfinance assistance. There were 5 438 SHGs formed by NGOs that have already collected and used their own savings and 3 082 have received loans from financial institutions. Of these, 437 SHGs are operating in the coastal districts of Orissa, i.e. Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri and Ganjam.

The number of NGOs working with women in fishing communities is still small but growing. In the absence of an effective monitoring and information system, the exact number of fisherwomen SHGs cannot be ascertained but it is estimated that 2 663 SHGs have been formed in villages, where inland or marine fishing is one of the principal occupations.

### ***Initiatives of NGOs and research institutions***

There are a number of NGOs and research institutes, which provide support to fishing communities in Orissa. They are briefly described below.

- **Lok Sahayak Samiti (LSS)**

The NGO Lok Sahayak Samiti (LSS) was formed in 1992 by social activists for the purpose of helping the rural poor to improve their livelihoods. The office of the NGO is located at the village Nikhira Gobindpur in Puri district. LSS has formed more than 100 SHGs in various villages of Puri district, which consist mainly of rural women. The SHGs have saved more than INR 1 500 000 and also received loans from Puri Gramya Bank in support of their livelihood activities. The livelihood activities focus on the production of shellcraft items, which are mainly sold to tourists and pilgrims visiting the town of Puri. As a centre of worship for Hindus, Puri attracts a large number of visitors throughout the year. The shellcraft items are used as gifts, souvenirs and for the interior decoration of private homes. Raw materials for making shellcraft items can easily be found and collected on the extensive beaches in and around Puri.

LSS organizes training programmes for rural women on basic skills of making shellcraft items, on innovative designs as well as on entrepreneurship and self-employment. Women, who have been trained, become themselves trainers and provide training to other women. The NGO also supports shellcraft making by supplying shells and other raw materials to members of SHGs, whose villages are not located on the coast, and helps to find new markets for shellcraft products through promotional activities and sales in other cities, public places, hotels and at festivals. In addition to shellcraft making, members of the SHGs supported by LSS are engaged in the sale of fish, stone carving, poultry, cultivation and processing of coconuts and other activities. Through sales of the products made by members of the SHGs supported by LSS, an income of INR 1 157 363 was generated in 2003/2004.

- **Peoples Employment and Need Based Community Development Organization (PENCODE)**

The organization, which is registered under the Societies Registration Act, started in 1989 as Pentakota Community Development Project. The project was supported by a Cuttack based organization called Amar Jyoti India and World Vision of India based in Chennai. The project's

objective was to improve the livelihoods of the Telugu speaking fishermen and women living for decades on government owned land in the settlement of Pentakota on the seashore of the town of Puri.

Since its beginning, PENCODE has expanded its operations both geographically and otherwise to improve the social, cultural, health, educational, moral and economic conditions of poor coastal fishing communities and of scheduled caste and scheduled tribe communities of urban and rural coastal and tribal areas in Orissa. As of 31 March 2004, PENCODE had formed 81 SHGs with altogether 1 211 members. The SHGs mobilized savings of INR528 242, which were used to provide loans to 580 SHG members. PENCODE also helped SHGs to obtain loans and assistance from banks and from government and non-governmental organizations.

PENCODE has played a vital role in motivating fisherwomen to organize themselves into four cooperative societies. Three of these cooperative societies are located in the village of Pentakota and one in the village of Chakrathirtha Nuasahi. The societies are registered as Kusturba Gandhi Primary Marine Women Cooperative Society, Gangotri Primary Marine Women Cooperative Society, Santhi Primary Marine Women Cooperative Society and Chakrthirtha Fisherwomen Marketing Cooperative Society. The cooperative societies provide entrepreneurship training to their members. The training is supported over a period of three years by the Support to Training and Employment Programme (STEP) of the Department of Women and Child Development of the Government of India and the Department of Fisheries of the Government of Orissa.

PENCODE also organizes training for members, secretaries and presidents of SHGs on leadership and group dynamics; basic accounting and book keeping; production and sale of handicraft and shellcraft items and marine food processing such as fish drying, making of fish and prawn pickles and processing of shark liver oil.

- Samudram

Samudram is a federation of fisherwomen SHGs in Orissa. The federation represents 247 SHGs with altogether 3 080 members, who reside in four coastal districts, i.e. Ganjam, Puri, Bhadrak and Balasore. Most of the SHGs are concentrated in the southern part of Orissa in the districts of Ganjam (84 SHGs) and Puri (63 SHGs). Samudram is registered under the Cooperative Society Act of 1861. The federation is supported by an NGO called “United Artists Association” (UAA) and by the Orissa Traditional Fish Workers Union.

The federation has a three-tier structure. In villages with a minimum of 2 and a maximum of 18 SHGs, a village level federation called Nari Shakti Sangh (NSS) is formed. This body consists of 7 to 11 members, who elect their office bearers, i.e. president, secretary and treasurer. At the district level, a federation called Zilla Mahila Machimar Sangh (ZMMS) is formed. Each NSS is represented at the district level federation by three representatives. The main functions of district level federations are to provide training support to SHGs and to assist them in the sale of their products. The NSS also plays a role with regard to health, educational, advocacy and community development matters.

Samudram as the state level federation is governed by a board of 18 directors; 15 directors represent the district level federations. The board has three special invitee members, who represent the UAA and the Orissa Traditional Fish Workers Union.

As far as microfinance and credit is concerned the SHGs belonging to Samudram have not been linked with banks for the purpose of obtaining loans in support of the income generating activities carried out by their members. The credit programme, which is operated by Samudram, uses funds provided by an international NGO called Action Aid. INR2 100 000 channeled through UAA have been provided to SHGs for making loans augmented by INR700 000 from Samudram’s own resources. Each SHG pays INR30 per annum to their NSS. SHG members are charged an annual interest of 18 percent on the loans they take. Of the loan interest, SHGs keep 8 percent towards their administrative expenses while 10 percent is used for further lending.

- M.S. Swaminathan Research Foundation

The M.S. Swaminathan Research Foundation based in Chennai supports a bio-village demonstration project in the coastal district of Kendrapara. The project demonstrates how the natural resources of the village can be utilized in a sustainable and integrated way for the benefit of all villagers. It involves fish farming, poultry, animal husbandry, horticulture, the growing of vegetables and also addresses health and education issues. The project also helps villagers to improve the village and local infrastructure and to improve their access to services including banking and health services as well as government services.

The strategy adopted by the project involves raising the awareness of villagers and encouraging their participation and involvement, among other things, through the formation of self-help groups. At the time the study was conducted, 32 SHGs had been formed in Kendrapara and the surrounding villages. Of these groups, 26 consisted exclusively of women with a total membership of 406 and 5 exclusively of men with a total membership of 61.

The SHGs supported by the M.S. Swaminathan Research Foundation also provide credit to their members for various income generating activities. In 2004, INR427 000 worth of credit was provided for the working capital requirements of growing and selling vegetables and flowers, agriculture, dairy, poultry, fish farming, small groceries, educational expenses as well as, in a few cases, for the purchase of equipment such as pumps, power tillers and auto rickshaws.

The project has demonstrated that poor women and men organized in SHGs can engage successfully in a variety of income generating activities and also manage small enterprises as well as utilize and repay loans.

- The Gram Uthan CARE-CASHE project

Gram Uthan is a non-governmental organization based in the coastal district of Kendrapara. Its objectives are to alleviate poverty and to improve the socio-economic status of women including women in fishing communities through microfinance. The Orissa branch of the international non-governmental organization CARE through its CASHE microfinance project has been supporting Gram Uthan in its efforts.

The target group of Gram Uthan includes about 5 000 fisherfolk households with an approximate population size of 30 000, most of which live in the villages Talachua, Gupti and Iswarpur of Rajnagar block. The majority of the older generation living in these villages came originally as immigrants and refugees from Bangladesh, when the country separated from India. Unlike most of the Telugu speaking fisherfolk living in Puri for decades, the former immigrants are now registered as voters and hold titles to the land on which they live. Gram Uthan also works with the villages of Koilipur, Bharigoda, Tarasha and Kalasabani in Rajkanika block and fishing communities, which practice both marine and inland fishing.

Like other NGOs, Gram Uthan started its interaction with fishing communities when it implemented relief and rehabilitation programmes after the devastating cyclone of 1999 and, with financial support from CARE, provided nets and boats to fishing households, which had lost their means of production during the cyclone. As integral part of the relief and rehabilitation efforts, the NGO promoted the formation of a fishermen federation known as Netaji Mastyajivi Mahasangha, which actively participated in the implementation of the rehabilitation programme. With the objective to reduce the influence of middlemen and fish traders and to realize a better price, the federation also become involved in collection and marketing of fish and in implementing a food for work programme.

Later the federation started to provide microfinance services to its members and encouraged them to organize themselves in SHGs. Women were also encouraged to form SHGs. Nearly 100 women SHGs were formed, and their members were trained and provided with credit support. Loan amounts range between INR5 000 to 10 000 and are provided to start income generating activities like fresh and dried fish vending, poultry, raising ducks and fish farming.

- **Kishore Club**

Kishore Club is a non-profit voluntary organization dedicated to rural development. It was established in 1985 and registered in 1989. Its area of operation is the coastal district of Bhadrak with a particular focus on Chandbali Block. The club is involved in the improvement of health, sanitation and education of women as well as in the promotion of income generating and livelihood activities. Kishore Club has formed 316 SHGs located in 22 villages. Nine SHGs have been provided with financial support under the SGSY programme for starting income generating activities including fish farming.

- **National Resource Centre for Women in Agriculture (NRCWA)**

The National Resource Centre for Women in Agriculture was established in 1996 and is located at Bhubaneswar. The mandate of the NRCWA is to identify and test farming technologies, programmes and policies, which pay adequate attention to gender aspects and the role of women in agriculture, to promote gender mainstreaming in research and agricultural extension work, to contribute to the empowerment of women in the agricultural sector and to enable scientists, planners and policy makers to respond to the needs of women in agriculture.

The centre has five sections, i.e. agronomy, agricultural extension, horticulture, home science and livestock production and management. The institute functions under the Indian Council of Agriculture Research (ICAR) of the Government of India. The NRCWA also provides support and training to women SHGs in aquaculture development, paddy parboiling, growing of vegetables and flowers besides helping SHGs in using wasteland for agriculture and fish farming.

- **Central Institute of Freshwater Aquaculture (CIFA)**

The Central Institute of Freshwater Aquaculture is located in Kausalya Ganga close to Bhubaneswar. It is involved in research, extension, education and training on various aspects of freshwater aquaculture. Over the years, the CIFE has made important contributions to freshwater aquaculture development in Orissa and successfully promoted small-scale fish farmer friendly technologies and practices such as small-scale composite fish farming.

### **3.4 Assessment of livelihood opportunities for women in coastal fishing communities**

As part of the study carried out in Orissa, participatory rural appraisals (PRAs) were carried out in the villages visited with the objectives to assess the status of SHGs and their livelihood and microfinance activities and to identify opportunities for strengthening the groups and improving the livelihoods of their members. The findings of the appraisals and observations in the villages are summarized below.

As pointed out above, the involvement of NGOs with coastal fishing communities increased through their involvement in the relief and rehabilitation programmes after the devastating cyclone of 1999, which particularly affected the coastal areas of Orissa. While NGOs work with fisherwomen in many areas of southern Orissa in the districts of Ganjam and Puri, their involvement in the central and northern districts is still limited and needs to be expanded.

The marine wing of the Department of Fisheries of Orissa is making efforts to form and revive women and fishermen cooperatives in the context of the STEP programme of the Government of Orissa. It has been observed that many of the existing and newly formed cooperatives do not function properly. In the case of the women cooperative societies in Berhampur and Attarbarki, it was observed that the management of these societies was in the hands of the few male members while the female members of the societies did not fully understand the functioning of the societies, particularly their functioning regarding financial matters. There is a need for more efforts in the field of capacity building and training.

It was observed that most of the women SHGs, which are engaged in freshwater fish farming, are leasing village tanks and are culturing fish as a joint activity under the Swarna Jayanti Gram

Swarojgar Yojana programme (SGSY) of the Government of India. Most of these groups were formed on the initiative of government agencies in the context of Mission Shakti of the Government of Orissa. Some of the groups which are engaged in fish culture are also cultivating vegetables, shrubs and trees next to the village tanks, where fish is raised.

Prior to joining SHGs, only few of the women were engaged in income generating activities and almost all group members were borrowing money from relatives, friends and moneylenders prior to joining the groups.

As far as the microfinance activities of SHGs are concerned it was observed that these are generally conducted in a satisfactory manner, however, with some exceptions. In most of the groups visited, the amounts involved in the internal lending activities of the groups vary from INR200 to INR2 000. These amounts are considered too small by most women in fishing communities, who are members of SHGs. Most women prefer loans between INR5 000 and 10 000 to meet their working capital requirements. It was also observed that in some groups, loans had been taken twice and thrice by the president and secretary of the group while ordinary members had to wait for their turn.

Almost all SHGs have accounts with local banks. The rate of interest on internal lending varies from 3 to 5 percent per month. The internal savings are deposited in savings accounts maintained with local banks. Only in few cases are cash balances kept by SHGs for emergencies and not deposited in bank accounts.

As far as the relationship of SHGs with banks is concerned, it was observed that SHGs are being burdened with the cost of loan interest. The entire amount, which is being deposited by them in a bank, is being credited to their savings account, where the interest paid by the bank is much below the interest charged by the bank for the outstanding loan taken by the SHG, rather than to their loan account. It is recommended that this practice is changed.

Banks in Orissa have so far not provided a second loan to SHGs even though there is a need for a continued access of SHGs to institutional credit. Once a SHG has fully repaid a loan taken from a bank, there is no reason why the bank should not provide a second loan. Banks are further reluctant to lend to SHGs, which are not covered under the Swarna Jayanti Gram Swarajgar Yojana programme (SGSY) of the Government of India, where the loans provided by banks are augmented by subsidies provided by government agencies.

It was also observed that the training opportunities for SHG members are not yet adequate. Training on fish culture is only provided to a maximum number of three women per SHG while the actual demand for training is much greater. Training and capacity building of SHG members and other stakeholders is urgently required at a larger scale and greater pace.

Most members of SHGs, especially fisherwomen, lack education, access to health facilities and services, adequate housing and other infrastructural facilities. Almost all members of the SHGs visited do not have land and many reside in makeshift huts near the seashore on Government land. It was further observed that the income generating activities carried out by members of SHGs are hampered by the lack of insurance cover for livestock and against natural calamities.

As far as livelihood security is concerned, members of women and fishermen SHGs, particularly on the central and northern coast of Orissa, highlighted that the recently introduced fishing restrictions related to the conservation of sea turtles and to a missile testing range off the coast of Balasore district, have affected their livelihoods very negatively. They pointed out that when they cannot go fishing during extended parts of the year, they lose their principal source of income and food.

Based on participatory rural appraisals and on discussions with fisherwomen, fishermen and stakeholders in fisheries research and training institutes, financial institutions and concerned government agencies, fisheries related and non-fisheries micro-enterprises and income generating



activities were identified, which offer additional livelihood opportunities for fisherwomen in Orissa. These include traditional as well as innovative and emerging enterprises and activities and take into account local skills, markets and the potential for a sustainable utilization of natural resources in an eco-friendly manner. The cost and earnings of some of the micro-enterprises and the inputs and outputs are shown in Annex VII to this report. The study carried out in Orissa cooperated with the study carried out in Maharashtra in standardizing the proposed fisheries related micro-enterprises, which can be undertaken in both states. This explains why the standard economics of these enterprises shown in Annex VII are identical. The standard economics are models, which should be verified and adopted to the particular locality and circumstances, where the particular enterprise will be undertaken. Some of these models are based on earlier work undertaken by NABARD.

### ***Small-scale fish and integrated fish and prawn farming***

In recent years, this activity has become more important for providing livelihoods for women in coastal fishing communities in Orissa. As the marine fish production in inshore waters has reached its potential considering the fishery resources, which can be exploited by the present fishing fleet, the State Government of Orissa is emphasizing the development of presently not utilized freshwater resources in the form of village ponds, reservoirs and other waterbodies to produce fish for domestic consumption. The State Government of Orissa has not only promulgated sector friendly policies but also streamlined the procedures for implementation of these policies. As a result, waterbodies under the jurisdiction of local governments such as village ponds and tanks are being leased out for a period of three to five years to women SHGs.

With the active coordination among the concerned government departments at the field level, 1 472 waterbodies have already been leased out to various women SHGs for the purpose of fish farming. Arrangements have been made for providing training and supply of production inputs like quality seed. The fisheries extension service of the Department of Fisheries of Orissa provides extension support in areas such as pond preparation, management of water quality, monitoring of health, control of fish diseases and in some cases marketing of fish.

Fish farming is a livelihood activity which women can pursue close to their home as a part-time activity and which can be combined with other chores. While fish farming is presently generating income for poor women, it needs to be further developed in order to realize maximum benefits. This concerns the size and location of ponds to be used, the type of species to be cultured, the feed to be used and other operational aspects. There is also a need to link the SHGs, which are involved in fish farming, to financial institutions so that they can obtain loans to finance the necessary capital and working capital investments. The most suitable and profitable types of fish and prawn farming, which can be undertaken by fisherwomen SHGs in Orissa <sup>10</sup> under the present circumstances are mentioned below.

Composite fish farming in existing tanks is most suitably and profitably undertaken by SHGs in tanks with a water area of 0.4 ha and a culture period of 11 months. The capital cost involved is INR32 670 and the cost of operation is INR15 089. The expected annual income in the first year of operation is INR28 000 and INR35 000 from the second year onwards. Capital and working capital expenses can be financed by a loan with a repayment period of five years and a grace period of one year.

As fish farming is expanding in Orissa, the demand for fish seed is expected to increase to more than 1 billion seed per annum as compared to the present production of 0.67 billion. The private sector will have a significant role to play in meeting the increase in demand. With proper training and marketing arrangements, SHGs can engage in fish seed rearing in a profitable way. A few SHGs have already started the activity in the districts of Kendrapara and Bhadrak and there is great scope for expanding this activity to other coastal districts and SHGs.

---

<sup>10</sup> Most of the fish and prawn farming activities are also suitable for women SHGs in Maharashtra and other coastal states with a similar coastal and aquatic environment.

Fish seed rearing in seasonal tanks is most suitably and profitably undertaken by SHGs in tanks with a water area of 0.2 ha. The culture period is four months and three culture cycles can be completed per year. The capital cost is INR59 049 and the cost of operation is INR12 863. The expected annual income from this activity is INR 63 000.

In Orissa and elsewhere in India and abroad, there is an increasing demand for ornamental fish in both domestic and export markets. With proper training and initial marketing support, coastal women can gainfully engage in the small-scale breeding of ornamental fish.

A small-scale breeding unit for ornamental fish requires the use of four breeding tanks, two rearing tanks, two broodstock tanks, eight larvae rearing tanks and one bore well. The capital cost involved is INR53 800 and the working capital INR24 600. The expected annual revenue is INR76 800.

Considering the involvement of women in various agricultural work in their day-to-day life, women can integrate these activities with fish farming. Integrated small-scale fish farming often yields a higher and more regular income and spreads the risk of farming activities more evenly as demonstrated by the bio-village demonstration project of the M.S. Swaminathan Research Foundation with support from NABARD in the coastal district of Kendrapara. Under the concept of integrated farming, available space around the waterbody is utilised for production of seasonal vegetables and for fodder cultivation. As well as generating additional income, integrated farming also increases the nutritional standard of the households as part of the produce is consumed by the producer. Fish farming can be integrated with the growing of vegetables, flowers, shrubs and trees as well as with poultry and the raising of goats. The choice of the type of integration to adopt depends on the suitability of the site, where the pond is located, and on social acceptance. Integration of fish culture with horticulture and growing of flowers and vegetable is widely acceptable in Orissa. In the case where village ponds are leased for fish culture, integration of fish farming with other activities is more difficult as the dykes of the ponds may be used by other villagers for various purposes.

Where SHGs fully control the use of fish ponds, integrated fish and poultry farming is a very suitable and profitable undertaking. For a water area of 0.4 ha and a culture period of 11 months, the capital cost involved is INR62 728 and the cost of operation is INR27 388. The expected annual income in the first year of operation is INR40 000 and INR47 000 from the second year onwards.

Another, even more profitable example of integrated fish farming is composite fish and freshwater prawn farming in newly excavated tanks. Prawns are a highly priced commodity both in local and international markets. The Marine Products Export Development Authority of India (MPEDA) is planning to develop an additional 11 500 hectares for freshwater prawn farming both poly- and monoculture by the end of 2010. Much of the production is expected to come from the small-scale sector. In Orissa, the coastal districts of Ganjam and Balasore have taken the lead in freshwater prawn farming.

In the case of SHGs, which are interested to engage in the farming of freshwater prawns, there is a need for initial marketing support so that the SHGs can realize a remunerative price for their freshwater prawns. Small-scale composite fish and freshwater prawn farming is most gainfully done in newly excavated tanks with a water area of 0.4 ha. The culture period is 11 months. The capital cost involved is INR105 338 and the cost of operation is INR25 161. The expected annual income in the first year of operation is INR54 250 and INR66 500 from the second year onwards.

There is also a strong export market demand for brackish water prawns. Brackish water prawn farming in Orissa is done on a commercial basis on private land in all six coastal districts. Further progress of the sector in the state depends upon the utilization of suitable government land. Given preferential allotment of suitable land and existing but presently not utilized brackish water ponds, which were constructed under a previous World Bank funded project in the district of Kendrapara, women SHGs can take up farming of brackish water prawns for income generation.

Small-scale brackish water prawn farming is most suitably done in a water area of 0.4 ha and a land area of 0.6 ha. The culture period is 120 days. The capital cost involved is INR29 053 and the cost of operation is INR50 189. The expected income after a 120 day culture period is INR75 000.

### ***Small-scale fish processing***

The production and selling of dried fish is a traditional activity of women in Orissa. In recent years, the Government of Orissa has provided training to fisherwomen under its STEP programme to improve the quality and hygienic condition of dried fish products. As there is a seasonal abundance of reasonably priced fish in all coastal districts of Orissa and great demand for dried fish products not only in Orissa but also in the cities of neighbouring states, which command higher prices than local markets, there is scope for SHGs in Orissa and their federations, to transform the activity of fish drying to a micro-enterprise by operating small-scale fish drying plants, which can be operated for 150 days per year. The capital cost involved is INR411 400 and the cost of operation is INR2 532 550. The expected annual income in the first year of operation is INR2 193 750 and the expected income from the second year of operation onwards is INR2 925 000.

On a selective basis, production of value-added products like fish pickles, fish cutlets, fish wafers, fish balls, fish fingers and similar ready-to-eat products can be taken up by coastal women, particularly in coastal areas near towns like Puri, Gopalpur, Berhampur and Balasore. There is a need for training and initial marketing to be provided by NGOs, fisheries colleges and the fisheries department.

### ***Coastal forestry and horticulture***

Coastal forestry and the planting of casuarina trees and mangroves can play a significant role in safeguarding the coast and coastal villages from natural calamities and disasters such as cyclones and tsunamis. There are opportunities for women SHGs to plant casuarinas on government land along the coastline. With an estimated average investment of INR27 900, the planting of casuarinas on 1 ha of wasteland may help a SHG to generate an income of INR102 500 after six years through the sale of wood for fuel and wooden poles for house construction and other purposes.

SHGs of coastal women can also engage in cashew and coconut plantation on government land. As in the case of coastal forestry, there is a need for long-term lease of suitable land and adequate supporting credit facilities. Many coastal women are already working as labourers in privately owned plantations. Given an opportunity, these women and their SHGs can manage their own plantations and thereby generate more income as they are presently earning as wage labourers.

In the case of growing cashew nuts on 1 acre of land, the total cost incurred over a five year period is INR12 000 and the expected total income to be generated is INR19 600.

In the case of cultivation of coconuts on 1 acre of land, the total cost incurred over a five year period is INR13 321 and the expected total income to be generated is INR21 900.

### ***Non-farm sector income generating activities***

There are also a number of income generating livelihood activities outside fisheries, agriculture and forestry, which can be undertaken by SHGs in the coastal districts of Orissa. These include the production of shellcraft. With an initial investment of INR2 000, a skilled woman can generate a net income of INR1 000 per month.

Women in coastal areas can also take up weaving of nets as a supplementary activity. On a contractual basis, women of a SHG in Balaramgadi, Balasore district, earn an income of INR30 to 50 per kilogram of codends of trawlnets woven. Income can also be generated by the production of palm leaf based utility items like hand fans, mats and small containers and by the production of bamboo based utility items like baskets and tools, which are used in the handling of agricultural products. Retail activities also offer opportunities for generating additional income. SHGs in Puri have started to supply diesel and kerosene to fishermen.

### 3.5 Proceedings and recommendations of state-level workshop

The state-level workshop, where the findings of the study in Orissa were presented and discussed by stakeholders, was attended by 27 participants representing fisherwomen SHGs and associations, NGOs, the Fisheries Department of Orissa, financial institutions and NABARD. The list of participants is shown in Annex I. The programme of the workshop is shown in Annex II.

The workshop began with a presentation on FAO's policies and strategies for small-scale fisheries development and the role of credit and microfinance. This was followed by a presentation on the recommendations of the 26<sup>th</sup> Session of FAO's Committee on Fisheries regarding the contribution of small-scale fisheries to poverty alleviation and rural development.

The findings and recommendations of the study on livelihood assessment and livelihood programmes for women in coastal fishing communities in Orissa were presented by Mr M.A. Upare, General Manager, NABARD, and leader of the NABCONS study team. The presenter highlighted recent changes, which had negative effects on the small-fisheries sector in Orissa and on the livelihoods of small-scale fisherfolk. These changes include increased competition from mechanized fishing boats and declining catch rates as well as turtle conservation measures, which had resulted in the ban of fishing operations in and adjacent to the mouth of major rivers and estuaries along the entire coast of the state. At the time the study was carried out, no programmes were in place to assist or compensate small-scale fisherfolk households for the lost income due to newly imposed fishing bans.

On the positive side, the speaker highlighted the recent advancement of the self-help group movement among fisherwomen in Orissa. The Government of Orissa had acknowledged the success of the self-help group movement by giving priority to fisherfolk and women SHGs when leasing out village and government owned ponds for fish culture.

The speaker then presented the findings and recommendations of the study, which were translated into Oriya and Telugu to facilitate the participation of members of the fishing community in the discussion. The recommendations included an action plan for the empowerment of fisherwomen in Orissa, which had three main objectives, i.e. the empowerment of women in fishing communities through the expansion of the self-help group movement to all coastal villages, the utilization of natural resources including aquatic and fisheries resources as well as other natural resources by adopting eco-friendly practices and to promote and facilitate entrepreneurship in a sustainable manner. The following areas are covered by the action plan:

- expansion of the self-help group movement among women in fishing communities in all coastal districts of Orissa;
- sensitizing fisherwomen and expanding partnerships with self-help promoting institutions (SHPIs);
- capacity building measures in cooperation with NABARD and Mission Shakti;
- graduating from microfinance clients to micro-entrepreneurs;
- credit linkages for fish drying micro-enterprises;
- diversification of aquaculture to integrated fish farming;
- streamlining of leasing policies for village ponds;
- policy initiatives for leasing brackish water areas to SHGs;
- review of marine fishing regulations and policies with regard to their impact on livelihoods of fisherfolk and women in coastal Orissa;
- exposure visits of SHGs to familiarize with innovative livelihood technologies;
- improving rural infrastructure;
- formulation of a technical cooperation project.

During the discussion, which followed the presentation of the action plan, members of women SHGs stressed that by becoming members of SHGs, they had gained confidence to speak in public meetings and to make their voice heard in matters which concerned them. Other representatives of women self-

help groups mentioned that they needed capital for acquiring refrigerators and cold storages, if their SHGs were to produce and sell value-added fish products. It was also mentioned that while getting access to institutional credit and microfinance would be helpful, they needed marketing and infrastructure support if they were to make the best use of financial support.

As far as the leasing of ponds for fish farming is concerned, participants suggested that if integrated fish farming was to be undertaken, ponds should be leased out for longer periods than five years so that they could fully recover investments needed for integrating fish farming with vegetable cultivation, horticulture and poultry.

Representatives of a federation of fisherwomen SHGs mentioned that traditional middlemen and traders opposed the formation of self-help groups as they perceived them as threats to their influence on and business dealings with the fishing community.

NGO representatives mentioned that because of the restrictions in marine fisheries in Orissa, the emphasis should now be on inland fisheries. SHGs should be trained on how to use small streams and small ponds with seasonal water supply for fish farming and fishing and priority should be given to lease out these water bodies to SHGs. Representatives of an NGO working with marine fishing communities highlighted that the lack of rural infrastructure posed a severe problem for the livelihoods of fisherfolk. Coastal fisherfolk of Telugu origin living for generations on government land are threatened from time to time with eviction from their homes. These fisherfolk should be given the title to the land on which they live. This would improve their livelihood security substantially.

Representatives from financial institutions observed that training of SHG members in small-scale business management was very important and that the long-term success of SHGs depended on the support of NGOs and government agencies. Another crucial element in the success of SHGs involved in fishery micro-enterprises was seen in their access and use of marketing information so that they target appropriate markets, adapt their products to these markets and get remunerative prices for their products.

With reference to the recommendations of the study and the proposed action plan regarding the review of fisheries regulations and policies in Orissa and their impact on the livelihoods of small-scale fisherfolk, it was mentioned that a review of fisheries policies and regulations in Orissa had just begun and that a new policy would be formulated as soon as the review had been completed.

The action plan was adopted as presented. It is shown in Annex III.

## **4. FINDINGS AND RECOMMENDATIONS OF THE STUDY ON ACCESS OF WOMEN IN COASTAL MAHARASHTRA TO MARKETS, CREDIT AND LIVELIHOOD OPPORTUNITIES**

### **4.1 Objectives and method of study**

The study carried out in Maharashtra had three objectives, i.e. to assess the livelihoods of women in coastal fishing communities and their access to credit, to analyse the role of small-scale fisherfolk in fish marketing along the coast and to identify opportunities for the improvement of livelihoods of poor fisherwomen and fishermen in coastal Maharashtra.

The study covered all five coastal districts of the state. In each district, two villages were selected for field studies as follows:

- Greater Mumbai district – Mahim and Marve village;
- Thane district – Dhakati Dahanu and Murbe village;
- Raigad district - Agrav and Shrivardhan village;

- Ratnagiri district – Paj pandhari and Varavada village;
- Sindhudurg district – Anandwadi and Nivati village.

Fish landing centres were also visited by the study team, i.e. Mahim, Satpati, Revadanda, Harne, Mirkarwada and Deogad.

The study began with desk research at the Taraporevala Marine Biological Research Station (TMBRS), Mumbai, the review of secondary literature and the preparation of survey methods and questionnaires in consultation with economists and statisticians from the Regional Research Station, Karjat, and from the College of Fisheries, Ratnagiri, Maharashtra.

In consultation with officials of the Maharashtra Department of Fisheries, the selection of fishing villages and landing centres to be visited by the study team was planned. For first hand information on women self-help groups in fishing villages and SHG-bank linkages, representatives and staff of regional rural banks, district central cooperative banks and district rural development agencies were contacted.

Field visits were made to selected fishing villages for conducting participatory rural appraisals. The data collection techniques used were primarily mapping and semi-structured interviews of stakeholders. Rapid market assessments were carried out at the marine fish landing centres through semi-structured interviews and mapping exercises by stakeholders, i.e. fisherwomen, fishermen, fish vendors, commission agents, wholesalers and others. Visits were undertaken and meetings were held with women self-help groups and cooperative societies. The final study report was presented and finalized at a state level workshop.

## 4.2 Coastal fisheries development scenario in Maharashtra

In order to understand the livelihoods of women in coastal fishing communities and their access to markets and credit, an overview is given of the coastal fisheries development scenario of Maharashtra. This includes an overview of fishery resources potential and production, fishing regulations and leasing policies and an overview of fisheries development schemes and agencies.

### *Fishery resources potential and production*

Maharashtra ranks fifth in marine fish production in India. The length of the coastline of the state is 720 km and the continental shelf area comprises 112 000 km<sup>2</sup>, out of which about half, i.e. 55 529 km<sup>2</sup> is located within the depth zone of 40 fathoms. The state has 320 000 ha of inland waters and 18 600 ha of brackish water areas, of which 10 000 ha are owned by the government, as shown in table 14 below.

**TABLE 14**  
**Marine and inland waters of Maharashtra**

Potential fishery resources	Area
Territorial waters	132 000 km <sup>2</sup>
Continental shelf area	112 000 km <sup>2</sup>
Inland waters	320 000 ha
Brackish water area	18 600 ha

Source: Economic Survey of Maharashtra, 2003/04.

The coastline of Maharashtra also referred to as the Konkan belt or region, is bordered by the Arabian Sea in the west and by the Western Ghats, a chain of hills and mountains, in the east. The coastline is divided between five coastal districts, out of which three belong to the northern Konkan region and two to the southern Konkan region. As shown in table 15 below, Raigad district has the longest coastline and Greater Mumbai district the shortest.

**TABLE 15**  
**Coastal districts and length of coastline in Maharashtra**

Region	District	Coastline (in km)
Northern Konkan zone	Thane	112
	Mumbai	80
	Raigad	240
Southern Konkan zone	Ratnagiri	167
	Sindhudurg	121
<b>Total coastline</b>		<b>720</b>

Source: Department of Fisheries of Maharashtra.

The continental shelf area is endowed with a rich variety of marine fish, crustacean and mollusc species. It has been estimated that 40 varieties of edible marine fish and crustacean species are found in the coastal waters along the Maharashtra coast.

In 2003/2004, the total marine fish production of Maharashtra was 420 077 tonnes while the estimated fishery resource potential has been estimated as 630 000 tonnes. As shown in table 16 below, most of the presently not utilized potential is in the deep sea area beyond the 40 fathoms depth zone. Of the fishery resources in the area up to 40 fathoms, 82 percent are exploited both by small-scale fishermen and by the medium- and large scale commercial sector. One of the reasons why the offshore resources are not yet fully exploited and the deep sea resources not at all might be that it is not profitable to exploit certain areas and species under prevailing conditions considering the cost of fishing, market demand, prices and other factors.

**TABLE 16**  
**Fishery resources potential and production**

Depth zone	Estimated fishery resources potential (in tonnes)	Fish production in 2003 (in tonnes)
Inshore: up to 10 fathoms	329 000	420 077
Offshore: 10-40 fathoms	183 000	
Deep sea: beyond 40 fathoms	118 000	Negligible
<b>Total</b>	<b>630 000</b>	<b>420 077</b>

Source: Department of Fisheries of Maharashtra.

In 2002/2003, the fishing fleet of Maharashtra consisted of 14 284 vessels, of which 11 731 were mechanized. Table 17 shows the district-wise distribution of fishing vessels in Maharashtra. It is interesting to note that Greater Mumbai has the shortest coastline but the largest fishing fleet. This is related to the fact that Mumbai is the most important market for fish and aquatic products in the state.

**TABLE 17**  
**Distribution of fishing vessels over the coastal districts of Maharashtra**

District	Fishing vessels	
	Mechanized	Non- mechanized
Greater Mumbai	3 031	323
Thane	2 560	318
Raigad	2 384	729
Ratnagiri	2 492	595
Sindhudurg	1 264	588
<b>Total</b>	<b>11 731</b>	<b>2 553</b>

Source: Department of Fisheries of Maharashtra.

Regarding the fishing methods practiced and the fishing gear used by mechanized fishing vessels, the operation of trawlnets, bagnets and gillnets are the preferred fishing methods. Table 18 below shows that trawlers are concentrated in Ratnagiri and the Greater Mumbai district, bagnetters in Thane district and purse seiners in Ratnagiri while gillnetters can be found in all coastal districts.

**TABLE 18**

**District-wise distribution of mechanized fishing vessels by type of gear operated in Maharashtra**

District	Trawlers	Bagnetters	Gillnetters	Purse seiners	Longliners	Others
Mumbai	1525	920	406	70	8	102
Thane	0	1587	941	0	0	32
Raigad	168	982	773	48	47	566
Ratnagiri	1543	102	676	107	48	16
Sindhudurg	418	0	768	0	21	57
<b>Total</b>	<b>3654</b>	<b>3591</b>	<b>3564</b>	<b>225</b>	<b>124</b>	<b>773</b>

Source: Department of Fisheries of Maharashtra.

The fishing method most commonly used by small-scale fishermen is the operation of gillnets, while trawlers, longliners and purse seiners are exclusively operated by the commercial sector.

As far as the marine fish production is concerned, table 19 below shows that during the period from 1999 to 2004, the production slowly increased further notwithstanding a decline in 2002/2003.

**TABLE 19**

**Marine capture fishery production (in tonnes)**

Year	Marine fishery production
1999/2000	397 901
2000/2001	403 000
2001/2002	414 268
2002/2003	386 680
2003/2004	420 077

Source: Department of Fisheries of Maharashtra.

The inland capture fishery production of Maharashtra declined and stagnated since 1999/2000 as shown in table 20 below.

**TABLE 20**

**Inland capture fishery production (in tonnes)**

Year	Inland production
1999/2000	135 390
2000/2001	123 000
2001/2002	122 785
2002/2003	127 236
2003/2004	125 120

Source: Department of Fisheries of Maharashtra.

Brackish water prawn farming is practiced in all four rural coastal districts of Maharashtra on a limited scale. As in other parts of India, brackish water prawn farming in Maharashtra encountered many problems due to unsustainable culture practices, pollution and other factors, which resulted in prawn diseases, environmental damages and the closure of many prawn farms. Table 21 shows the production in 2003/2004.



**TABLE 21**  
**Brackish water prawn production of coastal districts (2003/2004)**

District	Brackish water prawn production (tonnes)
Thane	427
Raigad	353
Ratnagiri	70
Sindhudurg	118
<b>Total</b>	<b>968</b>

Source: Department of Fisheries of Maharashtra.

### ***Fishing regulations and leasing policies***

With the objective to ensure a sustainable use of fisheries and aquatic resources and to prevent the use of harmful fishing practices, the Maharashtra Marine Fishing Regulation Act came into force on 15 September 1982. It was modified on 12 June 1997.

The main regulatory activities carried out under this act are the registration and licensing of fishing vessels depending on engine capacity and tonnage, the regulation of mesh sizes and fishing gear dimensions, the registration of gear, the regulation of fishing seasons and areas and the imposition of penalties in case of non-compliance with the regulations. While the regulations apply to all fishing vessels regardless of whether they are operated by the commercial or small-scale sector, non-mechanized vessels operated by the traditional small-scale fisheries sector are exempted from some regulations.

A fishing vessel needs to be registered only once in its life time. The fishing vessels are broadly classified into mechanized and non-mechanized vessels. The registration fee is INR10 for a mechanized vessel and INR5 for a non-mechanized fishing vessel. In order to operate a fishing vessel, a licence is required, which is valid for a specific area and for a period of three years.

The licence fee increases with the size and horsepower of the vessel as shown in table 22 below.

**TABLE 22**  
**Fishing licence fees in Maharashtra**

Class of fishing vessel	Fees (in INR)
Mechanized fishing vessels with an engine exceeding 50 hp	500
Mechanized fishing vessels with an engine not exceeding 50 hp	200
Non-mechanized fishing vessels exceeding 3 tonnes	100
Non-mechanized fishing vessels not exceeding 3 tonnes	50

The penalty imposed on fishing vessels not following the fishing regulations are INR5 000 if the value of the fish caught is INR1 000 or less, five times the value of fish caught if the value of the fish is more than INR1 000 and INR5 000 in any other case including the case, where no fish has been caught by the vessel.

As far as regulations of fishing seasons, mesh sizes and fishing operations are concerned, the following regulations are in place. The fishing season is closed in Maharashtra from 10 June to 15 August or the local festival of Narali Purnima, whichever is earlier. Traditional non-mechanized fishing craft are allowed to continue operating during the closed season. This regulation benefits the traditional small-scale fisheries sector while the modern, mechanized small-scale fisheries sector has to observe the same rules as the large-scale commercial fisheries sector.

Purse-seine gear should not be operated by any mechanized fishing vessel within the territorial waters (12 nautical miles) of Greater Mumbai, Thane, Raigad, Ratnagiri and Sindhudurg district. Mechanized vessels, which operate purse seine gear, should not land their catch in any port other than

Mirkarwada port in Ratnagiri district. This regulation benefits the small-scale fisheries sector as it prevents commercial purse seiners from operating in the same fishing grounds and land and sell their catches at the same landing sites and harbours, which small-scale fisherfolk use.

No mechanized fishing vessel is allowed to operate a trawl net having a codend mesh size of less than 35mm within the territorial waters of Thane, Greater Mumbai, Raigad and Sindhudurg district. No trawl gear having a codend mesh size of less than 25 mm shall be operated by any mechanized fishing vessel within the territorial waters of Ratnagiri district. These regulations aim to prevent the catch of juvenile fish and long-term damages to fishery resources and also benefit the small-scale fisheries sector.

### ***Fisheries development schemes and agencies***

The Government of Maharashtra provides financial assistance and incentives to fishermen and women for various activities in the field of marine fisheries.

Examples are:

- assistance for improvement/mechanization of fishing boats: financial assistance covering up to 90 percent of the cost is provided by the state and central government to fishermen and women sponsored through cooperative societies;
- assistance for storage, transportation and sale of fish: financial assistance covering up to 90 percent of the cost is provided by the central government for acquisition of trucks and fuel trucks, installation of cold storages and ice making equipment;
- exemption from sales tax on diesel for fishing boats of less than 20 m in length to reduce the cost of fishing operations for medium and small-scale operators in the light of ever increasing fuel prices;
- subsidies for the purchase of fishing equipments;
- subsidies for the purchase/construction of non-mechanized boats by small-scale fish farmers.

There are also schemes for the promotion of fish farming, which aim to popularize fish farming, create employment opportunities, diversify aquaculture practices and provide assistance to fish farmers with a view to create a cadre of trained and well organized fish farmers, who engage in aquaculture full-time.

For the development of brackish water aquaculture, district-level brackish water fish farmers' development agencies (BFDAs) were established in each coastal district of Maharashtra. The BFDAs implement the following centrally sponsored schemes, which are jointly funded by central government (75 percent) and state government (25 percent):

- construction of new ponds and tanks on beneficiaries' own land with screened inlets, outlets and shallow tube wells: a subsidy of INR35 000 per ha and a maximum of 10 ha per farmer is available for this purpose;
- purchase of seed and fertilizer/manure for the first year of aquaculture operation: a subsidy of INR 5 000 per ha and a maximum of 10 ha per farmer is available for this purpose;
- construction of prawn hatchery: a subsidy of INR100 000 per hatchery or 10 percent of the construction cost, whichever is less, is available for this purpose;
- training in brackish water aquaculture: a stipend of INR50 per day per trainee is available for this purpose.

A freshwater fish farmers' development agency (FFDA) promotes the development of freshwater aquaculture and implements the following centrally sponsored schemes:

- repair of fish ponds: a subsidy of INR8 000 per ha and a maximum of 10 ha per farmer is available;

- purchase of seed and fertilizer/manure for the first year of freshwater aquaculture operations: a subsidy of INR6 000 per ha and a maximum of 10 ha per farmer is available;
- construction of ponds: a subsidy of INR40 000 per ha and a maximum of 10 ha per farmer is available;
- integrated fish farming: a subsidy of INR10 000 per ha is available;
- purchase of aerators: a subsidy of INR12 000 per ha is available;
- construction of freshwater prawn hatchery: a subsidy of INR10 000 per unit is available;
- construction of feed plant: a subsidy of INR10 000 per ha is available;
- training of fish farmers: a stipend of INR50 per day per trainee is provided by the FFDA.

As far as the leasing of brackish water areas for aquaculture is concerned, the Government of Maharashtra declared a new land leasing policy in 2001 to promote entrepreneurship among fisherfolk and to provide alternative livelihoods for the coastal population including fishermen and women, who want to become fish farmers. Lease amounts and premiums were reduced. Table 23 shows the new premium and lease structure.

**TABLE 23**

**Premium and lease structure for brackish water aquaculture**

Category	Premium (INR/ha)	Annual lease amount (INR/ha)
Traditional fisherman/woman	5 000	1 000
Cooperative society	10 000	1 500
Company/partnership firm	25 000	2 000

As can be seen from above description, the state of Maharashtra has a number of fisheries schemes and regulations, which are meant to assist the small-scale fisheries sector and women in fishing communities.

Many of the existing fisheries and fish farming development schemes could be used to support the livelihood opportunities for women and men in coastal fishing communities in Maharashtra, which are identified in chapter 4.4 below.

### **4.3 Marketing patterns and microfinance services**

An efficient marketing system ensures remunerative levels of income to fish farmers, fishermen and women by keeping the number of middlemen to a minimum, regulating market transactions in a fair and transparent manner and by ensuring competition between different market intermediaries.

The most important pelagic marine species, which enter the fish marketing system of Maharashtra, are mackerel, sardine, pomfret, silver belly, mullet, ribbon fish and seer fish. The most important demersal marine species are prawn, lobster, shark, squid, catfish, ray and sole.

#### ***Marketing patterns***

As far as fish marketing in the marine belt of Maharashtra is concerned, the study distinguished five different marketing channels, i.e.:

- I. producer (mechanized fishery sector) – wholesaler – retailer/fish vendor – consumer;
- II. producer (mechanized fishery sector) – retailer/vendor – consumer;
- III. producer (mechanized fishery sector) – commission agent – retailer/vendor – consumer;
- IV. producer (mechanized fishery sector) – wholesaler – commission agent – exporter;
- V. producer (mechanized and traditional fishery sector) – retailer/vendor – consumer.

Table 24 below shows for each of the five marketing channels the costs and profits of market intermediaries and producers as a percentage of the price paid by consumers or exporters.

**TABLE 24**

**Costs and profits of producers and fish market intermediaries in Maharashtra (as percentage of price paid by consumer/exporter)**

Market intermediary	Marketing channel (%)				
	I	II	III	IV	V
Retailer's profit	10	4	4	-	26
Retailer's cost	42	71	43	-	41
Commission agent's profit	-	-	5	25	-
Commission agent's cost	-	-	37	34	-
Wholesaler's profit	16	-	-	7	-
Wholesaler's cost	23	-	-	26	-
Price paid to producer (mechanized fisheries)	9	25	11	8	-
Price paid to producer (traditional fisheries)	-	-	-	-	33
Price paid by consumer/exporter	100	100	100	100	100

As can be expected, the fewer intermediaries there are in a marketing channel, the higher is the share of producers, i.e. fishermen, women and fish farmers in the price paid by consumers or exporters. In the case of marketing channels II and V, where there is only one intermediary between producer and consumer, the price paid to producers accounts for 25 percent and 33 percent of the price paid by consumers, respectively, while in the other marketing channels, where two intermediaries are involved, the price paid to producers ranges between 8 to 11 percent of the price paid by consumers or exporters.

When comparing the prices paid to producers to the profits of intermediaries, the prices paid to producers seem relatively low. In the case of marketing channel I, the profits earned by both wholesalers and retailers, after deducting their costs, are higher than the prices paid to producers, which also have to cover their costs of operation and capital. In the case of marketing channel IV, the profits earned by commission agents and wholesalers combined account for 32 percent of the price paid by exporters while the price paid to producers accounts only for 8 percent.

The reason for the comparatively low prices paid to producers has probably something to do with the fact that in addition to their marketing functions, wholesalers and commission agents, acting on behalf of fish processors and exporters, provide loans to fishermen and women towards their cost of operation. In return, fishermen and women are required to sell their catch to these wholesalers and commission agents at a price agreed on when receiving the loan. This price is usually below the common market rate.

Cooperatives do not provide any longer working capital loans and advances to their members. They have restricted their role to selling fishing inputs like diesel, net making materials, antifouling bottom paints and engine spare parts.

When comparing the shares of different intermediaries in the price paid by consumers and exporters, these shares differ depending on the marketing channel. In the case of export marketing, the profits of commission agents are much higher than those of the wholesalers involved, probably because of a lack of competition. The share of the profit of retailers in the price paid by consumers is highest in marketing channel V, where the fish is procured from traditional fishermen.

In order to increase the share of fishermen and women in the price paid by consumers and exporters, a strengthening of the role of fisheries cooperatives in fish marketing and post-harvest operations might be necessary. This would require, however, substantial changes in the functioning of fisheries cooperatives.

First of all, fishermen and women need to regain and retain control over their cooperatives through their elected representatives. All business activities carried out by fisheries cooperatives should be managed by professional managers with adequate operational freedom to perform their functions while being fully accountable to the members of the cooperative for their performance.

Secondly, cooperatives should remain free of government intervention in their day-to-day functioning and their business activities except for interventions of a regulatory nature as such interventions adversely affect the performance of a cooperative.

Thirdly, fisheries cooperatives should expand their role in post-harvest and value added fish processing activities and acquire their own infrastructure and equipment such as ice plants, refrigerated vans, cold storages and cold chains so that they can realize a remunerative price for their catch.

Furthermore, fisheries cooperatives should develop their own brand names for their products and use up-to-date marketing techniques. Fisheries cooperatives might also consider the hiring of marketing firms. The members of fisheries cooperatives need to be educated regarding quality grading and weighing of fish and fish products. Marketing information such as information on fish prices at various landing centres should be disseminated through mass media and cooperative societies.

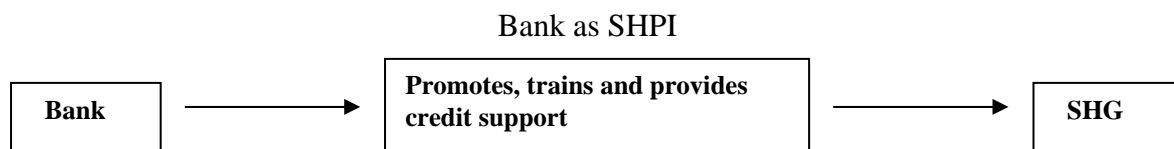
Last but not least, it should be considered to establish fish marketing committees similar to agricultural marketing committees, in order to ensure minimum prices for fish and fish products.

### ***Microfinance***

Microfinance to fishermen and women and other rural poor is provided by banks to members of self-help groups under different organizational arrangements and linkages. The following types of linkages between SHGs and banks have emerged in Maharashtra.

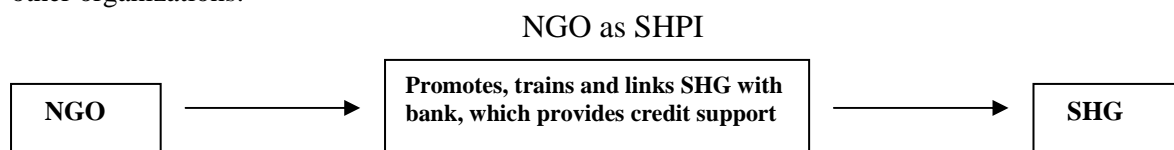
#### **I. Bank - SHG members (Bank as SHGPI)**

In this model, a bank functions as a self-help promoting institution (SHPI). The bank takes the initiative to form self-help groups, train their members and provide credit once the bank is convinced of the group's capacity to use and repay loans.



#### **II. Bank – NGO or government agency as SHPI- SHG members**

In this model, self-help groups are formed by NGOs or, in some cases, by government agencies, which provide training for the members of self-help groups. Banks provide credit directly to the SHGs and their members after observing their operations and capacity to absorb and repay loans. While banks provide loans directly to the self-help groups, the SHPIs continue their interactions with the SHGs. Most linkages between banks and SHGs begin with this model, where NGOs play a major role. The model has also been popular with banks because some of the complex and difficult functions of social interactions and dynamics with SHGs and their members are externalized and looked after by other organizations.



### III. NGO as MFI - SHG members

In some cases, banks are not in position to finance SHGs promoted by other agencies. In such cases, NGOs act as both facilitators and microfinance intermediaries (MFIs). At first, NGOs promote the formation of SHGs and train their members. After the NGOs are convinced that the members of the SHGs have the capacity to use and repay loans, they approach banks for loans, which they then use for re-lending to SHGs.

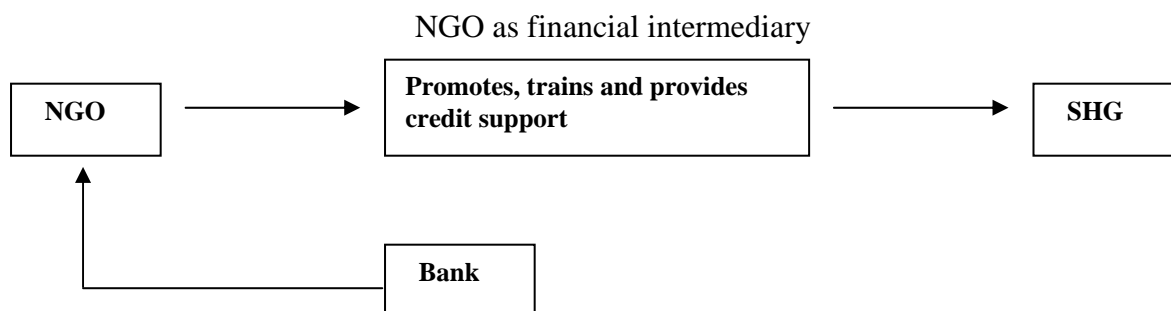


Table 25 below shows, that model II is the most common type of linkage between self-help groups and banks in Maharashtra, both in terms of the number of SHGs and of the amount of credit provided, followed by model I while model III is less common. As of 31 March 2004, altogether 38 535 SHGs in Maharashtra had received a total amount of INRmillion1 136.1 in loans from banks.

**TABLE 25**

**Bank – SHG linkages in Maharashtra (as of 31 March 2004)<sup>11</sup>**

Model	No. of SHGs	Loan amount (in INRmillion)
I - SHGs formed and financed by banks	14 113	384.98
II - SHGs formed by NGOs and financed by banks	24 151	746.60
III - SHGs financed by banks through NGOs	271	4.52
<b>Total</b>	<b>38 535</b>	<b>1 136.10</b>

Most SHGs receive loans from commercial banks, followed by regional rural banks and cooperative banks as shown in table 26 below.

**TABLE 26**

**Source of loans disbursed to SHG by type of financial institution<sup>12</sup>**

Financial institution	No. of SHGs linked	Loan amount (INRmillion)
Commercial bank	18 769	655.47
Regional rural bank	12 514	319.95
Cooperative bank	7 252	160.68
<b>Total</b>	<b>38 535</b>	<b>1 136.10</b>

In the four rural coastal districts of the Konkan region of Maharashtra, 2 017 SHGs had been formed as of 31 March 2004. They account for 5.2 percent of all SHGs in Maharashtra. These SHGs had received a total loan amount of INRmillion59.07. Table 27 below shows the district-wise distribution of SHGs and loans disbursed.

<sup>11</sup> Based on information obtained from NABARD and other financial institutions in Maharashtra.

<sup>12</sup> Based on information obtained from NABARD and other financial institutions in Maharashtra.

**TABLE 27**  
**District-wise distribution of SHGs and lending in Konkan region<sup>13</sup>**

District	No. of SHGs	Loan amount (in INRmillion)
Thane	671	20.58
Raigad	520	8.12
Ratnagiri	644	17.65
Sindhudurg	182	12.72
<b>Total</b>	<b>2 017</b>	<b>59.07</b>

Unfortunately, there are no statistics available regarding the nature of income generating activities and livelihoods of members of SHGs. Based on field observations during the study, it is estimated that 2 percent of all SHGs are involved in fisheries and fisheries related economic activities.

Among the regional rural banks of the Konkan region, Ratnagiri Sindhudurg Grameen Bank and Thane Grameen Bank play an important role in financing SHGs. Among the cooperative banks, Thane District Central Cooperative Bank, Raigad District Central Cooperative Bank, Ratnagiri District Central Cooperative Bank and Sindhudurg District Central Cooperative Bank are important financiers of SHGs.

Among the NGOs, Matru Mandir in Ratnagiri has promoted 209 SHGs, of which 200 have bank accounts and 38 have received loans. The Sadbhav Foundation in Raigad has promoted 104 SHGs, of which 104 have bank accounts and 59 have received loans. The Society for Initiative in Development and Directed Human Intervention (SIDDHI) in Ratnagiri has promoted 100 SHGs and the NGO Planning Rural Urban Integrated Development through Education in Raigad has promoted 99 SHGs, of which 49 have opened bank accounts.

To strengthen the SHG movement in the coastal districts of Maharashtra and to link SHGs with financial institutions, the following measures should be considered:

- Sensitization of bank staff: branch level as well as senior level bank staff needs to be sensitized regarding the concept of SHGs and familiarized with operational guidelines on lending to SHGs. Banks should also conduct training programmes for their staff in their own training facilities and encourage participation of their staff in training programmes organized by NABARD.
- Linking existing and eligible SHGs with banks: a large number of SHGs promoted by NGOs, government agencies, farmers' clubs and banks themselves have not yet received bank loans. Banks should consider financing SHGs as a business opportunity and give priority to SHGs, which have already started internal lending to their members using their own funds.
- Stamp duty exemption for SHGs: self-help groups are required to pay stamp duties of INR100 and INR20, respectively, to the State Government of Maharashtra for executing loan agreements with their members and loan agreements with banks each time, when an SHG obtains a loan from a bank. As the Government of Maharashtra has recently taken a decision to waive stamp duties payable by SHGs for availing bank loans, banks should extend this benefit to the SHGs, which are being financed by them.
- Monitoring: close monitoring of the progress at various levels is critical for an effective implementation of the SHG-bank linkage programme. Keeping in mind the priority accorded by the Government of India to the SHG-bank linkage programme, it should be made mandatory to report the progress made by banks to the Reserve Bank of India on a regular basis.
- Support from government departments: state government departments such as the Women and Child Welfare Department under the Ministry of Human Resource Development, the Social Welfare Department, the State Dairy Federation, the Agriculture Department and the

<sup>13</sup> Based on information obtained from NABARD and other financial institutions in Maharashtra.

Cooperation Department are promoting the formation of SHGs. These SHGs need to be classified according to their maturity and eligibility to receive credit by the concerned government departments. The departments should establish suitable management information systems at district level for this purpose and inform NABARD on a regular basis of the number of SHGs formed and their status and maturity to facilitate their credit linkage with banks. Like other government departments, the Department of Fisheries of Maharashtra should also play a role as self-help promoting institution with a special emphasis on coastal villages, where a sizable part of the population is involved in fisheries and fisheries related activities.

- Sustainability of existing SHGs: there is a need for capacity building measures for SHGs, which are already credit linked to ensure their sustainability. SHGs also require enterprise promotion support and other support services through the coordinated efforts of banks, NGOs and government agencies. The Department of Fisheries of Maharashtra together with fisheries research and training institutes should provide vocational training for members of SHGs, who are involved or interested in taking up fisheries related income generating activities.

#### **4.4 Opportunities for livelihood diversification and poverty alleviation**

Using participatory rural appraisal methods, the study identified a number of innovative fisheries related as well as non-fisheries livelihood activities, which can be undertaken by women and men in coastal fishing communities. The proposed livelihood activities take into consideration the availability of natural resources, basic vocational skills as well as market demand and access. The operational features and assumptions of the fisheries related livelihood activities and micro-enterprises as well as their capital and working capital requirements and components are described in Annex VII of this report.

The study carried out in Maharashtra cooperated with the study carried out in Orissa in standardizing the proposed fisheries related micro-enterprises, which can be undertaken in both states. This explains why the standard economics of these enterprises shown in Annex VII are identical. The standard economics are models, which should be adapted to the particular locality and circumstances, where the particular enterprise will be undertaken. Some of these models are based on earlier work undertaken by NABARD.

##### ***Small-scale and integrated fish farming***

- Composite fish farming in existing tanks with a water area of 0.4 ha and a culture period of 11 months: the capital cost involved is INR32 670 and the cost of operation is INR15 089. The expected annual income in the first year of operation is INR28 000 and INR35 000 from the second year onwards. Capital and working capital expenses can be financed by a loan with a repayment period of five years and a grace period of one year.
- Fish seed rearing in seasonal tanks with a water area of 0.2 ha, a culture period of four months and three culture cycles per year: the capital cost is INR59 049 and the cost of operation is INR12 863. The expected annual income from this activity is INR 63 000.
- Small-scale breeding unit for ornamental fish using four breeding tanks, two rearing tanks, two broodstock tanks, eight larvae rearing tanks and one bore well: the capital cost involved is INR53 800 and the working capital is INR24 600. The expected annual revenue is INR76 800.
- Integrated fish and poultry farming in a water area of 0.4 ha and a culture period of 11 months: the capital cost involved is INR62 728 and the cost of operation is INR27 388. The expected annual income in the first year of operation is INR40 000 and INR47 000 from the second year onwards.
- Composite fish and freshwater prawn farming in newly excavated tanks in a water area of 0.4 ha and a culture period of 11 months: the capital cost involved is INR105 338 and the cost of operation is INR25 161. The expected annual income in the first year of operation is INR54 250 and INR66 500 from the second year onwards.



### ***Small-scale shellfish farming***

- Brackish water prawn farming in a water area of 0.4 ha, a land area of 0.6 ha and a culture period of 120 days: the capital cost involved is INR29 053 and the cost of operation is INR50 189. The expected income after a 120-day culture period is INR75 000.
- Mussel raft culture using oil drums, mangrove wood logs and used purse seine netting: the capital cost involved is INR32 670 and the cost of operation is INR16 300. The expected annual income is INR50 000.
- Artemia culture on 1 ha of land: the capital cost involved is INR40 000 and the cost of operation is INR30 000. The expected annual income is INR91 000.
- Mud crab culture in a 0.1 ha pond and a culture period of 20 days: the capital cost involved is INR63 750 and the cost of operation is INR38 450. The expected annual income from four crops in the first year of operation is INR192 000 and the expected income from eight crops from the second year of operation onwards is INR384 000.

### ***Small-scale fish processing***

- Operation of small-scale fish drying plant for 150 days per year: the capital cost involved is INR411 400 and the cost of operation is INR2 532 550. The expected annual income in the first year of operation is INR2 193 750 and the expected income from the second year of operation onwards is INR2 925 000.

### ***Horticulture***

- Plantation of cashew nuts on 1 acre of land: the total cost incurred over a five-year period is INR12 000 and the expected income to be generated is INR19 600.
- Cultivation of coconuts on 1 acre of land: the total cost incurred over a five-year period is INR13 321 and the expected income to be generated is INR21 900.

In addition to above micro-enterprises, a number of income generating activities and other micro-enterprises were identified for each of the coastal districts and blocks within these districts. These include the collection of wild sea bass, mullet fry, penaeid prawn and freshwater prawn seed to be sold to fish farmers; manufacturing and repair of fishing nets, i.e. cast nets, demersal and pelagic trawlnets, purse seine nets, dolnets; animal husbandry with pigs, goats, cows and production of dairy products; growing/cultivation of fruits, vegetables, fodder, flowers and plants with medical properties by using minor irrigation techniques; brick making; making bamboo articles; quarrying laterite stones; fruit and cashew nut processing; agro-tourism and transportation; carpentry; operation of food stalls and village restaurants and various types of retail activities.

To enable women and men in coastal fishing communities of Maharashtra to engage in the income generating activities and micro-enterprises identified by the study, there is a need for vocational training support, training in small-scale business and enterprise management, marketing support as well as a need for microfinance and credit support.

There is also a need to improve rural infrastructure related to transportation, supply of electricity and safe drinking water, solid waste disposal as well as hygiene and health services and infrastructure. There is further a need to rehabilitate and conserve the coastal and aquatic environment and to regularly monitor its status, particularly with regard to coastal aquaculture and the processing and marketing of aquatic products.

## **4.5 Proceedings and recommendations of state-level workshop**

The state-level workshop, where the findings of the study in Maharashtra were presented and discussed by stakeholders, was attended by 48 participants representing fisherfolk associations, fish farmers, fisheries research and training institutions, NGOs and financial institutions. The list of participants is shown in Annex IV. The programme of the workshop is shown in Annex V.

The workshop commenced with a presentation on FAO's fisheries related policies and strategies and on the role of microfinance. This was followed by a presentation on the contribution of small-scale fisheries to poverty alleviation and rural development.

The presentation of the findings and recommendations of the study carried out in the Konkan belt of coastal Maharashtra was followed by four technical sessions. The presentations included presentations by fisheries scientists on innovative small-scale fish farming and processing technologies, which are of potential interest to women SHGs, and observations of stakeholders regarding the findings and conclusions of the study.

After each of the technical sessions, recommendations were formulated, which generally supported the action plan proposed in the study report. These recommendations were then discussed and adopted in the concluding plenary session. The plenary session also adopted the action plan, which had been proposed in the study report, a summary of which is attached as ANNEX VI to this report. The recommendations adopted in the concluding session addressed the following concerns.

### ***Capacity building and improving the cooperation between government, non-governmental and research organizations***

The focus here was on sensitization of staff of the Maharashtra Department of Fisheries and other relevant government agencies and academic institutions to the need for self-help group formation among women in coastal fishing communities and for strengthening the already existing groups and cooperative societies. Capacity building measures should include the design and distribution of audio-visual and other training and extension materials.

### ***Sensitization of fisherfolk and strengthening of their associations and self-help groups***

The recommendations made under this heading highlight the need for preparation of extension materials and manuals in Maharathi including a handbook on fish marketing, a study on the feasibility of networking among women's organizations and groups for improving their access to institutional credit, developing better marketing linkages, adopting co-management practices for fishery resources and coastal environment as well as the organization of district level workshops for capacity building of women cooperatives in the districts of Thane, Raigad, Ratnagiri and Sindhudurg.

To strengthen the SHG movement in the coastal districts of Maharashtra and to link SHGs with financial institutions, a number of measures were recommended. Sensitization of bank staff regarding the concept of SHGs and their familiarization with operational guidelines on lending to SHGs was considered crucial. Banks should conduct training programmes for their staff in their own training facilities and also encourage participation of their staff in training programmes organized by NABARD. It was observed that a large number of SHGs, which were formed with the support of NGOs, government agencies, farmers' clubs and banks have not yet received bank loans. Banks should give priority to financing SHGs, which have already started internal lending to their members.

It was further recommended to exempt SHGs from stamp duties when executing loan agreements with their members and banks and to make it mandatory to report the progress made by banks with the implementation of the SHG-bank linkage programme to the Reserve Bank of India on a regular basis.

As far as the support from government agencies to SHGs is concerned, it was strongly recommended that government agencies should establish suitable management information systems at district level for this purpose and inform NABARD on a regular basis on the number of SHGs formed and their status and maturity to facilitate their credit linkage with banks. Like other government departments, the Department of Fisheries of Maharashtra should play a role as self-help promoting institution with a special emphasis on coastal villages, where a sizable part of the population is involved in fisheries and fisheries related activities.

It was also observed that there is a need for capacity building measures for SHGs in the field of enterprise promotion support to ensure their sustainability. The Department of Fisheries of Maharashtra together with fisheries research and training institutes should provide vocational training for members of SHGs, who are involved or interested in taking up fisheries related income generating activities.

### ***Strengthening of the role of fishermen and women in fish marketing and post-harvest operations***

In order to increase the share of producers in the price paid by consumers and exporters, a strengthening of the role of fisheries cooperatives in fish marketing and post-harvest operations was recommended. Fisheries cooperatives should acquire their own infrastructure facilities such as ice plants, refrigerated vans, cold storages and cold chains so that they can realize a remunerative price for their products. Business activities should be managed by professional managers with adequate operational freedom to perform their functions while being fully accountable to the members of the cooperative society for their performance.

### ***Fisheries and aquaculture micro-enterprise development and diversification and supporting measures***

Recommendations under this topic include the design of a pilot project for providing marketing support to self-help groups and for exploring the access to new markets including those with export potential, the design and implementation of a pilot project for mud and swimming crab farming along the coast of the districts of Raigad and Ratnagiri and introduction of appropriate water quality monitoring and certification mechanism in support of small-scale marine aquaculture. It was also recommended that the Government of Maharashtra should support floor index prices for fish as in the case of other commodities. Another recommendation suggested common fishery policies and regulations for all maritime states in India rather than each state having its own and in many cases different fisheries regulations. It was further highlighted that as far as incentives and facilities are concerned, the fisheries sector lagged behind other sectors and should be brought on par with other sub-sectors of agriculture.

### ***Strengthening microfinance support to fishing and fish farming communities***

It was recommended that fisherfolk and women in fishing communities should be sensitized about the available sources of rural credit, microfinance and assistance from government. There should be a closer cooperation between financial institutions, fisheries research and training institutions and the fisheries administration to facilitate the flow of credit and microfinance for fisheries, aquaculture and post-harvest micro-enterprise development. It was further suggested that fisheries, aquaculture and post-harvest micro-enterprises should be brought under insurance coverage.

### ***Formulation of an externally funded technical cooperation project***

The plenary session recommended the formulation of an externally funded technical cooperation project, which should include pilot projects on innovative small-scale fish farming and post-harvest technologies and practices; exposure visits of fisherwomen to familiarize themselves with these technologies; capacity building measures and production and distribution of extension and training materials; providing marketing support and assistance in establishing marketing linkages as well as pilot projects on the participation of fisherwomen cooperatives and SHGs in fisheries and coastal resources management.



**LIST OF PARTICIPANTS OF STATE-LEVEL WORKSHOP IN ORISSA**

<b>Name of participant</b>	<b>Position/organization</b>
<b><i>Department of Fisheries, Orissa</i></b>	
1. Mr R.K. Mohanty	Joint Director of Fisheries (retired), AsDB consultant
2. Mr Narebdra Kumar Pradhan	District Fisheries Officer, Bhadrak district, CEO of DFDA and BFDA
3. Mr B. Kumar Maghi	District Fisheries Officer, Ganjam district, CEO of DFDA and BFDA
4. Mr J.K. Dash	District Fisheries Officer, Kendrapara district, CEO of DFDA and BFDA
5. Mr B. Munda	Assistant Director of Fisheries (Marine), Ganjam district
6. Mr G.S.P. Mishra	Deputy Superintendent of Fisheries, Ganjam district
7. Ms Krishna Kumari Koka	Deputy Superintendent of Fisheries, Ganjam district
8. Mr S. Panda	Marine Fisheries Extension Officer, Gopalpur-on-Sea, Ganjam district
<b><i>Samudram – federation of fisherwomen associations of Orissa</i></b>	
9. Ms B. Chitamma	President, Samudram
10. Ms M. Hadiama	Cashier, Samudram
<b><i>NGOs, foundations and self-help groups</i></b>	
11. Mr Mangaraj Panda	Secretary, United Artists' Association (UAA)
12. Ms S. Jena	Member of Subhadra fisherwomen self-help group, Manitiri, Kendrapara
13. Mr M.R. Das	NGO Manager
14. Prof D. Sahoo	Coordinator, Bio-village project, Kendrapara, M.S. Swaminathan Research Foundation
15. Ms Y. Sahoo	President of Subhadra fisherwomen self-help group, Manitiri, Kendrapara
16. Dr Vijay R. Subbiah	Project Coordinator, M.S. Swaminathan Research Foundation, Chennai
17. Mr Vishwanath Palled	Scientist, M.S. Swaminathan Research Foundation, Chennai
18. Ms G. Nayak	Social worker, bio-village project
<b><i>National Bank for Agriculture and Rural Development (NABARD)</i></b>	
19. Mr P.C. Mishra	General Manager and O.i.C., NABARD, Orissa
20. Mr Krishna Chandra Mohapatra	Assistant General Manager, NABARD, Kendrapara
21. Mr J. Maharana	Assistant General Manager, NABARD, Berhampur
22. Mr M.K. Srivastava	Assistant General Manager, NABARD, Ganjam District
23. Mr J.K. Samal	Manager, NABARD, Orissa
24. Mr B.K. Pattanaik	District Development Manager, NABARD, Badrak
25. Mr P.K. Mishra	Assistant General Manager, NABARD, Jagatsinghpur
26. Dr S. Siar	FAO Fishery Industry Officer
27. Dr U. Tietze	FAO Fishery Industry Officer

**PROGRAMME OF STATE-LEVEL WORKSHOP IN ORISSA**

*Workshop on Livelihood and Microfinance Support for Women in Coastal Fishing Communities in Orissa, Bhubaneswar, 23 April 2005*

10.00–10.30	Registration of participants
10.30–11.00	Inauguration - Welcome address by Mr M.A. Upare, General Manager, NABARD, study team leader - Address by Mr P.C. Mishra, General Manager and O.i.C., NABARD, Regional Office, Orissa - Address by Dr U. Tietze, FAO Fishery Industry Officer - Inaugural address by Mr Chandrasekar, Chief General Manager, State Bank of India, Orissa
<b>Technical session I</b>	
11.15–12.00	The role of FAO in credit and microfinance support for sustainable fisheries development, by Dr U. Tietze, FAO Fishery Industry Officer
12.00–12.30	Integrated fisheries development as key to rural development in coastal areas, by Dr Susana Siar, FAO Fishery Industry Officer
12.30–13.00	Presentation of report of study on livelihood assessment and microfinance programmes for women in coastal fishing communities in Orissa, by M.A. Upare, General Manager, NABARD
<b>Technical session II</b>	
14.00–15.30	Presentation of views and observations of fisheries department and fisheries research institutions
15.30–16.30	Presentation of views and observations of financial institutions, self-help groups and NGOs
16.30–17.00	Concluding session - Review of workshop proceedings, by Mr M.A. Upare, General Manager, NABARD - Concluding remarks by Dr U. Tietze, FAO Fishery Industry Officer - Vote of thanks, by Mr M.K. Srivastava, Assistant General Manager, NABARD, member of study team

## **ACTION PLAN FOR EMPOWERMENT OF FISHERWOMEN IN ORISSA**

The action plan is based on the findings of the study on livelihood opportunities and microfinance support for women in coastal fishing communities in the State of Orissa and on the rapid rural assessments of the potential and present utilization of natural resources, availability of skills, entrepreneurship and existing support facilities from various government agencies, NGOs, banks and educational institutions.

With the overall goal to contribute to poverty alleviation, the plan focuses on three major objectives:

- empowerment of women through expansion and strengthening of the self-help group movement among women in fishing communities and identification of new livelihood opportunities;
- sustainable utilization of natural resources by adopting eco-friendly practices;
- strengthening and promotion of entrepreneurship among women in rural fishing communities.

### ***Expansion of self-help group movement among women in fishing communities in coastal districts of Orissa***

According to the annual report of the Department of Fisheries of Orissa for the year 2000/2001, the total number of fisherwomen residing in the seven coastal districts of Orissa is 169 049. Of these, 86 140 women belong to marine fishing communities while 82 909 women belong to inland fishing communities.

As far as the number of self-help groups is concerned, there are presently 26 652 self-help groups in the seven coastal districts of Orissa. It is estimated that 2 663 SHGs are involved in fisheries related activities. The total membership of these SHGs calculated at 15 women per SHG is estimated at 39 945. It is thus estimated that 24 percent of fisherwomen in the coastal districts of Orissa are presently members of SHGs. The action plan proposes to expand the SHG movement to cover all 129 104 fisherwomen, who are presently not members of self-help groups. To achieve this aim it is proposed to form 8 605 new SHGs with a membership of about 15 members per group over the period from 2005 to 2010 at a rate of 1 721 SHGs per year.

The table below provides details for each of the coastal districts.

**TABLE 28**  
**SHGs in coastal districts of Orissa and potential for expansion**

Number of fisherwomen, SHGs/district	Balasore	Bhadrak	Jagatsinghpur	Kendrapara	Ganjam	Puri	Total
Fisherwomen population of marine sector	23 938	12 503	10 239	11 353	10 020	18 087	86 140
Fisherwomen population of inland fisheries sector	12 892	5 338	6 658	16 868	24 952	16 201	82 909
Total fisherwomen population of coastal districts	36 830	17 841	16 897	28 221	34 972	34 288	169 049
Present number of SHGs	5 867	3 650	5 307	5 000	5 260	1 568	26 652
Number of fisherwomen SHGs	586	365	530	500	526	156	2 663
Number of members @ 15 per group	8 790	5 475	7 950	7 500	7 890	2 340	39 945
Number of fisherwomen yet to be covered by SHG movement	28 040	12 366	8 947	20 721	27 082	31 948	129 104
Number of new fisherwomen SHGs to be formed @ 15 women per group	1 870	825	597	1 381	1 805	2 129	8 607

In order to expand the self-help group movement among fisherwomen and to achieve the above objectives, the following strategy and priorities are proposed.

***Sensitizing fisherwomen and expanding partnerships with self-help promoting institutions (SHPIs)***

Many fisherwomen are presently not aware of the self-help group movement. There is a need for awareness building and information. In order to conduct information campaigns and awareness building programmes, there is a need to find new partners, who are willing to function as self-help promoting institutions (SHPIs). The Department of Fisheries of Orissa, fish farmers' development agencies (FFDAs), brackish water farmers' development agencies (BFDAs), regional rural banks (RRBs), central cooperative banks (CCBs), NGOs as well as individuals all need to be encouraged and should consider playing a role as SHPI with regard to the expansion of the self-help group movement in the coastal districts of Orissa.

***Capacity building in cooperation with NABARD and Mission Shakti***

Mission Shakti was launched by the Government of Orissa on the International Women's Day 2001. The mission envisages strengthening existing self-help groups, promoting new self-help groups of poor women and providing support in the field of capacity building and training. It is proposed that NABARD, financial institutions, the Department of Fisheries of Orissa and Mission Shakti join hands and jointly embark on a capacity building programme for women in fishing communities in the coastal districts of Orissa.



Capacity building measures should focus on training of SHG members on bookkeeping and group dynamics, on income generating activities such as hygienic fish drying, fish farming, prawn farming, fish seed production, diversification of aquaculture to integrated fish farming i.e. fish-cum-vegetable farming, fish-cum-horticulture, fish-cum-livestock rearing and similar activities.

### ***Suitable micro-enterprises for women in coastal villages of Orissa***

Eight fisheries related micro-enterprises, which can be taken up by fisherwomen and their SHGs in the coastal belt of Orissa were identified by the study.<sup>14</sup>

They include the following activities:

Small-scale fish and integrated fish farming:

- composite fish farming in existing tanks;
- fish seed rearing in seasonal tanks;
- small-scale breeding unit for ornamental fish;
- integrated fish and poultry farming;
- composite fish and freshwater prawn farming in newly excavated tanks.

Small-scale shellfish farming:

- freshwater prawn farming in existing tanks;
- brackish water prawn farming.

Small-scale fish processing:

- small-scale fish drying plant.

In addition, three horticulture activities were found suitable to be undertaken by women in coastal villages of Orissa, i.e. the cultivation of coconuts on 1 acre, the cultivation of cashew nuts on 1 acre and the cultivation of casuarina trees on 1 ha of waste land.

### ***Graduating from microfinance client to micro-entrepreneur***

Microfinance can be a tool for poor fisherfolk households to increase their incomes by meeting working capital requirements as well as urgent consumption needs, manage risks better, enhance their earning capacity and thus reduce their economic and social vulnerability. The next step for many of the poor fisherfolk households and women, though not for all, is to start their own micro-enterprises or to develop their income generating activity further into a micro-enterprise.

While many fisherwomen are already involved in a self-employed activity such as traditional fish marketing and processing, there is a need for demonstration or pilot projects, which show how the traditional activities can be improved and transformed into micro-enterprises. There is also a need for supporting training, technical and financial assistance. Competent NGOs, research institutes and government agencies should provide technical and vocational skill training and training in entrepreneurship development. They should also carry out location specific feasibility studies of micro-enterprise opportunities and identify gaps in marketing and support services.

With regard to the findings of the studies, the following enterprise opportunities deserve priority attention:

- Hygienic fish drying with the use of solar dryers and hygienic drying platforms by Samudram, a federation of fisherwomen self-help groups in Ganjam district, should be supported. This should be accompanied by identification of new and more remunerative markets and marketing strategies for these products and by assisting the federation in pilot production and marketing operations.

---

<sup>14</sup> Their features and standard economics are shown in Annex VII of this report.

- Similarly, improvement of fish drying by SHGs at Bijay Chandpur and Attharbanki in Jagatsinghpur district should be supported by using mechanized and solar dryers and hygienic drying platforms. Training in the use of these dryers and assistance in finding more remunerative markets for more hygienic and durable dried fish products are needed.
- Traditional dried fish trade by fisherwomen SHGs at Mirzapur in Balaramgadi area of Balasore district should be supported by providing marketing assistance and training in basic bookkeeping and enterprise management.
- Assistance should be provided in shellcraft product and design development, in training of SHG members in shellcraft production and in the development of better marketing strategies for markets in Puri and Bhubaneswar. The formation of a marketing federation of SHGs should be promoted, which produce and sell shellcraft.
- Registration and data management of SHGs at the district level through DRDAs needs to be improved urgently following the example and initiative taken in Bhadrak district by the district administration and replicating it in other coastal districts of Orissa.
- Under the Support to Training for Women Empowerment Programme (STEP) of the Orissa State Government, the Department of Fisheries of Orissa and the Fisheries College of Berhampur are imparting training on value addition through preparation of pickled fish products, fish cutlets and similar products. There is an urgent need to identify markets and marketing strategies for these products and to assist SHGs in pilot production and marketing operations.

#### ***Credit linkage for fish drying micro-enterprises***

SHGs, which dry and market dried fish, can improve their access to credit for the necessary investments in hygienic fish drying and marketing equipment by storing their products in public storage facilities constructed under STEP of the Department of Fisheries and under the Rural Godown Scheme of the Government of India. Banks can provide credit to SHGs against pledge of dried fish owned by SHGs and kept in a public godown.

#### ***Diversification of aquaculture to integrated fish farming***

While the Department of Fisheries of Orissa has leased out many village ponds to SHGs for the purpose of fish farming, SHGs have not yet adopted integrated fish farming practices such as fish-cum-vegetable farming, fish-cum-horticulture and fish-cum-livestock rearing. The M.S. Swaminathan precision farming project in Kendrapara is demonstrating integrated fish farming technologies. It is proposed that Mission Shakti, NGOs and banks undertake a capacity building programme and train members of SHGs in inland fishing communities on integrated fish farming methods.

#### ***Streamlining of leasing policies of village ponds***

At present, 1 472 village ponds with an area of 1 993.27 ha have been leased out to 1 376 SHGs. There are many more ponds, which can be leased out to SHGs and the process should be expedited. Regarding the lease period, even though the Government of Orissa has issued lease directives for leasing village ponds for a period of five years, many ponds are presently leased out for shorter periods. With a view to encourage the sustainable use of ponds and to encourage, it is necessary to strictly adhere to the lease directives of the Government of Orissa.

#### ***Policy initiatives for leasing brackish water areas to SHGs***

The Government of Orissa has identified 32 587 ha, which are suitable for brackish water fish and prawn farming. Policy decisions should be initiated so that these areas can be leased by coastal fishing communities for the purpose of small-scale brackish water prawn farming.

#### ***Review of marine fishing regulations and policies with regard to their impact on livelihoods of women in coastal Orissa***

The Government of Orissa has imposed various restrictions on fishing from the Jatadhar river mouth to the Devi river mouth, from Chilka Lake to the mouth of the Rushikulya River and adjacent to and

around the Bhitarkanika Wild Life Sanctuary. The restrictions are related to the protection of sea turtles and other conservation issues. There are further restrictions to fishing off the coast of Balasore and Bhadrak related to a missile testing range.

All these restrictions have a very negative impact on the livelihoods of coastal fishing communities. There is a need to carry out quantitative and qualitative assessments of the impact of these regulations on the livelihoods of coastal fishing communities and to identify measures, which rehabilitate and protect their livelihoods.

### ***Exposure visits of SHGs to familiarize themselves with innovative livelihood technologies***

It is suggested to arrange exposure visits for members of suitable SHGs in Orissa to observe how other fisherfolk SHGs in India have successfully adopted innovative fisheries related micro-enterprises. Examples are the use of solar fish dryers in Visakhapatnam, Andhra Pradesh; ornamental fish breeding in Bishnupur village of North 24 Paragana District, West Bengal; small-scale pearl culture in Tamil Nadu and crab fattening in Kerala.

### ***Improving rural infrastructure***

During the study it was found that many coastal fishing villages in Orissa lack essential rural infrastructure such as all-weather roads, safe drinking water, electricity, appropriate fish landing centres, sanitary and solid waste disposal facilities, health, educational and other infrastructure. The lack of infrastructure has a very negative impact on the livelihoods of coastal fisherfolk. It is proposed that the Government of Orissa avails itself of funding from NABARD's Rural Infrastructure Development Fund (RIDF) for providing infrastructure facilities to coastal fishing villages.

### ***Formulation of technical cooperation project***

Considering that 48 percent of the population of Orissa fall below the poverty line and the initiatives already taken by government agencies, financial institutions and NGOs, to provide livelihood and microfinance support to the population of the coastal districts of the state, there is a need for support from international organizations for the preparation of a technical cooperation project, which would give a boost to the already existing local initiatives. The technical cooperation project should concentrate on capacity building, implementation of pilot projects and organization of exposure visits and particularly focus on women in coastal fishing communities and on their SHGs.

**LIST OF PARTICIPANTS OF STATE-LEVEL WORKSHOP IN MAHARASHTRA**

<b><i>Dr B.S. Konkan Agricultural University</i></b>	
1. Dr K.D. Kokate	Director of Extension Services
2. Dr N.D. Jambhale	Director of Research
3. Dr R.K. Singh	Officer-in-charge, Research, Tarapolevala Marine Biological Research Station
4. Dr A.M. Ranade	Senior Scientific Officer, Tarapolevala Marine Biological Research Station
5. Dr S.G. Belsare	Senior Scientific Officer (retired), Tarapolevala Marine Biological Research Station
6. Ms Suchitra M. Upare	Assistant Research Officer, Tarapolevala Marine Biological Research Station
<b><i>Fishery Survey of India</i></b>	
7. Mr Dewanand E. Uikey	Fishery Survey of India
<b><i>College of Fisheries, Ratnagiri</i></b>	
8. Dr P.C. Raje	Associate Dean
9. Dr S.R. Kovale	Head of Department (Fishery Biology)
10. Dr M.S. Chandage	Head of Department (Fishery Resource Economics and Statistics)
11. Mrs Swapnaja A. Mohite	Assistant Professor
12. Mr A.S. Pawase	Assistant Professor
<b><i>Central Institute of Fisheries Education</i></b>	
13. Dr S.K. Mukherjee	Director and Vice-Chancellor
14. Dr M.P.S. Kohli	Principal Scientist
15. Prof S.D. Singh	Principal Scientist and Head, Division of Fish Nutrition, Bio-chemistry and Post-harvest Technology
16. Dr S.D. Tripathi	NACA Special Advisor, Ex-Director of CIFE
<b><i>Agricultural Research Station, Karjat</i></b>	
17. Dr V.B. Ingale	Director of Research
<b><i>Marine Products Development Exports Authority (MPDA), Panvel</i></b>	
18. Dr A.S. Upadhyay	Deputy Director (Aquaculture)
<b><i>Ratnagiri Sindhudurg Gramin Bank</i></b>	
19. Mr V.V. Buche	Chairman
<b><i>Raigad District Cooperative Bank</i></b>	
20. Ms V.V. Langi	Manager
<b><i>NABARD</i></b>	
21. Mr M.A. Upare	General Manager, Technical Services Department
22. Mr R.V. Reddy	Manager, Maharashtra Regional Office
<b><i>Farm Science Centre, Ratnagiri</i></b>	
23. Mr M.M. Ghughuskar	Training Associate
<b><i>Khar Land Research Station, Panvel, Raigad district</i></b>	
24. Dr S.S. Dhane	Officer-in-Charge
25. Mr P.E. Shingare	Scientist (Fisheries)
26. Mr S.J. Meshram	Junior Scientist (Fisheries)
<b><i>Samaj Vikas Trust</i></b>	
27. Mrs Deshmukh	President, Panvel, Raigad district
<b><i>Fisheries cooperatives and associations</i></b>	
28. Mr M.V. Vaity	Manager, Arnala Fisheries Cooperative Society, Thane

29. Ms Tare	Sindhusagar Fisheries Cooperative Society, Mahim, Mumbai
30. Mr S.T. Dhuri	Vice-Chair, Deogad Fisheries Cooperative Society, Sindhudurg district
31. Mr N.S. Bandekar	Deogad Fisheries Cooperative Society, Sindhudurg district
32. Mr P.S. Metar	Secretary, Shree Ganesh Fisheries Cooperative Society, Ltd., Nivati, Sindhudurg district
33. Mr A.C. Sarang	Shree Ganesh Fisheries Cooperative Society, Ltd., Nivati, Sindhudurg district
34. Mr Ramdas Sandhe	Maharashtra Fisheries Cooperative Society, Versova, Andheri, Mumbai
35. Mr T.K. Tare	Chairman, Utkarsh Fisheries Multi-functional Society Ltd., Murbe, Thane
36. Mr. Mr K.D. Paul	Secretary, Utkarsh Fisheries Multi-functional Society Ltd., Murbe, Thane
37. Mr N.D. Shinde	Malhari Martand Fisheries Cooperative Society Ltd., Colaba
38. Mr Vishal Dhake	Malhari Martand Fisheries Cooperative Society Ltd., Colaba
39. Mr P.C. Worlikar	Fisherman, Worli, Mumbai
<b><i>Fish farmers</i></b>	
40. Mr A.B.Patil	Managing Director, Pancham Aquaculture Farms Ltd., Mumbai
41. Mr C.V. Naik	General Manager, Pancham Aquaculture Farms Ltd., Mumbai
42. Mr R.R. Sawant	Fish farmer, Ghatkopari (West), Mumbai
43. Mr J.B. Sakpal	Fish farmer, Goregaon (West), Mumbai
44. Mr S.S. Singh	Fish farmer, Goregaon (West), Mumbai
45. Mr R.D. Tangi	Fish farmer, Goregaon (West), Mumbai
46. Mr D.V. Shinde	Fish farmer, Chiplun, Ratnagiri
<b><i>FAO</i></b>	
47. Dr S. Siar	FAO Fishery Industry Officer
48. Dr U. Tietze	FAO Fishery Industry Officer

# PROGRAMME OF STATE-LEVEL WORKSHOP IN MAHARASHTRA

*Workshop on access of women in fishing communities in coastal Maharashtra to markets, credit and livelihood opportunities, 29 – 30 April 2005, CIFE Auditorium, Versova, Andheri (West), Mumbai*

<b>29 April</b>	
9.30 – 10.00	Registration of participants
10.00 – 14.00	<p>Inaugural session</p> <ul style="list-style-type: none"> <li>- Felicitation and welcome ceremony</li> <li>- Introductory speech by Dr N.D. Jambhale, Director of Research, Dr B.S. Konkan Agricultural University</li> <li>- Address by Dr U. Tietze, FAO Fishery Industry Officer</li> <li>- Address by Chief Guest, Dr S.A.H. Abidi, Member, Agricultural Scientists Recruitment Board, Department of Agricultural Research and Education, Government of India</li> <li>- Address by Chairman, Dr S.S. Magar, Vice-Chancellor, Dr B.S. Konkan Agricultural University</li> <li>- Vote of thanks, by Dr P.C. Rajee, Associate Dean, College of Fisheries, Ratnagiri</li> </ul>
<b>Technical session I. Chairperson: Dr S.D. Tripathi, co-chairperson: Dr N.D. Jambhale, rapporteur: Dr S.R. Kovale</b>	
14.00 – 14.30	Role of FAO in credit and microfinance support for sustainable fisheries development, by Dr U. Tietze, FAO Fishery Industry Officer
14.30 – 15.00	The contribution of integrated fisheries development to rural development, by Dr Susana Siar, FAO Fishery Industry Officer
15.00 – 15.30	Presentation of findings of study on access of women in fishing communities in coastal Maharashtra to markets, credit and livelihood opportunities, by Mrs Suchitra M. Upare, Assistant Research Officer
15.30 – 16.00	Findings of study on livelihood assessment and microfinance programmes for women in coastal fishing communities in Orissa, by Mr M.A. Upare, General Manager, NABARD
<b>Technical session II. Chairperson: Mr M.A. Upare, co-chairperson: Dr U. Tietze, rapporteur: Dr M.S. Chandage</b>	
16.00 -16.30	Observations of stakeholders from Thane district, by Mr M.V. Vaity, Arnala Fisheries Cooperative Society
16.30 – 17.20	Sustainable crab farming technology for improving livelihood opportunities of fishing communities in Konkan region, by Dr S.G. Belsare, Marine Biological Research Station, Ratnagiri

17.20 – 17.40	Observations of stakeholders from Mumbai district, by Ms Tare, Sindhisagar Fisheries Cooperative Society
<b>30 April</b>	
<b>Technical session III. Chairperson: Dr P.C. Raje, co-chairperson: Dr S.R. Kovale, rapporteur : Dr M.S. Chandage</b>	
10.00 - 10.30	Conserving and monitoring fishery resources by involving stakeholders, by Mr D.E. Uikey, Fishery Survey of India
10.30 – 11.00	Experiences with providing credit to fisherfolk, by Mr V.V. Buche, Ratnagiri Sindhurg Grameen Bank
11.00 – 11.30	Possibilities and prospects of prawn farming in agricultural waste land with high salinity in western Maharashtra, by Dr A.S. Upadhyay, MPEDA
11.30 – 12.00	Fish marketing and price fluctuations of fish in Ratnagiri block, by Dr M.S. Chandage, College of Fisheries, Ratnagiri
12.00 -12.30	Alternative livelihood opportunities for fisherfolk, by Dr K.D. Kokate, Dr B.S. Konkan Agricultural University
<b>Technical session IV. Chairperson: Dr K.D. Kokate, co-chairperson: Dr A.M. Ranade, rapporteur: Dr S.R. Kovale</b>	
12.30 – 13.00	Status of fisherwomen cooperative societies in Ratnagiri district, by Mrs S.A. Mohite, College of Fisheries, Ratnagiri
13.30 – 14.00	The fish marketing system along the southern Konkan coast, by Mr M.M. Ghughuskar, College of Fisheries, Ratnagiri
14.00 – 14.30	The role of women in coastal fisheries, by Dr S.D. Tripathi
14.30 – 15.00	Experiences of non-governmental organizations in forming women self-help groups in Raigad district, by Mrs Deshmukh, Samaj Vikas Trust
15.00 – 15.30	Experiences of entrepreneurs with government sponsored training programmes on prawn farming, by Rama Bhagat, entrepreneur
15.30 – 16.00	Role of NABARD in microfinance and fisheries development, by Mr R.V. Reddy, Maharashtra Regional Office
<b>Plenary session. Chairperson: Dr S. Siar, co-chairperson: Dr N.D. Jambale</b>	
16.00 – 17.00	Presentation and adoption of recommendations of technical session I, by Dr S.D. Tripathi Presentation and adoption of recommendations of technical session II, by Mr M.A. Upare Presentation and adoption of recommendations of technical session III, by Dr P.C. Raje Presentation and adoption of recommendations of technical session IV, by Dr N.D. Jambhale

## **ACTION PLAN FOR CAPACITY BUILDING AND EMPOWERMENT OF FISHERWOMEN AND THEIR COMMUNITIES IN MAHARASHTRA**

### ***Principles and objectives***

The action plan for capacity building and empowerment of fisherwomen and their associations and communities in the coastal areas of Maharashtra is based on the semi-structured interviews of stakeholders, rapid market assessments and participatory rural appraisals, which were carried out in the course of the study. The action plan has the following underlying principles and objectives:

- utilization of natural resources within the reach of poor coastal fisherfolk;
- sustainable low input interventions as a source of livelihood;
- easy access to local institutions for free flow of information, training and acquiring skills and knowledge;
- generation and sustenance of small enterprises that can be handled exclusively by women;
- linking more women groups with microfinance institutions;
- improving access of fisherfolk to centralized, larger and more remunerative markets.

### ***Expansion of self-help group movement***

Census data of 2003 of the Department of Fisheries of Maharashtra show the marine fisherwomen population in the five coastal districts of the Konkan belt of Maharashtra, where the study was conducted, as 96 099.

**TABLE 29**

**Fisherfolk and fisherwomen population of coastal districts of Maharashtra**

<b>District</b>	<b>Total fisherfolk population (incl. men and children)</b>	<b>No. of fisherwomen</b>
Greater Mumbai	35 693	13 091
Thane	40 434	29 199
Raigad	61 588	21 768
Ratnagiri	57 736	22 963
Sindhudurg	22 586	9 078
<b>Total</b>	<b>218 037</b>	<b>96 099</b>

Assuming that at present, about 5 percent of all fisherwomen in Maharashtra are members of SHGs, cooperatives or associations, it is estimated that 4 805 fisherwomen are presently members of a fisherwomen group or association while 91 294 women do not belong to a group or association. The action plan assumes further that efforts to empower fisherwomen as well as capacity building efforts would benefit from fisherwomen associating themselves in self-help groups, fisherwomen cooperatives or similar forms of associations.

The action plan thus proposes to form 4 004 new self-help groups with 12 members each so that 48 048 additional fisherwomen and thus altogether about 50 percent of the fisherwomen of the five coastal districts of Maharashtra would be associated in groups.

The formation of SHGs should be facilitated by state government agencies such as the Department of Fisheries of Maharashtra in close cooperation with the district rural development agencies (DRDAs) and local NGOs. Formation of SHGs and capacity building efforts should focus on the priorities and involve the partners identified below.

### ***Sensitization of fisherwomen***

In most of the villages surveyed, with the exception of the villages of Varavade, Dhakti Dahanu and Agrav, fisherwomen were not fully aware of the self-help group movement and of the benefits



associated with this programme. An awareness building and information campaign needs to be organized for sensitizing coastal fisherwomen in the Konkan belt of Maharashtra.

### ***Government support***

As the Maharashtra State Government through its State Department of Fisheries plays a vital role in facilitating the various schemes aimed at the fisheries sector, a special scheme for formation of self-help groups among fisherwomen and for capacity building of the newly formed self-help groups should be formulated and implemented. The implementation of such a scheme would also make it easier for the newly formed groups to access formal sources of microfinance and rural credit in order to obtain capital needed to start up income generating activities and micro-enterprises.

The formation of separate fisherwomen cooperative societies should be encouraged by the Government of Maharashtra and its Department of Fisheries. With a view to generate income for fisherwomen, fisherwomen SHGs and cooperatives should be given priority when leasing out water bodies, which are under the control of the state or local government.

The Government of Maharashtra should further appoint women trainers, who should act as an interface between SHG group members and government agencies.

### ***Partnerships***

District rural development agencies should be active partners in all capacity building programmes for fisherwomen SHGs. DRDAs should appoint exclusively fishery related institutions as trainers in capacity building programmes and for suggesting and monitoring fisheries related economic activities carried out by fisherwomen SHGs and fisherwomen cooperatives.

### ***Sensitization programme for state and local government officers and NGO workers involved in development work in coastal areas of Maharashtra***

Orientation courses should be organized for grassroot level social workers such as village workers or gram sevaks for the identification of fishery related economic livelihoods for fisherwomen. Orientation courses should also be organized for staff concerned with women and child development. Likewise, training on livelihood opportunities for fisherwomen should be organized for NGOs working in coastal blocks.

### ***Publication of training and monitoring booklets***

Training and information manuals and materials for creating awareness and sustaining fishery and other economic activities as well as manuals for monitoring the activities of SHGs should be provided to SHGs. The monitoring manuals should reflect the specific profile of each SHG as this will enable both the group members and the institutions and organizations which cooperate with a particular SHG, to assess and monitor the performance of that particular SHG.

Success stories of SHGs need to be published and circulated among newly formed SHGs. Each fisherwomen SHG should be identified based on the specific fishery related activity carried out by the members of the SHG, i.e. coastal aquaculture, improved and hygienic drying of fish, preparation of value added fish products and fish vending rather than mentioning only fisheries as a broad term.

### ***Institutional linkages for strengthening livelihood activities***

Linkages need to be established between fisherwomen SHGs and fisheries research and training institutions, which can assist fisherwomen SHGs in the identification of fishery related livelihood opportunities and micro-enterprises and provide training and support during the initial phase of newly established micro-enterprises and economic activities. This work should become part of the regular outreach activities of the concerned institutions.

In the southern Konkan region comprising the districts of Ratnagiri and Sindhudurg, the College of Fisheries, Ratnagiri, may officially provide technical support in terms of identifying suitable fisheries

related economic activities and monitoring the progress of new livelihood activity in the field of fisheries. For economic activities in the field of agriculture and horticulture, the Farm Science Center (Krishi Vigyan Kendra), affiliated with the Dr B. S. Konkan Agriculture University, may provide technical support services.

For the northern Konkan region comprising the districts of Thane and Raigad, the Taraporevala Marine Biological Research Station (TMBRS) should be the interface for technical support services to fisherwomen SHGs.

### ***Suitable micro-enterprises for women in coastal villages of the Konkan belt of Maharashtra***

Nine fisheries related micro-enterprises were identified by the study in coastal villages of the Konkan belt of Maharashtra.<sup>15</sup>

Small-scale fish and integrated fish farming:

- composite fish farming in existing tanks;
- fish seed rearing in seasonal tanks;
- small-scale breeding unit for ornamental fish;
- integrated fish and poultry farming;
- composite fish and freshwater prawn farming in newly excavated tanks.

Small-scale shellfish farming:

- mussel raft culture;
- artemia culture;
- mud crab culture.

Small-scale fish processing:

- small-scale fish drying plant.

In addition, two horticulture activities were found suitable to be undertaken by women in coastal villages of the Konkan belt, i.e. the cultivation of coconut trees and the cultivation of cashew nut trees on one acre each.

### ***Exposure visits and networking of women self-help groups***

In order to initiate working relationships between fisherwomen SHGs and fisheries research and training institutions, it is suggested that DRDAs should arrange exposure visits of women SHGs to these institutions for the following purposes:

- College of Fisheries, Ratnagiri: familiarization with pearl and mussel culture;
- Taraporevala Marine Biological Research Station (TMBRS): familiarization with artemia cyst production technology;
- Marine Biological Research Station (MBRS): familiarization with ornamental fish culture and crab culture;
- Central Institute of Fisheries Education (CIFE): familiarization with value added fish products.

To provide exposure to successful small-scale fishery technology interventions adopted by other states, exposure visits may be arranged to Visakhapatnam, Andhra Pradesh, for familiarization with solar drying technology, to Kerala for familiarization with small-scale mussel culture and crab fattening practices and to West Bengal for familiarization with small-scale ornamental fish culture.

---

<sup>15</sup> Their features and standard economics are shown in Annex VII of this report.

Networking of coastal fisherwomen groups should be initiated within each district so that experiences can be shared and cooperation between different groups can be initiated. During the study it was observed that fisherwomen do not have much exposure or communication with women from other fishing villages due to the lack of telecommunication facilities, transportation and remote locations.

***Health support camps***

Health support camps should be organized to link fisherwomen SHG members to primary health centers, both for routine and emergency health services and to provide fisherwomen with authentic group membership cards.

## FEATURES AND STANDARD ECONOMICS OF FISHERIES-RELATED MICRO-ENTERPRISE OPPORTUNITIES FOR WOMEN OF COASTAL FISHING COMMUNITIES OF ORISSA AND MAHARASHTRA

### *Small-scale fish and integrated fish farming*

#### 1. Composite fish farming in existing tanks (Maharashtra and Orissa)

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Water area: 0.4 ha</li> <li>• Culture period: 11 months</li> <li>• Production: 800 kg in first year and 1 000 kg from second year onwards</li> <li>• Farm gate price: INR35 per kg of fish</li> <li>• Repayment period of loan for capital investment and cost of operation: five years with a one year grace period.</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Cleaning and repair of dyke and tank	1	500	500
Removal of silt	1290 m <sup>3</sup>	23	29 670
Repair of water in- and outlet	1	1 000	1 000
Fish farming equipment	1 set	500	500
Lease of tank	1	1 000	1 000
<i>Sub-total(capital cost)</i>			32 670
<i>Cost of operation</i>			
Lime	400 kg	5.5 per kg	2 200
Cow dung	4 500 kg	0.2 per kg	900
Urea	90 kg	5 per kg	450
Single super phosphate	125 kg	4 per kg	500
Fish seed including transportation	2 000 seeds	0.6 per seed	1 200
<i>Supplementary feed</i>			
Groundnut oil cake	470 kg	13 per kg	6 110
Rice bran	470 kg	3 per kg	1 410
Medicines for treatment and prevention of fish diseases	1 set	500	500
Harvesting expenses	Harvest of 800 kg	1 per kg	800
Insurance	INR12 770 as cost of operations minus medicines, harvesting expenses and miscellaneous cost	2.5% of cost of operations minus medicines, harvesting expenses and miscellaneous cost	319
Miscellaneous cost			700
<i>Sub-total(cost of operation)</i>			15 089
<i>Grand total (capital cost plus cost of operation)</i>			47 759
<i>Revenue</i>			
<i>Income during first year</i>			28 000
<i>Annual income from second year onwards before loan repayment</i>			35 000

## 2. Fish seed rearing in seasonal tanks (Maharashtra and Orissa)

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Water area: 0.2 ha</li> <li>• Culture period: 4 months</li> <li>• Culture cycles: 3</li> <li>• Production of fish fry per culture cycle: 300 000 fry</li> <li>• Farm gate price: INR7 000 per 100 000 fry</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Clearing of vegetation and repair of dyke	1	1 000	1 000
Excavation of tank	1863 m <sup>3</sup>	23 per m <sup>3</sup>	42 849
Construction of water inlets	10	500	5 000
Fish farming equipment	1 set	2 000	2 000
Nets for harvest of seed	8 kg	400 per kg	3 200
Construction of watchman shed/store	10 m <sup>2</sup>	500 per m <sup>2</sup>	5 000
<i>Sub-total(capital cost)</i>			59 049
<i>Cost of operation for one production cycle</i>			
Lime	50 kg	5.5 per kg	275
Cow dung	2 000 kg	0.2 per kg	400
Urea	55 kg	5 per kg	275
Single super phosphate	55 kg	4 per kg	220
Kerosene	10 litre	8 per litre	80
Micronutrients	1	500	500
Seed including transport	600 000	550 per 100 000 seed	3 300
<i>Supplementary feed</i>			
Groundnut oil cake	18 kg	13 per kg	234
Rice bran	18 kg	3 per kg	54
Medicines for treatment and prevention of fish diseases	1 set	500	500
Marketing expenses	Value of harvest INR17 500	3% of value	525
Services of two watchmen	2 months	1 500 per month/person	6 000
Miscellaneous cost			500
<i>Sub-total(cost of operation)</i>			12 863
<i>Grand total (capital cost plus cost of operation)</i>			71 912
<i>Revenue</i>			
<i>Annual income</i>			63 000

## 3. Small-scale breeding unit for ornamental fish (Maharashtra and Orissa)

<i>Item of capital/operational expenditure and income</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>	
Construction of low cost shed of 300 ft <sup>2</sup> area	10 000
Four cemented breeding tanks	10 000
Two cemented rearing tanks	5 600
Two cemented broodstock tanks	5 600
Eight cemented larvae rearing tank	9 600
Bore well with 1 hp pump	8 000
Oxygen cylinder with accessories	5 000
<i>Sub-total(capital cost)</i>	53 800

<i>Cost of operation</i>	
800 female and 200 male fish @ INR2.50/fish	2 500
Fish feed (150 kg/year @ INR20/kg)	3 000
Nets	1 500
Electricity and fuel @ INR250/month	3 000
Wages @ INR1 000/month	12 000
Miscellaneous cost	2 600
<i>Sub-total</i>	24 600
<i>Cost of interest and depreciation</i>	
Interest on fixed capital @ 15% p.a.	8 070
Interest on working capital at 15% p.a.	3 690
Depreciation of capital @ 20% p.a.	10 760
<i>Cost of operation plus cost of interest and depreciation</i>	47 120
<i>Revenue</i>	
Income from sale of 76 800 fish @ INR1 per fish @ 40 female fish from three cycles @ survival rate of 80%	76 800
<i>Net income</i>	29 680

#### 4. Integrated fish and poultry farming (Maharashtra and Orissa)

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Water area: 0.4 ha</li> <li>• Culture period: 11 months</li> <li>• Production. Fish: 800 kg in first year and 1 000 kg from second year onwards. Poultry: 200 chickens per year at 1.5 kg per chicken.</li> <li>• Farm gate price: INR35 per kg of fish. INR40 per kg of chicken.</li> <li>• Repayment period of loan for capital and operational cost: five years with one year grace period.</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Dyke improvement	1	500	500
Excavation of tank	2 336 m <sup>3</sup>	23 per m <sup>3</sup>	53 728
Construction of water inlet and outlet	1	2500	2 500
Fish farming equipment	1 set	500	500
Poultry shed for 100 chickens @ 1 ft <sup>2</sup> per chicken	100 ft <sup>2</sup>	50 per ft <sup>2</sup>	5 000
Bird feeder and water supply	100	5 per feeder/water supply	500
<i>Sub-total(capital cost)</i>			62 728
<i>Cost of operation</i>			
Lime	400 kg	5.5 per kg	2 200
Urea	90 kg	5 per kg	450
Single super phosphate	125 kg	4 per kg	500
Fish seed including transportation	2 000 seeds	0.6 per seed	1 200
Purchase of one day old chickens (3% extra)	206	14 per chicken	2 884
<i>Supplementary feed</i>			
Groundnut oil cake	470 kg	13 per kg	6 110
Rice bran	470 kg	3 per kg	1 410
Poultry feed @ 3.15 kg/chicken	630 kg	10 per kg	6 300
Medicines for treatment and prevention of fish diseases	1 set	1 500	1 500
Labour cost	1 000 per month	3 months	3 000
Harvesting expenses	Harvest of 800 kg of fish	1 per kg	800

Insurance	INR 21 354 as cost of operations minus medicines, harvesting expenses and miscellaneous cost and INR1.5 per chicken	2.5% of cost of operations minus medicines, harvesting expenses and miscellaneous cost and INR1.5 per chicken	534
Miscellaneous cost			500
<i>Sub-total(cost of operation cost)</i>			27 388
<i>Grand total (capital cost plus cost of operation)</i>			90 116
<i>Revenue</i>			
<i>Income during first year</i>			40 000
<i>Annual income from second year onwards before loan repayment</i>			47 000

#### 5. Composite fish and freshwater prawn farming in newly excavated tanks (Maharashtra and Orissa)

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Water area: 0.4 ha</li> <li>• Culture period: 11 months</li> <li>• Production. Fish: 800 kg in first year and 1 000 kg from second year onwards. Prawn: 150 kg in first year and 180 kg from second year onwards</li> <li>• Farm gate price: INR35 per kg of fish. INR175 per kg of prawn.</li> <li>• Repayment period of loan for capital and operational cost: five years with one year grace period.</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Land development	1	500	500
Excavation of tank	4 406 m <sup>3</sup>	23 per m <sup>3</sup>	101 338
Construction of water inlet and outlet	1	2 500	2 500
Fish farming equipment	1 set	1 000	1 000
<i>Sub-total(capital cost)</i>			105 338
<i>Cost of operation</i>			
Lime	400 kg	5.5 per kg	2 200
Cow dung	4 500 kg	0.2 per kg	900
Urea	90 kg	5 per kg	450
Single super phosphate	125 kg	4 per kg	500
Fish seed including transportation	2 000 seeds	0.6 per seed	1 200
Prawn seed including transportation	3 000 seeds	1 per seed	3 000
<i>Supplementary feed</i>			
Groundnut oil cake	470 kg	13 per kg	6 110
Rice bran	470 kg	3 per kg	1 410
Prawn feed	225 kg	26 per kg	5 850
Medicines for treatment and prevention of fish diseases	1 set	1 000	1 000

Harvesting expenses	Harvest of 1 000 kg	1 per kg	1 000
Insurance	INR21 620 as cost of operations minus medicines, harvesting expenses and miscellaneous cost	2.5% of cost of operations minus medicines, harvesting expenses and miscellaneous cost	541
Miscellaneous cost			1 000
<i>Sub-total(cost of operation)</i>			25 161
<i>Grand total (capital cost plus cost of operation)</i>			130 499
<i>Revenue</i>			
<i>Income during first year</i>			54 250
<i>Annual income from second year onwards before loan repayment</i>			66 500

### ***Small-scale shellfish and crustacean farming***

#### **6. Freshwater prawn farming in existing tanks (Orissa)**

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Culture period: six to seven months</li> <li>• Production: 306 kg in first year and 360 kg from second year onwards</li> <li>• Farm gate price: INR200 per kg of freshwater prawn</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Cleaning and repair of dyke	1	500	500
Excavation of tank	2336 m <sup>3</sup>	23	53 728
Tube well and diesel pump set	1	39 200	39 200
Pump house cum feed store	10 m <sup>2</sup>	1 000 per m <sup>2</sup>	10 000
Fish farming equipment	1 set	1 500	1 500
<i>Sub-total(capital cost)</i>			104 928
<i>Cost of operation</i>			
Lime	500 kg	5.5 per kg	2 750
Cow dung	2 000 kg	0.2 per kg	400
Single super phosphate	30 kg	4 per kg	120
Prawn seed	6 000 seeds	1 per seed	6 000
Supplementary feed	540 kg	26 per kg	14 040
Fuel		2 500	2 500
Medicines for treatment and prevention of fish diseases	1 set	1 000	1 000
Harvesting expenses	Harvest of 360 kg	2 per kg	720
Insurance	INR23 310 as cost of operations minus fuel, medicines, harvesting expenses and miscellaneous cost	2.5% of cost of operations minus medicines, harvesting expenses and miscellaneous cost	583
Miscellaneous cost			500
<i>Sub-total(cost of operation)</i>			28 613
<i>Grand total (capital cost plus cost of operation)</i>			133 541



<i>Revenue</i>			
<i>Income during first year</i>			61 200
<i>Annual income from second year onwards before loan repayment</i>			72 000

#### 7. Brackish water prawn farming (Maharashtra and Orissa)

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Water area: 0.4 ha, land area: 0.6 ha</li> <li>• Culture period: 120 days</li> <li>• Stocking density: 3 prawn seed per m<sup>2</sup></li> <li>• Survival rate: 70%</li> <li>• Number of hours of pump operation per day: 5 hrs</li> <li>• Number of days of pump operation: 100 days</li> <li>• Cost of diesel: INR100 per litre</li> <li>• Diesel consumption per hour: 1.67 litre</li> <li>• Food conversion ratio: 2.4 : 1</li> <li>• Cost of indigenous feed: INR35/kg</li> <li>• Production per crop: 250 kg</li> <li>• Farm gate price: INR300 kg</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Tank excavation	822.19 m <sup>3</sup>	1 466 per 100 m <sup>3</sup>	12 053
Diesel pump (5 hp)	1	17 000	17 000
<i>Sub-total(capital cost)</i>			29 053
<i>Cost of operation for one crop</i>			
Removal of top soil	377.61 m <sup>3</sup>	1 466 per 100 m <sup>3</sup>	5 536
Ploughing of pond bottom	0.4 ha	500 per ha	200
Initial treatment with hydrated lime	200 kg	5.5 per kg	1 100
Subsequent treatment with hydrated lime, every 3 months over a period of 15 days	120 kg	5.5 per kg	160
Semi-dried cow dung	20 kg	3 per kg	60
Single super phosphate @ 50 kg per ha	20 kg	6 per kg	120
Di-ammonium phosphate	25 kg	9 per kg	225
Seed	3 seed per m <sup>2</sup>	750 per 1000 seed	9 000
Indigenous feed	600 kg	35 per kg	21 000
Harvesting and marketing charges	For harvest of 250 kg	2 per kg	500
Diesel @ 5 hours per day for 50 days	500 litres	19 per litre	9 500
Lease of pond/land @ INR835/ha/year	0.6 ha	835 per ha	501
Crop insurance			1180
Insurance of physical structures @ 0.5% per annum on physical structures	Rounded value of capital investment in physical structures: INR29 100	0.5%	146
Maintenance			961

<i>Sub-total(cost of operation)</i>			50 189
<i>Grand total (capital cost plus cost of operation)</i>			79 242
<i>Revenue</i>			
<i>Income after 120 day culture period</i>			75 000

#### 8. Mussel raft culture (Maharashtra)

<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Oil drums	4	750	3 000
Anchors of 50 kg weight	4	35 per kg	7 000
<i>Sub-total(capital cost)</i>			10 000
<i>Operational Cost</i>			
Mangrove wood logs (5–6 m long and 10–15 cm wide)	12	25 per log	300
Nylon rope (600 m long and 24 mm thick)	1	5 per m	3 000
Used purse seine net (500 m)	1	2 per meter	1 000
Mussel seed (500 kg)	1	10 per kg	5 000
Maintenance and repair			6 000
Miscellaneous			1 000
<i>Sub-total(cost of operation)</i>			16 300
<i>Grand total (capital cost plus cost of operation)</i>			26 300
<i>Revenue</i>			
<i>Income from sale of 5 000 kg of mussels</i>		10 per kg	50 000
<i>Gross profit</i>			33 700

#### 9. Artemia culture (Maharashtra)

<i>Item of capital/operational expenditure and income</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>	
Lease of 1 ha of land	10 000
Raising of dyke to 1.5 m	15 000
5 hp diesel pump with accessories	15 000
<i>Sub-total(capital cost)</i>	40 000
<i>Cost of operation for 1 crop after 5 months</i>	
Cysts for inoculation	500
Fertilizers	4 200
Electricity and diesel	2 000
Maintenance	5 000
Labour	3 000
Packing charges	300
<i>Sub-total</i>	15 000
<i>Cost of operation for two crops in one year</i>	30 000
<i>Revenue/sale proceeds</i>	
<i>Sale of 60 kg of cysts from 2 crops @ INR1 250 per kg</i>	75 000
<i>Sale of 400 kg of biomass from 2 crops @ INR40 per kg</i>	16 000
<i>Total revenue/sale proceeds</i>	91 000
<i>Gross profit</i>	61 000

## 10. Mud crab culture (Maharashtra)

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Pond size: 0.1 ha</li> <li>• Culture period: 20 days</li> <li>• Stocking density: 1 crab per m<sup>2</sup></li> <li>• Survival rate: 80%</li> <li>• Production: 320 kg/0.1 ha/crop</li> <li>• Weight at harvest: 400 g</li> <li>• Crops per year. First year: 4, second year 8.</li> <li>• Farm gate price: INR150 per kg of crab</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost</i>			
Construction of pond of 800 m <sup>3</sup> , including soil excavation, compacting, consolidation and dyke construction	1	25 per m <sup>3</sup>	20 000
Construction of water inlet and outlet sluice gates	2	5 000	10 000
5 hp diesel pump set	1	18 000	18 000
Bamboo poles for fence construction			3 000
Nylon nets for fence construction			2 000
Casurina poles	250	15	3 750
Construction of guard shed			5 000
Miscellaneous expenditure			2 000
<i>Sub-total(capital cost)</i>			63 750
<i>Cost of operation</i>			
Pond preparation			600
Cost of 1 000 soft shell crabs of 350 g each	350 kg	80 per kg	28 000
Feed at a ratio of 35 kg/day	700 kg	10 per kg	7 000
Cost of diesel			500
Labour charges @ INR100/day			2 000
Harvesting expenses	Harvest of 350 kg	1 per kg	350
<i>Sub-total(cost of operation)</i>			38 450
<i>Grand total (capital cost plus cost of operation)</i>			102 200
<i>Revenue</i>			
<i>Income per crop</i>			48 000
<i>Annual income from first year of operation (4 crops)</i>			192 000
<i>Annual income from second year of operation (8 crops)</i>			384 000

**Small-scale fish processing****11. Small-scale fish drying plant (Maharashtra and Orissa)**

<i>Assumptions</i>	<ul style="list-style-type: none"> <li>• Number of days of operation per year: 150</li> <li>• Quantity of fresh fish (sciaenids) used per day: 1 000 kg</li> <li>• Dried fish yield from fresh fish: 30%</li> <li>• Production per day: 300 kg</li> <li>• Sale price per kg of dried fish: INR65</li> </ul>		
<i>Item of capital/operational expenditure and income</i>	<i>Number of units</i>	<i>Rate per unit (in INR)</i>	<i>Total cost/income (in INR)</i>
<i>Capital cost, civil works</i>			
Civil works in 360 ft <sup>2</sup> plant area	360 ft <sup>2</sup>	350	126 000
Storage shed	450 ft <sup>2</sup>	350	157 500
Overhead tank (500 litres)			25 000
Shallow tube well			18 000
Pump set			11 900
<i>Sub-total civil works</i>			338 400
<i>Capital cost, equipment</i>			
Curing tanks (FRP)	6	7 000	42 000
Stainless steel table tops	2	3 000	6 000
Weighing balance	1		5 000
Knives, drying trays etc.	1		10 000
Heat sealer	1		10 000
<i>Sub-total (capital cost, equipment)</i>			73 000
<i>Sub-total(capital cost)</i>			411 400
<i>Cost of operation for 150 days of operation</i>			
Fresh fish @ 1 000 kg per day for 150 days	150 000 kg	10	1 500 000
Salt @ 400 kg per day	60 000 kg	3	180 000
Polyethylene packs @ 1 800 per day	270 000	2	540 000
Master cartoons @ 30 nos. per day	4 500	20	90 000
Water and electricity			15 000
Skilled labour (2)			20 160
Insurance @ 3.5% of capital cost			14 399
Maintenance and repair at 10% of capital cost			41 140
Marketing expenses at 3% of sale proceeds			87 750
Miscellaneous cost @ 2 % of sale proceeds			58 500
<i>Sub-total(cost of operation)</i>			2 546 949
<i>Revenue</i>			
<i>Annual Income @ 100 percent capacity utilization</i>			2 925 000



**Members of the MAA Gangadevi Primary Marine Fisherwomen Fish Marketing Co-operative Society, Ltd.**



**Members of self-help groups assisted by the M.S. Swaminathan Foundation engaged in fish and vegetable farming, with the fishpond in the background**





**Middlemen negotiating with fisherwomen**





**Catch composition from landing center**

ISBN 978-92-5-105745-2 ISSN 0429-9329



9 789251 057452

TR/D/A1164E/1/06.07/450