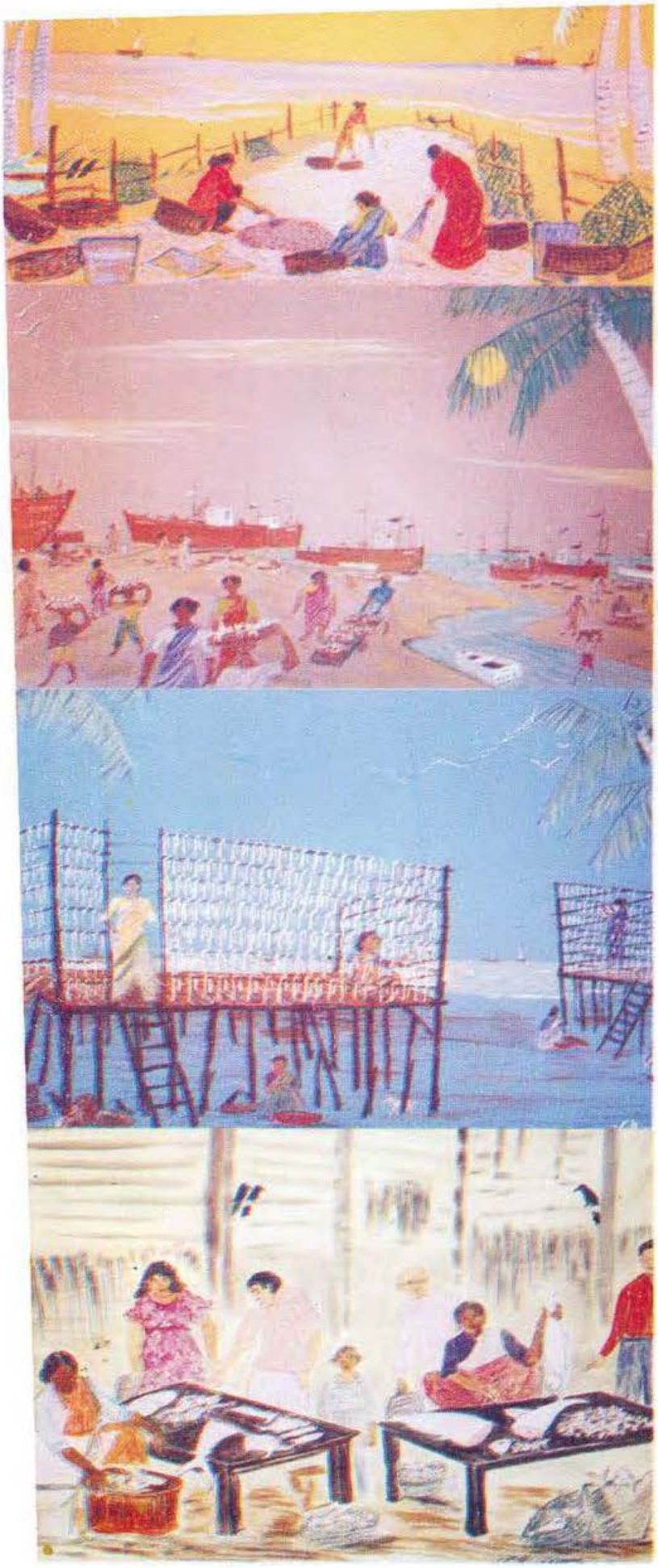
Women in Fisheries

Dr. M. P. Singh Kohli
Dr. Ms. Ratna Tewari

Indian Society of Fisheries Professionals



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Four Bungalow's Fish Market, Mumbai by Night
Courtesy : Dr. M. P. S. Kohli

With compliments Dr. Nandeshe

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WOMEN IN FISHERIES

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Photographs

Cover page front: Courtesy Dr. M. P. Singh Kohli, CIFE, Mumbai. The photograph was adjudged as III rd best entry & received prize of US $ 200 at Asian Fisheries Forum held at Chiang Mai, Thailand during 1998. Women fishers operating Chinese type dip net in low-lying flood plains of Assam. This photograph was also displayed on the home page of ICLARM website.

Cover page back: Courtesy Dr. Ms. Krishna Srinath, CIFT, Cochin. A Khasi woman retailing dry fish in Meghalaya.

The material published in this book is based on the papers presented at **International Conference on Women in Fisheries** held at Mumbai on 11-12 December 2001 organised by Indian Society of Fisheries Professionals. Few of the papers received but not presented at the conference have also been included. The views expressed in the articles are the academic views of respective authors. The work can be quoted by citing reference and acknowledgements.

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Dr. Panjab Singh
Secretary, D.A.R.E. & D.G., I.C.A.R.

FOREWORD

Indian agriculture sector recognises the contribution of women in green revolution. Fisheries is fast emerging as an important sector of Indian economy contributing more than US $ 1.4 billion in the fish export trade annually. There is scope for enhancing fish production from rich and varied aquatic resources of our country. More than eighty percent of labour force in fish processing plants and retail marketing in India are women. To highlight gender equality and empowerment, Government of India had announced year 2001 as "Women's Empowerment year".

I am glad to know that Indian Society of Fisheries Professionals had organised **"International Conference on Women in Fisheries"** on 11th and 12th December 2001 at Central Institute of Fisheries Education, Mumbai and consequently they are bringing out a book based on papers presented at the conference. We need more information on the role of women played in Fisheries Sector. I hope the proceedings of the conference called "Women in Fisheries" will serve as a good reference book for researchers, planners, NGOs and Agricultural Institution's Libraries.

(Panjab Singh)
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&
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February 15, 2002

Dr. S.A.H. Abidi
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FOREWORD

I am very happy to note that Indian Society of Fisheries Professionals had organized an International Conference on Women in Fisheries from 11-12 December, 2001 at Central Institute of Fisheries Education, (Deemed University) Mumbai with the objective to highlight the role being played by women in the various development in the fisheries sector.

It is beyond doubt that women have played great role in building the culture and society since the inception of the civilization . Women's role have been very significant in our country as a leader, scientist, parliamentarian, business executive, educationist, engineer, administrator, pilot and mananger. In this country the agriculture would have not progressed in its totality but for the support of the women in the villages and so the fisheries sector is not an exception.

I understand that in the above detailed symposium 38 papers were presented and now the Indian Society of Fisheries Professionals are making a good contribution by bringing out a publication entitled," Women in Fisheries" edited by Dr. M.P. Singh Kohli and Dr. Mrs. Ratna Tewari. It will go long way to put together such contribution in one publication for future reference and also help to the researchers and planners in organizing and seeing the role of the women in India.

I appreciate and wish all the good luck for the efforts and initiative taken by Prof. M.P.Singh Kohli, Promoter of the Indian Society of Fisheries Professional in holding such an important Symposium.

Yours sincerely,

(S.A.H. Abidi)

P. K. Pattanaik
Joint Secretary

JOINT SECRETARY
Government of India
Ministry of Agriculture
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19 February 2002

FOREWORD

It gives me immense pleasure to know that Indian Society of Fisheries Professionals, Mumbai is publishing the proceedings of the International Conference on Women in Fisheries held on 11-12 December, 2001 at CIFE, Mumbai. The fisheries sector has been playing important role in Indian economy through generation of income and employment opportunities and enhanced foreign exchange earnings. Women play an important role in fisheries development in the country. The various measures initiated for the development of fisheries have brought commendable results and India is now placed at the third position in fish production in the world and second in the production of inland fish. Women's contribution in this achievement is formidable and needs sincere recognition.

This conference, by highlighting the role being played by women in the development of fisheries sector, has served the requirement of all the sections involved in fisheries development by providing insight into the role played by women in fisheries sector and the intricacies of their problems. I hope that this publication will serve as a useful guide for planners, researchers, NGOs and fisheries managers engaged in the task of enhancing the fish production in the country.

P.Pattanaik 19/2/02

(P.K. Pattanaik)

Dr. K. Gopakumar
Dy. Director General (Fisheries)

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

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FOREWORD

I am glad to know that Indian Society of Fisheries Professionals, Mumbai is going to bring out the volume **"Women in Fisheries"** based on the papers presented at *First International Conference on Women in Fisheries* held on 11 -12 December, 2001 at Mumbai. Women play a very important role in fisheries. In the marine sector they represent the largest work force in terms of number, engaged in fish vending, net making and processing. In the farming sector they contribute immensely in the production of seed and management of growing systems in the field. Fisheries sector provide food security and employment opportunity for women. However, there are number of issues faced by fisher women which remain un-addressed due to various social and economical considerations. Their work and contribution to national economy also remains unaccounted, being a weaker section of the society. Hence, organization of this conference, aimed at bringing to the front challenges, opportunities and issues of fisher-women, was a commendable venture.

I hope the volume will become a valuable document in this area for organization of future programmes for the support for women entrepreneurship in the country.

[K. Gopakumar]

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FOREWORD

Fisheries has been a part of the civilization, particularly of importance to maritime States like India, for times immemorial. Fish has immensely contributed to the economic growth of the country as well as nutritional security of millions of households. Women have been participating in different sectors of fisheries and aquaculture, whether it is breeding the fish, catching the fish, marketing the fish or processing the fish for consumption. Their contributions have been such that some areas are exclusively managed by them. Recent past has seen women also as entrepreneurs and managers in the sector.

The present document on "Women in Fisheries" provides the necessary focus on the contributions and potentials of women in fisheries sector, acknowledging their role as well as elucidating the need for greater support in terms of policy issues. I compliment to ISFP and the Editors as well as the authors for a volume that would be unique in the fisheries literature.

S. Ayyappan

Mumbai 22nd February, 2002

PREFACE

Women contribute a major workforce and should be considered equal partners in growth and development of the world, but it is not so especially in developing and underdeveloped countries. Various global fora like United Nations have highlighted the role women play, in world development emphasising gender equality, empowerment, social justice etc. The Declaration of the UN Decade for Women in 1975 saw the launching of several initiatives to raise the profile of the age- old social, cultural and economic barriers that were the stumbling blocks in preventing women from being active agents and beneficiary of development.

Women in Agriculture (WIA), Women in Fisheries (WIF) were the offshoots of Women in Development (WID) focussing on the gender issues related to specific areas. Several worksops have been conducted world over emphasising the role of women and children in fisheries. The World Fisheries Conference in Rome in 1984 stressed the vital contribution that women make in fisheries directly and indirectly. A number of initiatives have been taken in China, Thailand, Combodia, Vietnam, LAO, PDR, Philippines, India and Bangladesh to understand the problems faced by women fishers and intervention needed for their betterment. Asian Fisheries Society devoted a session on women in fisheries at its Chiang Mai Forum in 1998 and again a whole day global symposium on women in fisheries in November 2001 at Taiwan Forum to focus attention on contributions of women in fisheries development and various gender related issues.

Fisheries and aquaculture are important components of economy of many Asian countries and women are involved actively specially in post-harvest

And fish marketing besides attending to various household duties. There is a great dearth of scientific information on gender related issues in fisheries globally hence Indian Society of Fisheries Professionals decided to organise this International Conference on Women in Fisheries. Papers were received from Bangladesh, Indonesia, Nepal, Sri Lanka and India. Out of 56 papers received, 38 papers were presented in the conference out of which 23 papers are presented in this book after duly editing. We hope that this book will serve as a useful reference for researchers, developmental agencies and NGOs.

Following recommendation were made at the conclusion of the conference:

- Documenting work carried out in India and abroad in the area of women in fisheries.
- Encouraging formation of fisher-women self-help groups and organizing credit facilities through governmental funding agencies.
- Training of self-help groups in fisheries technologies and entrepreneurship development by Fisheries Institutions.
- Networking of National an International linkage among scientists and NGOs working in this area.
- Formulating and implementing welfare schemes for women fisheries and fish workers by State and Central Government Agencies.
- Under taking at least one research project on techno- socio- economic aspects related to women fisher by various Fisheries Institutions. Encouraging formation of all women's fisheries co-operative societies supported by Fisheries Institution/Departments; leasing of water bodies to fisherwomen should also be encouraged.

We acknowledge with gratitude the financial assistance received from various agencies for successfully conducting the conference. We are also grateful to Director and staff of Central Institute of Fisheries Education, Mumbai and Mumbai based life members of Indian Society of Fisheries Professionals for their whole hearted support for organising the conference at the Institute. **We dedicate this book to women fishers of the world.**

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Dated 22.02.2002 **Editors**

Women at the Centre Stage for Socio-Economic Change in Fishing Community

*P.V. Dehadrai**

Introduction

Despite the increasing evidence of the vital role played by women in food related activities throughout the world, the role of women in planning for rural development is marginal. According to a UN estimate, women account for over half the food produced in developing countries. According to a recent Human Development Report of UNDP, 70% of the people living in abject poverty are women. The increased concentration of poverty among rural women can be attributed to their access and to control over productive resources especially land, water, labour inputs, technology and services viz. extension, training credit and markets besides limited participation in decision making process. Fishers in India still remain as the poorest of the poor and continue to occupy lower rung in the social strata. This affects the status of women in the country the most.

Poverty has a gender bias. In most of the regions of the world, women are poorer than men. This is because women face a whole series of complex cultural, social, traditional, economic and legal constraints that even poor men do not face. They have far less opportunities than men to get education and training and therefore possess very few skills necessary for today's world. There appears to be a definite feminization of poverty. When a community as a whole is poor and downtrodden, the womenfolk in the community have to bear the brunt of it all the more.

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Our attempts at training women on skill and knowledge that are just an extension of domestic activities of farm-based activities, are neither going to empower them nor improve their quality of life. Therefore, a holistic approach to enlarge the horizon of the exposure to women beyond the sympathy oriented training programs will have to be provided. Modern technology and informatics should also be placed at their disposal. Women need to be given training in professional skill and knowledge.

Women and sustainable development

The close relationship between women and sustainable development is being increasingly recognized. Human activity is by definition a holistic activity and should take into account women's experience and knowledge, if sustainable development is to be achieved.

Most of the problems ailing village women are related to agriculture, pastoral and social forest ecosystems. But presently, non of the above ecosystem furnished enough biomass to meet day to day and highly varied needs of the family such as fuel, fodder, fruits, medicinal herbs, thatching and construction materials, fish, vegetables etc. nor opportunities of work for the year. The women are mostly dependent on the other gender for the means of production and thus the relationship between dependence and exploitation is directly proportional. Therefore, to bring about a comprehensive change in quality of life of rural women appropriate programs need to be launched.

The women have remained as 'invisible farmers' despite being major producers of food in terms of value, volume and hours worked in agriculture and allied activities. Besides agriculture, women have major share of work in dairy, fruit, vegetable, fish marketing and animal husbandry. However, women are proving to be admirably suited to all new activities related to fisheries beyond their role in fish marketing and management.

Nobel Laureate Amartya Sen emphasized on the necessity to take an agent-oriented approach to the women's agenda. Such an agenda must transcend the view of women as patient solicitors of social equity and see them as potentially active agents of major social change. Making women agents of social change will not only remove the iniquities that depress their own well being but also impact the well being of men and children. Expanding female participation rates in labour force could bring about a sea change in the process of improvement of social structure, as witnessed in China.

It is necessary to bring about the gender integration indeed.

Greater attention needs to be paid to the relationship between women and water resource management activities such as irrigation, fisheries, water problems and habitat protection. Lack of gender sensitive planning in water resource management can have various negative effects on women, their families and the community.

Women in fisheries

In India, even though the women are not involved in active fishing in marine fisheries, they contribute substantially in the pre and post-harvest operations. About 25% of the labour force in pre-harvest activities, 60% in export marketing and 40% in internal marketing are women. Although about 0.5 million women are employed in the pre and post-harvest operations in marine fisheries sector, out of a total 1.2 million workforce. The working conditions are poor and the wage rates received by the women are comparatively low.

Opportunities for women in fisheries could be enlarged in the field of integrated aquaculture, fishery estates, marine product development, management of fishery infrastructure, marketing and export as well as in research and technologies development.

Fish farming

For women, projects with special emphasis on fisheries could be started to develop their skills, knowledge, habits and attitude towards adoption of new and economically viable technologies.

Experiences in Orissa have been rewarding. Fish farming could be initiated to demonstrate practical feasibility and the range of benefits in terms of economic gains, labour efficiency, self - employment opportunities and multiple choice of vocations that aquaculture could offer to rural women. Experience justifies aquaculture as an appropriate technology for the rural women being compatible with their physical capacity and general aptitude. It is easy to adopt and highly rewarding in economic terms. There is marginal need for investment capital and diminutive demand on the labour time. Aquaculture activities can be pursued by the rural women folk at convenient leisure time without being a detriment to their routine. Small backyard ponds of 0.01 ha can serve as a resource base to generate a steady income throughout the year. The use of pond embankment for seasonal horticulture crops could provide a successful integration for optimum productivity per unit area. This removes the rigid compartmentalization and typified work-structure for womenfolk giving a more multi-skilled type of job opening and adequate compensation to womenfolk.

The backyard ponds could be of immense use for taking sizeable crops of fry, fingerling and even table size fish in succession, providing self-employment to rural women. The women's contribution in these ventures would be like an ancillary industry with guaranteed returns from their backyard ponds.

Integration of aquaculture with paddy

In agriculture sector, the paddy plantation and harvesting is predominantly done by women labour. Integrating fish culture with paddy can provide additional income without disturbing the paddy cultivation protocol. Women are

known to adopt the integrated technology as there are several success stories from Manipur, Tripura, Orissa and West Bengal. Thus, there is need to encourage this trend and support them with viable programs and funding.

Women's role in shrimp farming

Shrimp farming requires minimal skill levels and creates value added employment opportunities. Women are involved in the collection of juveniles by the simple hand picking technique in estuaries and backwaters during high tide. This work is seasonal and is traditionally carried out by women who can identify different species of shrimp by their morphology. They transport the juveniles from the natural water bodies to the nearby private farms in polythene bags. The women engaged in the collection of juveniles are often illiterate. With a little on the spot training their efficiency can be improved.

Women are employed in carrying out manual work of raising the bunds for ponds. They are paid less for their labour and are exploited. Women should be exposed to the techniques of manual and mechanical pond construction.

Fish / prawn feed manufacture

The technology of preparation and production of balanced fish/ prawn feed by utilizing the locally available raw material from organic waste and other non - conventional resources of villages and transferring the technology to poor rural women.

The experience of such a venture was again rewarding in Kerala when Department of Science and Technology (DST) project was implemented with the help of Central Institute of Fisheries Technology (CIFT) in Kochi. After association with the project women expressed their confidence in preparing the feeds and sell those. The quality of feed prepared by the women was in no way inferior to that produced in the factories in India or even those imported. The

venture could be enlarged through all women cooperative societies and by better marketing strategies.

Aquaculture estates and cooperatives

All-women aquaculture estates and all-women fisheries cooperative societies could prove to be viable programs in the sector.

By linking land allotment with credit, technology, techno-infrastructure, training and trade such all women's organizations could become powerful instruments in improving livelihood security of the rural poor.

Women are noticeably absent in extension activities. Women extension agents respond to the needs of women producers and can create an awareness of the vast possibilities for women.

Post-harvest activities

Women have proved to be suited for post-harvest technologies, which include sorting, icing, packaging and preservation. Further processes of adequate analyses of consumer taste, availability and costs of raw material, price of the final products, storage facility assessments, quality control and marketability need to be extended to women.

Dissemination of scientific knowledge and conducing training on various post-harvest technologies for better utilization of fish to provide self/cooperative employment opportunities to poor coastal women could be a result oriented program. It would provide nutritionally rich diversified products both for domestic and export marketing.

Under the DST project conducted in Kerala, the dressed and diversified fish products made by women showed the quality, taste, culinary properties and shelf life resulting in consumer taste satisfaction. By filleting and mincing process, the low cost fish get acceptance by the elite public in the form of

nutritious, value added products, in turn benefit the coastal people. In fact, such projects have global applicability.

Aqua business consortia

It is necessary to frame feasible models of aqua industry for different agro - ecological regions. Concept of agro-business consortia breaks new grounds. From among several agricultural commodities and their by-products, fish from aquaculture is one formidable commodity. Consortia with cluster approach to cater to the nearby production centers with environment friendly technologies and abundant raw material available for processing, value addition, packaging and marketing. This would provide socio-economic stability.

To support the consortia, strategic Fishery Estate could also be linked to ensure supply of raw material. In marketing, women should be trained for the techniques for negotiation and bargaining to get over their inherent shyness. Women could become efficient technicians and managers for food product development regular monitoring, harvest and post-harvest treatment jobs.

The consortia could be multi dimensional with activities related to net making and repairs as well.

Women in Coastal and Fisheries Resources Management

*Krishna Srinath**

Introduction

Sustainable development is an overriding strategic issue and a challenge in coastal and fisheries resource management. Issues of sustainability demand new ways of management so that a balance between food security and environmental resources can be attained. In the context of eco - labeling, in future production of fish and other coastal based commodities; acceptable sustainability credentials will probably be as essential as quality and safety standards. The World Resources Institute in 1996 reported that about 35 % of the world's coasts are at high potential risk of degradation and another 17 % are at moderate risk. As an estimated 90 % of the world's capture fisheries production is dependent on coastal habitats, the relevance of fisheries is obvious. Moreover, the coastal fishing communities are typically characterised by intense competition for scarce resources, which is often associated with unregulated access to these resources. The known consequences of habitat damages include loss or lowering of productivity and associated threat to local food security, contaminated aquatic food products, reduced economic viability, increased levels of conflict involving fishers, physical displacement of communities, increased unemployment and loss of trade opportunities (FAO, 1999).

Human beings as the major component and as the user of the coastal and fisheries resources have heavy interactions with the precious natural system and have very critical role in their protection and sustainable management. According to the FAO (2001) millions of people migrate to seaboard cities and the

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population of world's coastal zone is expected to double within the next 20 - 30 years. More than half of the coastal zones in many regions is already at moderately to high risk. In India, due to human interference, lakes, marshes, river systems and other wet lands are degraded and some wet-lands, including backwaters of Cochin are seriously threatened (Devaraj *et al.*, 1999; Kumar and Asija, 2000). Figures recently released by FAO on number of people in fishing and fish farming worldwide has more than doubled since 1970. Most of the growth has taken place in 1980 and mainly in Asian countries where 4/5th of the fishers and fish farmers dwell.

There are very good examples from different parts of the world on successfully involving women in the management of natural resources. In Chile women's interest in protecting the resources, respecting the closed season and getting better prices demonstrated their appreciation of the problem arising from over exploitation of resources (Alwarez, 2001). The shell fish revolution caused by large-scale changes in Spain's infrastructure development and inclusion in the European Community enabled women in shell fish industry to earn high independent income and motivated them to take a politically active role to protect and manage shell fish resources (Meltzoff and Board, 1996). Similar instances can be cited in forestry, where community based management (CBM) involving women was followed. Women have greater potential to tackle food security and sustainability (Erftemeijer and Ratanadukul, 1998; Gabdegesign, 1996; Meynert, 1996; Panda, 2000).

The coastal rural population depends on coastal resources for food, fodder and fuel in many ways. It is estimated that in India about six million people are directly engaged in marine fisheries and their families live in the coastal areas. Women forming fifty per cent of the total population and can play a very important role in the sustainable development of coastal resources in the context of the implementation of coastal zone regulations (CRZ). It is important to

discus the possible role of women in handling and management of these resources, their understanding of the reasons for environmental degradation and laws and regulations pertaining to use of coastal resources and gender issues involved in sustainable development.

A study was conducted in Ernakulam and Allepy Districts of Kerala in the west-coast and Kanyakumari in Tamil Nadu in the east-coast. The methodology included personal interview, personal observations, group discussions and case studies. Information was also collected from secondary sources including the records of local administration and fish processing units.

Women in fisheries

Fisheries is the most important resource for communities inhabiting the coasts as it forms their major livelihood. Besides attending routine family chores, coastal women also support the fisheries sector through their involvement in small- scale fisheries operations such as net making, fish culture, fish pre-processing, processing and marketing. The nature of contribution varies with the geographical area, resource availability, type of technology, infrastructure, access to processing facilities, marketing pattern, rural-urban settings and social factors. Women's role in coastal resource management become more pronounced with the increasing number of female-headed households (Krishna Srinath, 1993).

Women in fish processing

Socio-economic condition of the pre-processing and processing workers is given in Table 1. A total of about 0.4 million women are estimated to be engaged in fish pre-processing and processing work in India. Women are employed as workers in peeling sheds for pre-processing of shrimps, squids and cuttlefish and as workers, technicians and supervisors in processing units for cleaning, grading, processing, quality control and packing. In the processing factories they also

Housing

At the community level housing is a major factor, which leads to growing competition for space. Vypeen Island where Elamkunnapuzha is situated was formed as a result of the floods in the year 1341. With the increase in family size the plots of land are further divided to build houses. About 25 % of the houses are thatched.

Pollution due to aquaculture and industrial development

New methods of aquaculture and development of industrial activities in the district are said to be the major causes for coastal zone degradation. Pollutants from the industry lead to diseases of humans and other fauna of the coastal zone.

Disposal of non degradable waste

Plastic has invaded the lives of people everywhere. One of the major reasons for environmental degradation of the coast is water-logging due to clogging of canals by non-degradable materials like plastic. There is no effective mechanism of disposing it. The smoke from burning of certain materials cause health problems. Women in Elamkunnapuzha and Chellanam have a great concern for this. Though the local Panchayats had formulated plans for waste disposal and cleaning of canals but the implementation was not very effective.

Disposal of human waste

Non- availability of clean water required for sanitation and water logging poses problems in the disposal of human waste, which is thus an impediment to sanitation. People continue to use open space and canals for excretion. Only about 10 % of the households have sanitary latrines. Gender related problems are very grave in this regard.

handled finfish and crabs. In the centres selected in Kerala all the women workers are from the nearby localities and in Tamil Nadu women from Kerala are also employed in pre- processing and processing work. Women from Kerala are employed in large numbers for this work in other maritime states also as they exhibit better skill in the work. They do not usually migrate by choice, but economic compulsions force them to migrate, once married they settle down as homemakers. Back home they continue the work if available nearer home. Women with small children do not like working in the night shifts.

In activities such as net making and marketing, women are being marginalised due to increasing mechanisation, commercialisation and centralisation of fish landings.

Table 1. Socio-economic variables of women workers in pre-processing and processing units

SE variable	Pre- processing		Processing	
State	Kerala	Tamil Nadu	Kerala	Tamil Nadu
Average age	30	25	29	20
Married women (%)	50	30	35	27
Education*	>HS	>M S	>H.S	>M S
Family size	4-5	5-6	4-5	5-6
No of days employed/year	280	220	300	320
Quantity processed/day Shrimp/squid&CF (kg)	30 , 65	25 , 65		-
Annual income (Rs)	15,000	13,500	19,500	15,000

*H.S.- High school; M.S. Middle school

Women in management of land-based coastal resources

The common property resources are shared by individuals, community, government and private institutions. Even though desegregated information for fisherfolk is not available the population figures in Kerala indicate a greater number of females in both the villages under study.

The literacy rate for male and female for the District was approximately 96 % for males and 91 % for females against the Kerala state average of 94 % and 88 % for males and females respectively indicating much scope for improvement in the selected villages. Dominating caste in Elamkunnapuzha is Dheevara and in Chellanam Latin Catholics constitute a majority. Regarding ownership of assets, only about 2,000 non - mechanised crafts are operated by 10,000 fishermen in Elamkunnapuzha and a same number for 16,000 fishermen in Chellanam. The marine and backwater fisheries are carried only by men and women of certain communities in the shallow impounded waters and in the shorewater. About 15% of aquaculture fields in Elamkunnapuzha and about 3 % in Chellanam were owned by women (Govt. of Kerala, 2001).

Major uses of coastal resources by villagers

The coastal state of Kerala supports about 0.64 million fisherfolk. There are 41 west flowing rivers, which discharge into 30 estuaries opening into the sea through perennial and seasonal outlets across the bar mouths. The estuaries and backwaters, which once occupied an area of 2,426 km^2, have now shrunken to 652 km^2 because of reclamation for agriculture and human settlement. (Devaraj *et al.*, 1999). Major uses of coastal resources in Elamkunnapuzha and Chellanam are similar and as identified by women living there, are indicated in Table 2.

Table 2. Major uses of coastal resources in Elamkunnapuzha and Chellanam

Elamkunnapuzha	Chellanam
♦ Food (fish, paddy, coconut, Vegetables, animals, birds)	♦ Feed & fodder(grass, hey, grains, Leaves, worms)
♦ Fishing for livelihood	♦ Fuel (mangroves, trees)
♦ Aquaculture, agriculture	♦ Water (cooking, bathing, washing, transport,aquaculture, agriculture)
♦ Housing (land, sand & gravel, timber, mangrove)	♦ Transport
♦ Schooling	♦ Waste disposal
♦ Industry	♦ Recreation ,Religion

Causes for deterioration of coastal resources

The natural causes of deterioration of coastal zone, as understood by the respondents, include subsidence, drought, storm, erosion and sea level variation. Coastal zone is a highly dynamic system and is subjected to increasing populations and economic pressures manifested by a variety of coastal activities. Damages caused due to human interference, according to the respondents are given in Table 3.

Table 3. Causes of deterioration of coastal resources according to the respondents

Nature of interference	Causes	Effect
Coastal development including habitat modification	Destruction, alteration and construction	Decline of coastal zone, common property resources and growing competition for space
Aquaculture	Increased investment and faulty use of technology	Higher financial risk, adversity on soil and water quality and imbalances in land use pattern
Industrialisation	Release of toxins and pathogens	Ill- effects on human and fisheries resources
Tourism	Inflow of external population	Pressure on coastal resources and restricted mobility for women

Women's awareness of coastal zone issues

Four important issues of coastal resource regulation were presented to women individually and in groups, their awareness and understanding were rated on a three- point scale. The responses are presented in Table 4.

Table 4. Women's understanding coastal zone issues

Issues	Awareness	Understanding
Pollution	High	Moderate
Ban on monsoon trawling	High	Moderate
Mangroves	Moderate	Low
Coastal Zone Regulation(CRZ)	Moderate	Moderate

Housing

At the community level housing is a major factor, which leads to growing competition for space. Vypeen Island where Elamkunnapuzha is situated was formed as a result of the floods in the year 1341. With the increase in family size the plots of land are further divided to build houses. About 25 % of the houses are thatched.

Pollution due to aquaculture and industrial development

New methods of aquaculture and development of industrial activities in the district are said to be the major causes for coastal zone degradation. Pollutants from the industry lead to diseases of humans and other fauna of the coastal zone.

Disposal of non degradable waste

Plastic has invaded the lives of people everywhere. One of the major reasons for environmental degradation of the coast is water-logging due to clogging of canals by non-degradable materials like plastic. There is no effective mechanism of disposing it. The smoke from burning of certain materials cause health problems. Women in Elamkunnapuzha and Chellanam have a great concern for this. Though the local Panchayats had formulated plans for waste disposal and cleaning of canals but the implementation was not very effective.

Disposal of human waste

Non- availability of clean water required for sanitation and water logging poses problems in the disposal of human waste, which is thus an impediment to sanitation. People continue to use open space and canals for excretion. Only about 10 % of the households have sanitary latrines. Gender related problems are very grave in this regard.

Drinking water scarcity

Due to improper management of centralised water supply at the corporation and district levels the coastal villages have been worst hit by drinking water scarcity for more than last 10 years now. Collection of potable water from water tankers and from far away wells is the greatest drudgery women have to undergo in their day-to-day lives. They spend sleepless nights to fetch water. It is difficult to get enough water even for washing and bathing.

Tourism

Women are anxious about the growing tourism in the villages. They are worried that the inflow of outsiders may interfere with their normal life and lead to conflict over the use of resources.

Mangrove

Mangroves are very valuable to the coastal people as they not only provide shade and shelter but also used for building construction work and as fuel. Thick mangrove vegetation in Elamkunnapúzha and Chellanam have been destroyed for housing and developmental purposes, leaving only 5 ha of mangrove. *Rizhophora* and *Candalia* dominated Elamkunnapuzha and *Avicenia* and *Acanthus* are the major species in Chellanam. Women are aware of the importance of mangroves and the action taken by local NGOs in mangrove rehabilitation.

Ban on monsoon trawling

Women in the traditional fisher households operating motorised and non-motorised canoes consider ban on monsoon trawling as a boon as it helped in increased earnings. They are aware of the damages caused to the fishery resources by the trawl nets. They also feel that fishing has become capital intensive for artisanal fishermen as the fish catch by them has come down and

group ventures like ring-seine operation are becoming uneconomical.

Coastal zone regulation

Upgradation and protection of coastal resources is considered to be very important by the women. However they opine that construction of houses by local fishermen should be exempted from restrictions of CRZ regulation, as it is difficult to find alternative housing sites in the village. The coastal strips are becoming narrower due to subsidence and the women in Chellanam reported that the sea which was 2-3 km from their village now it had reached their doorsteps. Flood occurs three times a year causing severe damage to the houses and other assets. Women assume major responsibility in managing the situation and their possessions (Krishna Srinath and Balasubramaniam, 1997). They are told to lay sand filled sacs along the shore to check water inflow, removing sand from one area to fill another leads to more problems. In certain locations as in Puthuvaippu government has taken steps to rehabilitate people residing in highly erosion prone areas. The Ernakulam district is well laid with walls along the sea but over the years these walls have lowered by about one meter.

Women's priorities in coastal zone management

The following are the priorities of women of Elamkunnapuzha and Chellanam in the context of coastal zone management:

- Improvement of drinking water supply
- Finalisation of coastal zone regulation policy for Kerala which is pending with the government
- Disposal of non degradable waste

They are willing to cooperate and work for the improvement of coastal zone provided they are given guidance and financial support.

Conclusion

A complex set of environmental, economic and social issues underlie the future of coastal zone. According to the FAO, unless governments and the users of coastal resources take appropriate action, population pressure and associated levels of economic activities will further increase the already evident exploitation of coastal resources and environment degradation of many coastal habitats. An understanding of a specific coastal zone is incomplete without a clear understanding of differences and inequalities between and among women and men- their priorities, activities, resources and access to decision making. There is a marked gender division of labour in agriculture, aquaculture, fisheries, forestry and tourism and other economic activities in the coastal areas (Woroniuk and Schalkwyk, 1998). Enhancement methods include fisheries management, habitat conservation, juvenile protection, strengthening of fisheries institutions and prevention of poaching (FAO, 2001). Environmental activism drives emphasis on natural resources management away.

Women of Kerala are conscious of sanitation and cleanliness and are sensitive to the requirements of personal hygiene and clean surroundings. This consciousness and higher rate of literacy can be taken advantage of. Traditional wisdom in coastal resources management should be used in micro-level interventions. There is considerable bias in extension coverage. Women are said to be by-passed by extension. Environmental issues are yet to gain importance in extension agenda.

References

Alwarez, J. A., 2001. Women in fisheries, gender agenda, Samudra, 29: 42-44.

Devaraj, M., N. G. Menon, V. K. Pillai and K. Balachandran, 1999. Coastal zone governance: Kerala in relation to national and international situations, Mar. Fish. Infor. Serv., 162:1-22.

Erftemeijer, P.L.A. and Nukul Ratanadukul, 1998. A case study of mangrove rehabilitation efforts in Southern Thailand. International Workshop on the rehabilitation of degraded ecosystems, Phuket: 263-68.

Food and Agriculture Organisation, 1999. The State of World Fisheries and Aquaculture, 412-422.

Food and Agriculture Organisation, 2001. Growth of cities and industries threaten coastal environment, FAO Fact File, FAO, Rome.

Food and Agriculture Organisation, 2001. Inland fishery enhancement in China-Methods and effects of socio-economic and institutional factors, FAO Fisheries Circular, 995:1-26

Gabdegesign, C., 1996. Management of forest resources by women, Environmental Conservation, 23(2): 115-119,

Government of Kerala, 2001. Panfish Book-Ernakulam District, 44: 315, 319. 323, 335 -342.

Krishna Srinath, 1993. Empowerment of women through extension education-an action research in a fishing village, Ph.D. Thesis, Avinashilingam Deemed University, Coimabatore.

Krishna Srinath and S. Balasubramaniam, 1997. Role of women in coastal zone management, Proc. Seminar on Coastal Zone Management, M.S. University, Nagercoil.

Kumar, U. and M.J. Asija, 2000. Biodiversity-Principles and Conservation, Agrobios (India): 25-109.

Meltzoff, S. K. and Board Kenny, 1996. The rise of women in fisheries management. The Marisquadora of Illade Arousa, Galicia, Fishery Resources Utilisation and Policy, Oxford and IBH, New Delhi, p 349-360.

Meynert Mariam, 1996. Nutrition, forestry and women, 50 Years of Indian Farming, p 270-272.

Panda, S.M., 2000. Gender sensitive forestry interventions and potential for empowering women, Indian J. Agricultural Economics, 55 (3): 412-422.

Woroniuk, B. and J. Schalkwyk, 1998. Coastal zone management and equality between men and women, SIDA: 1-3.

Fish drying & involvement of women in Gujarat
(Courtesy : Dr. M. P. Singh Kohli CIFE, Mumbai)

View of Versova Fish Landing Centre, Mumbai
(Courtesy : Dr. M. P. Singh Kohli, CIFE, Mumbai)

Women in Shell Collection & Segregation
(Courtesy : Dr. K. Shrinath, CIFT, Kochi)

Women in Fish Processing Industry
(Courtesy : Mr. K. Kunhi Mohamed, MPEDA, Kochi)

Women in Net Making
(Courtesy Dr. M. P. Singh Kohli, CIFE, Mumbai)

Women in Ornamental Fish Culture
(Courtesy : Dr. Shaleesha, M S Swaminathan Foundation, Chennai)

Changing Roles of Fisherwomen of India- Issues & Perspectives

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Introduction

"I have only one request,
I do not ask for money, although I have need of it,
I do not ask for meat. I have only one request,
And all I ask is that you remove the road block from my path"
(Quoted by Samantha, 1995)

This is the cry of an African woman. The fact that women, despite the slow but emerging recognition of their silent contribution, still face stumbling blocks in their path towards development, makes this cry reverberated around the world. India, having agriculture as the main occupation and women playing a significant and crucial role in it, is also not an exception. In agriculture, their contributions are at least quantified and are found to be about 50 per cent whereas in fisheries, their picture is not at all visible and their cry is not louder enough to catch the attention of the outer world.

According to a United Nation's report women perform 2/3rd of the world's work, receive only 10% of the world's income and own only 1% of the total assets. The transformation of fisheries sector, mainly brought by mechanization, has engendered multi-faceted changes in the role and contribution of fisherwomen.

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A study was conducted by Central Marine Fisheries Research Institute, Kochi to review the role being played by women in marine fisheries sector of India. Both primary and secondary data was collected and analysed. In pre-harvest sector sufficient information could not be derived hence investigations were made in selected area using PRA and interactive sessions.

Indian scenario

There are about 0.5 million fisher households located all along the Indian coast and a total of 3 million fisherfolk inhabiting the coastal villages. The average number of sea going fishermen is 282 in a coastal village. Out of the 1.2 million fisherfolk in post harvest sector, women occupy a considerable proportion of more than 0.5 million (Sathiadhas *et al.*, 1998). They play a significant role in the pre and post- harvest operations in capture fisheries while their presence is conspicuous in all the stages of culture fisheries. Their role in household management is far higher than the women of other sectors. Majority of the labour force in the pre-processing and processing plants of shrimp are women. Women also occupy a very good proportion of the workforce in export oriented processing of cuttlefish, lobsters, and finfish varieties.

In Tamilnadu, women engage themselves in seaweed collection in addition to the traditional jobs of fish curing, marketing, net making and prawn seed collection. Salt-pans are another major sector, which employs a lot of women in Tamilnadu, where the ratio of women to men is 4:1. In Andhra Pradesh, the main occupation of women include collecting fish, and molluscan shells in addition to their contribution in fish drying, curing, marketing, shrimp processing and net making. In West Bengal, fishermen spend only little time in actual fishing and engage themselves in net making, which in other states is dominated by women. Women from communities other than fisherfolk carry out fish drying and curing. In Maharashtra women play a major role in fish marketing and control

the entire fisheries economy revolving around Mumbai. In Gujarat women mostly do the handling and processing activities.

In Lakshadweep, particularly Minicoy, the major fishery products known as *masmin, riha*, and *akru* of tuna are produced mainly by women. However, the overall structural changes in the marine fisheries sector brought about by mechanization, extensive use of ice in local markets and export oriented development efforts have dislodged a good proportion of women from employment sectors like fish drying, curing, dry fish trade and net making. The scope of providing alternate employment for more women in the sector and thereby invigorating their socio-economic progress as well as the growth of marine fishery sector remains unexplored.

Direct contribution of fisherwomen in marine sector

In capture fisheries, the role of fisherwomen in the post –harvest sector had been analyzed by many researchers (Madhu, 1989; Krishna Srinath, 1998). The entire processing sector is highly dependent on women as more than 90 per cent of the work force in prawn peeling and 70 per cent in the processing of other fishery products are constituted by them (Table 1).

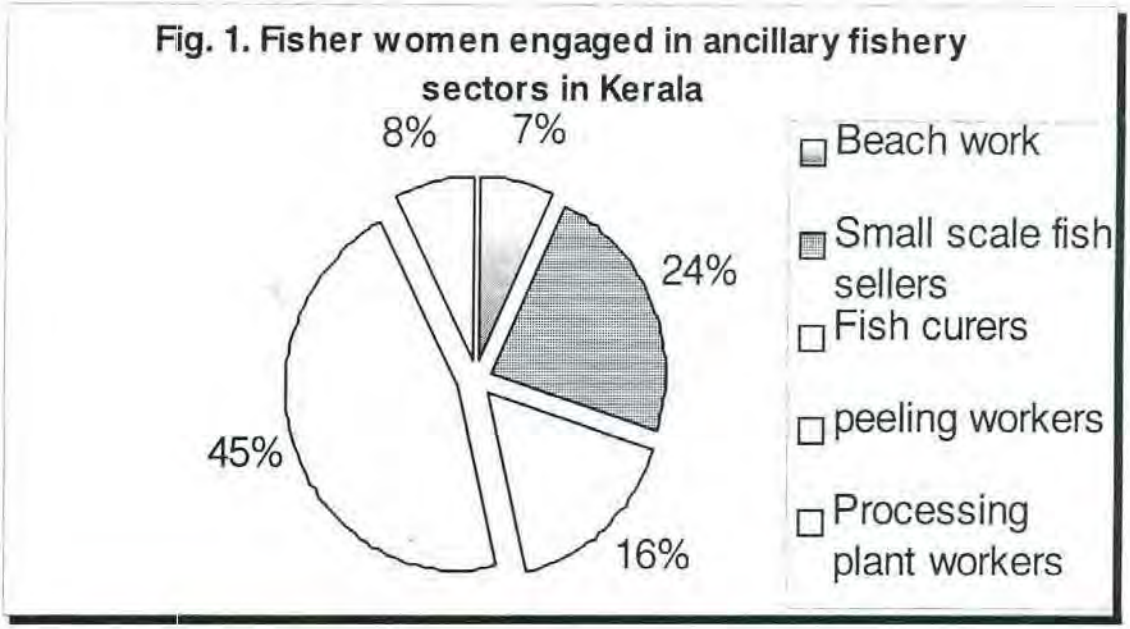
Table 1. Direct contribution of fisher women in marine sector

Sl. No.	Category	Total no. of workers	No. of women workers	Percentage
1	Beach workers	20,843	5,612	26.92
2	Small scale fish traders	67,527	20,220	29.94
3	Fish curers	21,103	14,028	66.47
4	Peeling workers	43,620	39,397	90.31
5	Processing plant workers	11,051	6,504	58.85
Total		1,61,144	85,761	53.22

(Source: Velayudhan, 1999)

Out of the total working fisherwomen, maximum number are engaged in prawn peeling sector followed by the small scale fish traders (Fig.1). Women also play a major role in fish marketing (small scale trading), value addition, and aquaculture practices. Still as in any other state, many constraints including occupational segregation and wage discrimination are noticed among fisherwomen of Kerala.

Fig. 1. Fisher women engaged in ancillary fishery sectors in Kerala



Indirect contribution of fisherwomen in marine sector

In a fisher's family, the responsibility of household management -food, childcare, education, health, sanitation, financial management and the responsibility of getting and repaying debts will be mostly on the women's shoulders. The burden of her responsibilities doubles in the off-season. After mechanization and intensification of multi-day fishing, the household responsibility of fisherwomen has increased to a greater extent. The Daily routine diagram (Fig.2), of a fish trading woman of Edava, Kollam disrtict of Kerala who purchases her fish from a traditional landing centre and sells at local market reveals the magnitude of strain in her day-today life.

Besides, in many places women are running petty shops, selling different inputs needed for fishing and other household articles. In Vizhinjam landing centre of Kerala the diesel supply units for boats are the monopoly of women. Mobile food selling units run by women in landing centres serve the purpose of supplying break fast and snacks to fishermen. The extent of involvement of fisherwomen in household management in the districts of Thiruvananthapuram and Kollam are shown in Table 2.

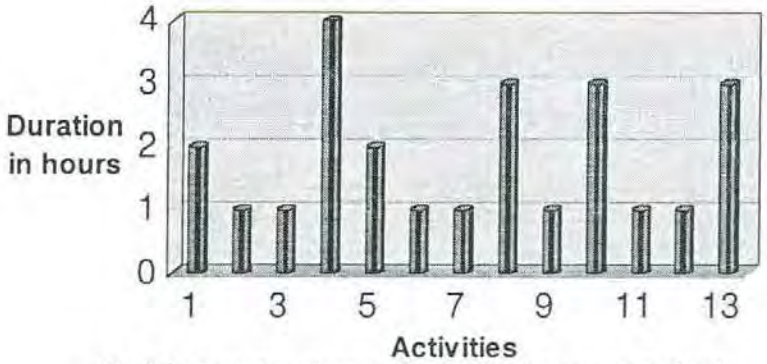


Fig.2. Daily routine diagram of a fish trading woman in Kerala

Sl. No	Activities	Time	Duration (hrs)	Sl. No	Activities	Time	Duration(hrs)
1)	Cooking	4-6 am	2	8)	Fish trading	4-7 pm	3
2)	Landing centre	6-7 am	1	9)	Shopping for grocery	7-8 pm	1
3)	Travelling	7-8 am	1	10)	Household activities	8-11 pm	3
4)	Fish trading	8-12 am	4	11)	Rest	11-12 pm	1
5)	House hold activity	12-2 pm	2	12)	Drinking water collection	12-1 am	1
6)	Landing centre	2-3 pm	1	13)	Sleeping	1-4 am	3
7)	Traveling	3-4 pm	1				

Table 2. Indirect contribution of Fisher women in marine sector

Sl. No.	Activities	Contribution of women
1	Cooking	96%
2	Childcare & education	89%
3	Family health	84%
4	Sanitation	81%
5	Finance (including repayment of debts)	54%
6	Petty shops in landing centre	56%
7	Diesel supply for boats	41%
8	Mobile food units	66%

Women's role as a homemaker, though supportive, is indispensable for the men to go for fishing. Activities like cooking, childcare, children's education, family health and sanitation are almost exclusively looked after by women. However an examination of the demographic development indicators like population growth rate, sex ratio and infant mortality among the fisherfolk reveal the prevalence of gender injustice and socio-economic marginalisation.(Table 3.)

Table 3. Demographic development parameters among fisherwomen of Kerala

Parameters	Kerala	Fishing villages
Population growth rate	1.9	2.3
Sex ratio	1032	972
Infant mortality	40	85

Source: Report of State Planning Board, Kerala (1997-2002)

The much-acclaimed social progress in Kerala, also indicated by surplus females, has found to be lacking among fishing communities. The well being of fisherwomen measured on the basis of capabilities like morbidity, longevity, nutrition and education has been found to be low (Pushpangadan and Murugan, 2000). Even though neo- natal death is more among male children, the high population growth rate among fisherfolk is not reflected in the proportion of girl children. It leads to the assumption that higher rate of mortality is among girl children. The dowry system and marrying the girls off at an early age devalues girl child and the resulting neglect can be one of the possible reasons behind this.

Trend in role transformation of fisherwomen

The course of changes in the role of fisherwomen has traversed during the major phases of technological transformation in household management as well as pre and post-harvest activities in the fisheries sector of the state is assessed and given in Table 4.

The indirect role women play are concerning decision making, financial management, family welfare, net making, running petty shops and mobile food supply for the workers at the landing centres and fish markets. The more direct involvement of women are in post-harvest related activities *viz.* peeling, fish trading, export oriented works, making value - added products, small scale entrepreneurship, fish curing, etc.

Table 4. The trend in role transformation of fisherwomen in Kollam and Trivandrum districts of Kerala after the Indo-Norwegian project

Sl. No.	Role Items	Extent of involvement of women during technological transformation		
		Traditional (1952-62)	Motorization & Mechanisation (1962-98)	Multi-day fishing (1998-)
1	**Indirect roles**			
	a)Decision making	+ +	+ + +	+ +
	bFinancial management	+ +	+	+ +
	c)Family welfare	+ +	+	+ + +
	d)Net making	+ + +	+ +	+
	e)Petty shops	#	+ +	+ +
	f) Mobile food supply	#	+ +	+
2	**Direct roles**			
	a)Peeling	+	+ +	+ + +
	b)Fish trading	+ + +	+ +	+
	c)Export oriented processing	*	+	+ +
	c) Landing centre oriented	+ + +	+ +	+
	works	+	+ +	+ +
	d) Value addition	*	+ +	+ +
	e) Small scale entrepreneurship	+ + +	+ +	+
	f) Fish curing			

\+ poor involvement # Not available

\+ + medium involvement + + + high involvement * Nil / meager

The general improvement in the well being of the fisherfolk brought about by the twin forces of motorisation and mechanization have lessened the burden of womenfolk to a great extent by freeing them from taking up responsibilities of supplementary income generation , debt management etc., in addition to household management. This change is quiet characteristic of womenfolk in any society that ascends the class hierarchy. The increase in the income of the

husband has made the role of wife redundant or confined to that of a typical housewife. Her role in decision making has declined (Shet, 1994) probably because she is not having any stake in the earnings of her husband. Though the financial dependence makes her less assertive, uncharacteristic of an empowered woman who ought to have an equal say in the affairs of the household, she is able to lead a less stressful life.

However, the advent of multi-day fishing in recent times seems to have altered this pattern. Adoption of modern equipment like fishfinder, GPS, and mobile phone has enabled the fishermen not only to venture for deep-sea fishing but also to extend fishing trips up to 10 days. In Kerala the gross earnings realised for a multi- day trawler per trip is Rs. 24935 with the operating cost of Rs.15433 (Kumar and Sathiadhas, 2001). Though the family income is more, the continued absence of fisherman for a long time forces her to bear more responsibilities.

A number of interventions both by government and non -government agencies have acted as catalysts in this process of transformation. The social mobilization (and consequently unionization later) among the fisherfolk in Kerala for the first time was spearheaded by an agitation led by a *Mahila Samajam* in Trivandrum district for a statutory right to use public transport by women fish vendors(Meynen, 1989).

The research institutes like CMFRI has been in the forefront of developing women-friendly technologies like *Mahima* shrimp feed, which was popularized through new models of women empowerment. Various extension interventions for propagating mariculture technologies among the women fisher-folk have been attempted at coastal villages of south- west coast (Immanuel *et al.*, 2000). Nevertheless, the follow-up studies have indicated that the sustainability of most of these interventions is at stake.

Major issues confronting the fisherwomen of capture fisheries

Social issues

In a fishers' community women either like taking the roles of a housewife or go for some income generating occupation. The various social issues concerned by the fisherwomen and their perception towards the issues were ranked and given below in Table 5. In a traditional fisher's society, women's social status is often referred with respect to that of her husband. When a fisherwoman goes for some job, it will be mostly counted as the inability of her husband to support the family. Because of the same reason the women usually do not enjoy the freedom to go for some work or interact with change agents, especially when the agents are males. Nevertheless, few exceptions are there who overcome the barriers of society in the struggle for existence and they, in due course develop behavioral modification, characteristic of androgyny (Viswanathan, 1996).

Table 5. Perception of fisherwomen towards various social issues

Sl. No.	Issues	Rank
1	Poor social status	I
2	Poor social acceptance	II
3	Lack of representation in fishery cooperatives and other local bodies	II
4	Heavy dowry system	IV
5	Lack of platform to express	V
6	Restriction to go for work	VI
7	Men do not take supportive role	VII
8	Less interaction with development agencies	VIII
9	Division of labour and wage discrimination	IX

The respondents did not perceive division of labour and wage discrimination as important. This problem can be either due to society's wrong concepts about male- female roles or based on the level of physical ability and most of the fisherwomen found to be supporting the latter view. Fisherwomen were found to lack an overall picture of their works environment and accept whatever meager facilities provided to them. The tendency of profit being fixed as the sole motivation coupled with autocratic style of management prevailing in majority of the seafood processing centres of Kerala as reported by Sassi and Ramachandran (1998) could have worsened the extent of marginalisation of women labourers.

Economic issues

Fisherwomen in any work sector can be found occupying the position of a sub category or performing supportive roles. At landing centers women engaged in fish drying collects small sized by-catches. Though highly nutritive and helps to meet the nutritive demands of the low income groups, by-catches fetch very low price and a poor profit margin for the women. In Kerala there are 2703 fish markets comprising 185 wholesale and 2518 retail outlets which includes 1126 wayside markets (Anon., 2000). In markets women usually sell low value products in a remote corner. Wholesalers among women are very few. Exceptions like the women dry fish traders operating at *Chala* market in Trivandrum, who procure the products in bulk from markets as distant as Mangalore, are very few (Muhammed, 2000). The major economic constraints ranked by the respondents are given in Table 6.

Though many of the respondents rated poor income as one of the major economic problems, it is only symptomatic of some other institutional issues. Lack of alternate employment in off-seasons lead to many complications. They are forced to borrow money usually from private moneylenders at very high interest rate of 10% /month or even more. Though they work hard in peak season,

they can hardly pay back the money, as it would have doubled by then. The vicious circle of indebtedness continues. The problem is not the lack of opportunities but is of unawareness about the avenues.

Table 6. Perception of fisherwomen towards various economic issues

Sl. No.	Issues	Rank
1	Lack of fool proven marketing channel	I
2	Poor income	I
3	Improper saving scheme	III
4	Lack of marketing information	III
5	Poor working capital	V

Women in value addition sector indicated low price for products and lack of assured markets as main constraints. They sell their products to local petty shops and house holds. The improper information support on markets and lack of sound distribution networks are the reasons behind this. The exploitation by middlemen is a menace in markets. The non-availability of raw material in off-season makes the regular supply of the products difficult, which also hinder the prospects of a consistent market. But there are a few groups, which circumvent these problems. The Azhikode fisherwomen welfare society is a case in point.

Product development and market diversification: Azhikode fisherwomen welfare society

The society was established four years back under the auspices of the MATSYAFED of Government of Kerala. A total number of 9 women, who have undergone training on improved method of producing value added fish products under Integrated Fisheries Project (IFP), are engaged in value addition of fish, shrimp, clam etc. Initially they had a marketing outlet under the MATSYAFED.

Supply of raw materials is entrusted with the menfolk from their own families. They collect fresh raw materials from landing centres directly and the items are processed within four hours, giving much attention to the quality standards. The high quality of the products helped them to fetch good price and assured market. Now they supply the products to leading super markets and even export agents. Assured quality of products, integrity of group members, training in improved and hygienic methods of handling and above all their enthusiasm helped the group to reap success.

Institutional issues

It is seen from Table 7 that the inaccessibility to credit was perceived to be the most important institutional issue by the respondents. The fisherwomen are often denied credit from public sector institutions due to lack of ownership of assets. The too-formal administrative procedures for obtaining credit also make it inaccessible to small-scale entrepreneurs.

Table 7. Perception of fisherwomen about institutional issues

Sl. No.	Problems	Ranks
1	Inaccessibility to credit	I
2	Improper saving schemes	I
3	Lack of location specific development projects	II
4	Shift in focus from local markets to export markets	IV
5	Lack of job security	V
6	Insufficient information support	VI
7	Improper supply of production inputs	VII
8	Lack of professional expertise in NGOs	VIII
9	Improper legislative support	IX

Most of these institutions do not have safe saving schemes suitable for fisherwomen or they come forward to introduce innovative schemes. In this context it is worth mentioning the statement of one of the bank managers - "I don't want to create a headache unnecessarily." The gravity of the problems faced by the fisherwomen in this regard is exemplified by the case of Omana.

Easy Duck before the private money lenders: Case of Omana

"Omana is a peeling worker in a private peeling centre at Aroor in Kerala (the area with maximum number of peeling sheds and peeling workers). She has been working for the past 20 years and in season she works for about 8-10 hours per day. She is paid Rs. 3/ kg (one basin full) of prawn and her monthly income ranges from Rs. 750 to 800. But there is a general complaint of underpayment - a basin full of prawn mostly weighs more than one kg. The rate paid by the peeling shed owner, though seems to be low, is surprisingly higher than the standard rate fixed by the Government. (The present rate of Rs.2.50/ kg. was fixed almost twenty years back). Further, the present rate does not reflect the commensurate increase in wage rate of other sectors in agriculture and industry. The notoriously tedious job provides her poor income without any other benefits like provident fund, pension, accident insurance etc.

Omana has got four girl children and two boys and from whatever she is earning she wanted to save a small portion for the future. The only option she knew was a private chit company near her house where her fellow workers also deposit their savings. For one and a half years she deposited the money at the rate of Rs 150 per month. One fine morning the chit owner vanished. Omana along with other ladies made all efforts to get the money back. They even filed a suit but everything went in vein".

This is not an isolated case. Quiet often it happens, but they have no other way. The problem of unawareness about the safe saving schemes can be solved.

But the formality of procedures coupled with lack of awareness makes them shy of starting accounts in either Post Offices or similar financial institutions. The chit agents collect the money personally and all the transactions can be done orally. None of the financial institutions under the government sector have this much flexibility in their operations.

Projects designed by development agencies are often not suitable to specific locations. Quite often, some non-fishery enterprises may prove more remunerative than fishery enterprises. In such circumstances organizing fisherwomen groups for starting a plethora of fishery enterprises will in no time become lifeless.

As in any other low-income group, the infrastructure facilities are also not satisfactory. Even the basic amenities like drinking water facility, toilets, rest rooms etc. are not provided in the work places.

Though NGOs take some effort for promoting small-scale entrepreneurial development in culture fisheries, they are not receiving proper attention. It is disheartening to note that women spending their lifetime as peeling workers are still not included under the category of fisherwomen by the state government and are not provided with benefit of any of the welfare measures.

Technological issues

Technologies, as technique, affect the ways in which people do things and as a system of knowledge, affect the ways of thinking and in the same way they are not value free or gender neutral (Mukherjee, 1983). The extent of technological marginalisation experienced by fisherwomen is evident from the perception of majority that technological progress has lead to unemployment (Table 8).

Table 8. Perception of the fisherwomen towards various technological issues

Sl. No.	Technological issues	Rank
1	Technological progress leading to unemployment	I
2	Lack of innovative equipment/ method	II
3	Lack of technical advice/supervision	III
4	Lack of training opportunities	IV

Women engaged in various fishery occupations are technologically marginalised to a greater extent e.g. in clam fishery a metal teethed dragging net (*Palli*) for collecting clam is introduced which is very heavy and women can not handle it. As a result the male workers go to deeper areas and collect huge quantities in less time outsmarting the women clam collectors. The negative impact of the technological changes on the small-scale entrepreneurs is often ignored.

The women fish traders form a good proportion of petty fish traders (in Kerala out of the 67,527 small scale fish traders 20,220 are women). The fish trading women face severe competition from not only the menfolk who use two-wheelers in domestic marketing but also the agents of the export companies resulting in the non availability of quality finfishes which commands high consumer preference in local markets. Currently, they also face the same fate of the net makers who have almost vanished from the scene.

The root causes for these problem lies somewhere else. Why the women are not forth coming to use two wheelers? The fish marketing ladies of Kerala generally belong to middle aged and above categories for which it would look funny to ride bicycle or mopeds. If so why youngsters are not there in the field who could have made such an attempt? It is against the social values of the fisherfolk to send an unmarried, young girl (komary) for fish trade. Establishment

of fish booths for women at retail level in prominent places including markets, preferential allocation of prominent place in markets, etc. can be tried. But even in Kerala where women form major chunk of extension personnel farmwomen are not generally contacted by extension workers (Menon and Bhaskaran, 1988). This may be the reason for the delayed /not even delayed reaching of technological inputs to fisherwomen.

Personal issues

When the women fishers were asked about the problems they experience at personal level, they listed a number of issues. It may be seen from Table 9 that ergonomic problems were rated as the most important issue. This is not surprising as the working climate for most of the fisherwomen is deplorable whether it is a market or a peeling shed. The case of a peeling worker, Mrs.Gracy highlights the poignancy of this problem

Poor ergonomics taking its toll: Case of Gracy

Gracy was working in a private peeling center for the past fifteen years. Like her fellow workers she also had to do the job in squatting position on the wet floor, which may be often slippery. Once she fell down and had a serious fracture in her leg. She had to spend a huge amount for treatment for which she received no support from the owner. Now Gracy, who is unable to do any work, is idling at home. Complaints of arthritis, skin disorders, back pain are common among the peelers. (Arpita, 2000). Even though MPEDA has stipulated stringent guidelines for scientific design of peeling sheds minimizing the hardships of peelers, majority of the pre-processing centers have not adopted it. The various labour welfare measures are also not provided to mitigate their suffering, as they are not in the organised sector.

Table 9. Perception of the fisherwomen towards various personal issues

Sl. No.	Personal Issues	Ranks
1	Ergonomic problems	I
2	Lack of alternate employment opportunity in off season	II
3	Lack of access to change agencies	II
4	Lack of ownership of assets	IV
5	Irresponsible nature of counterparts	V
6	No time to look after household activities	VI
7	No time / mind set to keep social contacts	VII
8	Low literacy rate	VIII
9	Lack of political commitments	VIII

Poor access to change agents is not due to their dearth but their apathy towards their mission. Simultaneously the change agents concentrate on menfolk who are more socially visible by virtue of the traditional patriarchal social system.

Lack of ownership of assets is also discussed under institutional problems, which is an outcome of the social marginalization. Irresponsible nature of spouse indicated by alcoholism, gambling etc. was another major complaint. Interestingly this was found related with the introduction of mechanization. Lack of time to look after household affairs and keeping social contacts create some imbalance both in the family and society but these are minor consequence of the technological as well as social marginalisation, which are to be dealt with appropriate measures. Low literacy rate and poor political commitment of fisherwomen seems to be very minor in their view, but are most important factors underlying the above issues.

Psychological issues & methodological issues

All the above issues cannot be solved by equipping or empowering

women as the issues are overlapping and are of course linked with the problems and prospects of their counter parts. Even though some important psychological as well as methodological factors were identified which needs attention.

A fisherwomen should develop interest in and desire to seek changes in existing practices related to farm and home and adopt changes as and when practical and feasible *i.e.* she should get enough opportunities for developing her *innovation proneness*. The perception of women on the improved practices could be marred by the results of their past experience and knowledge. Thus, the extent of *risk orientation* is highly important in leading a successful career. *Self-awareness* shows that the level of awareness a fisherwoman has about her potentials and drawbacks, which is directly related with entrepreneurial skill development. An individual's orientation towards achievement of maximum economic benefits in his or her profession indicates the extent of *economic motivation.*

Even the most conservative program planner seems to be convinced that any development program should be charted out taking these issues as a main concern of the program. Here the role of HRD programs is to be mentioned separately. HRD training, interactive discussion sessions on successful cases, different motivation techniques and above all close monitoring and follow up- all in a participatory mode are to be taken seriously while implementing development programs.

Many of the research works / development programs aimed at the empowerment of women themselves are gender biased which indicates some *methodological bias*. The objective of most of these efforts will be women oriented, attempting to give autonomy to the women. These programs forget their counter parts or treat them as a separate entity. For example impact of mechanization on fisherwomen is analysed from the women's angle. According to Shet (1994) women have less decision making power in the mechanized sector. In

all these cases the role of husbands as an intermediary as well as impact point in the change process remains under investigated. In other words an integrated approach is necessary for a sustainable development. The role perception of fisherwomen is to be studied along with the role expectation of their husbands to arrive at meaningful solutions. Even then as Muylwijk (1995) said, women themselves have to decide which aspects are more important to them and what mode of approach they need. If the need felt is an integrated approach, then autonomy means integration.

Conclusion

An improvement in the fisher's economy alone cannot be taken as the symbol of development. Empowerment of the individuals, both male and female members should be assured which gains significance in the context of ever changing technological options in marine fisheries. There are many areas in capture fisheries sector with ample scope for employing fisherwomen. Currently, there are about 50 factories in the country manufacturing *agar agar* and *algin*, for which seaweed is the only source. Now 60-70 per cent of the industrial need is met by imports. The seaweed farming technology developed by CMFRI can not only reduce the dependence on imports but also create substantial employment opportunities especially for women. Several mariculture technologies ensure enough scope for accommodating women in large numbers. In inland fisheries, the total production has increased ten fold over four decades, while that was only four times in capture fisheries (Gopakumar, 1998), which indicates the scope for generating more employment avenues in culture fishery enterprises like backyard prawn hatchery, integrated finfish culture, crab culture/fattening and shrimp culture in coastal villages. Although attempts have been made to achieve convergence in the sector by various government departments and agencies, the possibilities of social and economic development through incorporating more

women participation has not yet been successful. More effort is to be put towards filling the gaps in program planning rather than program implementation. The various social, psychological, institutional, and economic issues challenging empowerment of fisherwomen have to be seriously taken into consideration while chalking out new development strategies. Researchers also have to pay sufficient attention for identifying the needs of fisherwomen and thereby generating women- friendly technologies.

Women empowerment and thereby the community development through combined efforts of men and womenfolk requires a holistic approach. As Amartya Sen (2001) has rightly observed *"there are no good reasons to abandon the understanding that the impact of* ***women empowerment*** *in enhancing the voice and influence of women does help to* ***reduce gender inequality*** *of many different kinds, and can also* ***reduce the indirect penalty that men suffer from the subjugation of women***".

References

Anon., 2000. State level workshop on Fisheries Development. NABARD, Trivandrum.

Arpita, S., 2000. Evaluation of socio-economic conditions and ergonomical problems of women engaged in prawn peeling in Mumbai region. Project report , CMFRI.

Gopakumar, K., 1998. Utilisation of by-catches and low-value fish in India. In James , D. G. (ed.), Fish utilisation in Asia and Pacific . Proceedings of the APFIC symposium, Beijing, 24-26 Sept.

Immanuel, S., N. Kumar, S. Ashaletha, C. Ramachandran and V. P. Vipinkumar, 2000. Empowerment of Coastal communities through fisheries extension. Project report, CMFRI

Kumar, N. R. and R. Sathiadhas, 2001. Economics of resource management and socio-economics of small-scale fisheries. Project report, CMFRI.

Madhu, S.R., 1989. Fisherwomen of the Bay of Bengal, Naga, 12(2):3-5.

Menon, A.G.G. and C. Bhaskaran, 1988. In Kerala, the coconut country technology alters traditional attitudes. Indian Farming, xxxviii (8):45.

Meynen, Wicky , 1989. Fisheries development, resource depletion, and political mobilization in Kerala: the problem of alternatives. Development and Change, 20: pp.738-39.

Muhammed, P.B., 2000. "Matsyavipaniyude kanapurangal' Published by Extension Division of Matsyafed, State Department of Fisheries.

Mukherjee, M., 1983. Impact of modernisation on women's occupation: a case study of the rice-husking industry of Bengal. Indian Economic and Social History Review, 20 (1): 27-45.

Muylwijk, Joke, 1995. Gender issues in agricultural research and extension-autonomy and integration. In Samantha, R.K. (ed.), Women in agriculture-perspective, issues and experiences, pp.1-23. MD Publications, New Delhi.

Pushpangadan, K. and G. Murugan, 2000. Gender bias in a marginalized community- a study of fisherfolk in coastal Kerala. Working paper, Center for Development Studies, Trivandrum.

Samantha, R.K., 1995. Improving women farmers' access to extension services. In Samantha, R.K. (ed.), Women in agriculture- perspective, issues and experiences, pp.1-23. M. D. Publications, New Delhi.

Sassi and V. A. Ramachandran, 1998. Studies on the organisational structure, leadership style and communication in the seafood industry in Kerala with respect to their applicability for total quality management. In James , D. G. (ed.), Fish utilisation in Asia and Pacific .Proceedings of the APFIC symposium, Beijing, 24-26 Sept.

Sen, Amartya, 2001. Many faces of gender inequality. Frontline, November, 2001.

Shet, Muktha, 1994. Impact of fisheries technologies on fisherwomen. In Giriappa (ed.), Role of fisheries in rural development, Daya Publications, New Delhi.

State Planning Board, 1997-2002. Report of the Task force on fisheries. Government of Kerala.

Velayuthan, T. D., 1999. Issues for fish marketing and scope for intervened by the local bodies. Fishing Chimes, 18 (11).

Viswanathan, S., 1996. Women and work-from housewifesation to androgyny. *Economic and Political weekly*. November 9-16, 1996.

Food and Nutritional Security of Women in the Traditional Fishing Households of Thiruvananthapuram District of Kerala

*M. Jaleela**

Introduction

Food security is about people. It is about the access by all people at all times to safe and active life. It is about a life free from the scourge of malnutrition and starvation. Food security is about devising long term perspectives and plan to raise agricultural productivity and national food supplies and also to meet the immediate food and nutritional needs concerning hundreds of millions of individuals (Ghosh, 2000).

At the household level, food security is defined as the capacity of the household to procure stable and sustainable basket of adequate dietary intake of each member of the house hold at all times in order to lead an active and healthy life. In individual households, food security is a daily concern of consumption and inter – household resource allocation (Food Policy Research Institute, 1992).

In India a staggering 320 million people live below the poverty line. Nearly 50% of the children below 5 years are malnourished. Since the mothers are malnourished, one third of the newborns have low weight. Poverty has been identified as the root cause for household food insecurity and therefore, actions related to attaining food security would necessarily have to be linked with the issue of poverty alleviation. The vulnerable groups include farmers living on marginal lands, landless or temporary labourers, small –scale fishermen, forestry workers and the urban poor. Within these groups again, the most affected lot are the children and the women (Ghosh, 2000).

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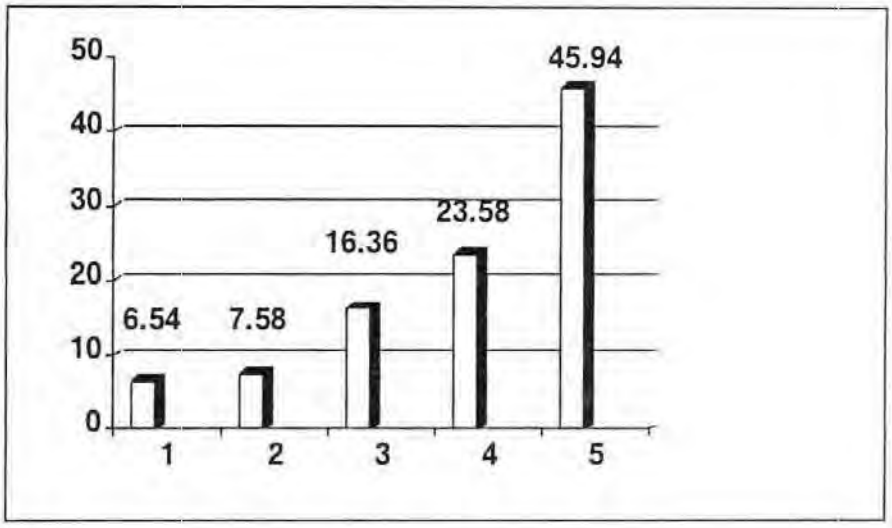
Nutritional security is an important dimension of the national food security. Though India has demonstrated impressive production and productivity in agriculture, horticulture, dairy, poultry and fisheries sectors; the per caput consumption, as well as the calorie intake of the vast majority of the rural poor, especially of its vulnerable sections, such as women and children, is yet alarmingly distressing. According to the World Bank's report on 'Improving Women's Health in India', iron – deficiency linked anemia is widespread among Indian girls and women, affecting as high as 50-90% of pregnant women who mostly suffer from energy deficiency of the order of 1000 calories per day during pregnancy resulting in world's highest rate of maternal mortality in India (Sarkar, 2001).

A study on the food consumption pattern of marine fishermen community showed that the consumption pattern could satisfy only 75% of calorie and 50% of protein requirement. This inadequacy is due to the low purchasing power, lack of variety in the diet and low productivity of coastal areas (Krishna Srinath, 1987). A case study on the food and nutritional security of women among the traditional fishing households was conducted in Thiruvanthpuram district of Kerala. The methodology included personal interviews and observations. Information was also collected from secondary sources including records of local administration.

Participation of women in fishing sector

The ratio of men and women in the fishing sector is 1000 : 972 in Kerala (State Planning Board, 1997) .There are 0.771 million fishermen families, 0.016 million are fisherwomen. Of the 0.224 million families in the inland fishing villages, 0.005 million are fisherwomen. Most women work in fishing related sector. Of the 0.164 million labourers in the fishing related sector, 0.086 million are womenfolk. Among the women workers in fishing related sector; 45.94% are

working in the peeling sector, 23.58% are engaged in small scale fish trading, 16.36 % are fish processing workers (salting and drying) 7.58% are working in processing factories and the remaining 6.54% are working in the beach (Mathsyamekhala,1998).



1. Women workers in the beach
2. Women workers in the processing factories.
3. Women workers engaged in processing work like salting & drying
4. Women workers engaged in small Scale fish marketing .
5. Women workers in the peeling Sector

(Ref. State Planning Board. 1997)

The women workers in the fishing sector are the most backward among the working women. There are a number of reasons for their backwardness namely traditional beliefs, superstitions, neglect, economic weakness, illiteracy etc.

Women engaged in fish trading

The womenfolk engaged in fish trading experience great hardships. In South Kerala, it is a regular feature to see women engaged in fish trading, waiting at the beaches with aluminum vessels from the early hours of the day. If the family owns fishing vessels and nets, it is the housewife who sells at least a small portion of the catches. Those who have no fishing equipment, work as labourers and get a small share of the catches, which is sold by womenfolk. Majority of the womenfolk obtains loan from intermediaries and purchase fish and carry them on

head - load to houses and markets for sale traveling long distances. On way back to their homes they buy necessary food ingredients required for the dinner.

Food and nutritional security of women in the traditional fishing households

The women in the traditional fishing households do not get the security they deserve in terms of food and nutrition due to poverty, menfolk's addiction to alcohol, poor quality of life, substandard living conditions and the liabilities of the fishing community.

Economic condition of the fisherfolk

It has been pointed out that the per capita income in the fishing sector is low, rampant unemployment and the living conditions of the fishing community are deteriorating. According to the report of the Working Committee constituted by the State Planning Board of Kerala on the formulation of the IXth Plan, the difference between the per capita income of Kerala and that of the fisherfolk for the year 1980-81 was Rs. 514/-. The per-capita income increased to Rs. 1008/- in 1994-95(Table1). The increase in the per- capita income of the State was Rs.605/- , but that of fisherfolk was only Rs. 14/- (Mathsyamekhala ,1998).

Poverty is thus the primary cause of food insecurity. The household is not a homogenous unit, with women and girl children tending to suffer more from endemic hunger (Swaminathan, 2001).

Table 1.Per Capita Income State Average and Fisherfolk Average (Kerala)

Per Capita Income	1980 – 81	1990- 91	1994- 95
Fishing Sector (Rs.)	994	1023	1008
State (Rs.)	1508	1815	2113
Difference	514	792	1105

(Ref. State Planning Board, 1997)

Liabilities of the fishing community

The fishing community is forced to borrow money from the intermediaries for purchase of boats and nets, to meet the basic needs during lean months, and to meet the expenses of religious ceremonies etc. This borrowing is in addition to the already existing liabilities for generations. There is a tendency in this sector to squander the daily earnings in liquor. They are not prone to save their earnings for tomorrow. This tendency has been a bane on this community, the women in the fishing households being the worst sufferers. They have to work for long hours in order to meet their family's daily needs.

A case study of women among the traditional fishing households

The case study was carried out on five fisherwomen selected from five fishing villages. From the socio–economic profile it can be seen in Table 2 that the living condition were poor (the daily income of these fisherwomen ranges from Rs.50/- to Rs.75/- except for one who had an average daily income of Rs. 100/-). Out of the five cases, two had not received any education at all. The number of pregnancies and number of children were high in four cases. Two of the women had delivered their children at home. Two children were lost before they attained the age of five years by the fisherwomen who had a large number of pregnancies. Only three of the five women had used any family planning methods.

Table 2. Socio-economic Profile

	Case-1	Case-2	CASE-3	CASE-4	CASE-5
Village	Valiyathura	Vizhinjam	Poonthura	Puthenthope	Kovalam
Age	52	38	40	35	65
Education	Nil	3rd Std.	2nd std.	7th Std.	Nil
Age at marriage	18	17	18	18	15
Dowry	Gold worth Rs.200/-	Rs. 300/-	3 cents of land	3 soverigns & Rs.1000 /-	1 cent of land
No : of pregnancies	8	9	10	2	11
No: of births in hospital	Nil	7	6	2	Nil
No: of children lost under 5 years of age	2	2	3	None	2
Family Planning Status	undergone hysterectomy	had not undergone any type of family planning	Sterilization was done	Sterilization was done	had not undergone any type of family planning
Husband's occupation	Fishermen	Fishermen	Fishermen	Fishermen	Husband expired
Occupation	Fish trader	Fish trader	Fish trader	Fish trader	Fish trader
Type of house	Thatched hut on 2 ½ cents of land	Thatched hut on 2 cents of land	Thatched hut on 3 cents of land	Thatched hut on 3 cents of land	Thatched hut on 2 cents of land
Daily income (Rs.)	60-80/-	50-75/-	50-75/-	100-125/-	50-75/-

The dietary pattern of the women given in Table 3 revealed that they were not consuming adequate food. They did not follow a strict meal pattern. Out of the five cases, four did not take any breakfast. They took lunch usually at 3 or 4 p.m. when they returned home after selling fish. They had tea and some snacks at mid time, their pocket permitting. Another important thing to be noted is that

their diet lacked variety. Their diet usually comprised of rice and fish. They did not usually consume vegetables and pulses.

Table 3. Dietary pattern

	Case –1	Case – 2	Case –3	Case – 4	Case –5
Early Morning	Black tea	Black tea	Black tea	Black tea	Black tea
Break fast	-	-	-	Puttu, Banana	-
Mid Morning	Kanjee	-	Tea Vada	-	Rice , fish curry
Lunch	-	Rice, Rasam, Fish curry	-	Rice, Fish curry	-
Mid Time	Tea , Vada	-	Rice, Fish curry	-	Tapioca, Black tea
Evening	-	Tea	Black tea	Tea, tapioca	-
Dinner	Rice, Tapioca, Fish curry	Kanjee , green plantain pugath, fish curry	Kanjee, green chili-tamarind chutney	Kanjee, fish curry	Kanjee

The nutritional profile of the cases presented in Table 4 showed that they were not consuming the required daily allowance of calories and protein. From the nutritive value of the diet consumed by the fisherwomen, it can be concluded that the diet of the women in the traditional fishing households met 69.66% of their calorie and 75.8% of their protein requirements. Fish was the major source of protein in their diet.

Table 4. Nutritive value of the diet and deviation from required daily allowance(RDA)

	Calories (K Cal)	Deviation from RDA (K Cal)	Protein (g)	Deviation from RDA (g)
CASE –1	1529.30	-570.70	41	-9
CASE – 2	1251.50	-848.50	37.60	-12.40
CASE – 3	1231.30	-868.70	34.95	-15.05
CASE - 4	1773	-327	44.50	-5.50
CASE – 5	1568.50	-531.50	31.45	-18.55
R.D.A	*2100 K Cal.*	-	*50 gm*	-

Conclusion

Even though Thiruvananthapuram is one of the leading maritime districts of Kerala which contributes substantially to fish production, there is food and nutritional insecurity among the women in the traditional fishing households of Thiruvananthapuram district. The fisherwomen in the traditional fishing households are not having the food and nutritional security they deserved. This food and nutritional insecurity can be attributed to poverty, low income and purchasing power, big family size and addiction of their husbands to liquor.

References

Ghosh, 2000. In pursuit of national food security in the new millennium. Farmer and Parliament, XXXVI (1).

Krishna Srinath, 1987. Some observations in the food consumption pattern of the marine fishermen community Marine Fisheries Information Service CMFRI.

Mathsyamekhala, 1998. State Planning Board Fisheries Department . Govt. of Kerala.

Sarkar, A. N., 2001. National Food Security Perspectives with a Global Vision' Indian Farming, Vol. 50, No: 10.

State Planning Board, 1997-2002. Report of the task force on fisheries. Government of Kerala

Swaminathan M. S., 2001.The Best State: Eleven steps to excellence. The Hindu, Sunday, December 2, 2001.

Community Management Roles of Fisherwomen in Kerala

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Introduction

Women play an indispensable role in maintaining the social and cultural foundation of the fishing communities in Kerala. In a multi-caste, multi-religious society these roles take varying socio-economic and cultural expressions. Women in fishing household never go to sea except for getting shells and cockles on sea fronts with rocky fringes.

Earlier, women of the fishing communities were confined to the four walls of the home mostly doing the household work. While men were the breadwinner's, women were the homemakers of the family. Now, gradually, with the increase in education, technology and greater socialization, they have begun to participate in economic activities relating to fish processing, buying and selling of fish in distant markets and also vending fish by head loads. The work participation depended on nearness to the infrastructure (Krishna Srinath, 1987).

Fish related activities and women

Women are also engaged in activities like drying of fish and salting. In northern Kerala, fish drying and processing is the main industry. Wholesale merchants of dry fish appoint women workers for sorting and drying of fish. They are paid once in three days.

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According to a study conducted by the Fisheries Board in 1998, 90.32% women participated in peeling activity. However, their wages are very low when compared to men. Due to the highly seasonal nature the job is also not permanent. The women also suffer due to the prevailing corruption in the industry. All these factors compel women migrate to other states.

According to Krishna Srinath (1995) due to increasing commercialization and opportunities, post-harvest sector is rapidly shifting hands. With the construction of centralized facilities like fishing harbors the fish landing and related activities are shifting from the traditional fishing villages. This has led to loss of opportunities for old members and entry for new members into the workforce. Migration of a large number of women to other states from Kerala is also observed. Table 1 & 2 depicts gender participation in fisheries related activities in Kerala.

Table 1. Male-female participation in fishing activities

Activities	Male(%)	Female(%)
Beach workers	73.07	26.93
Small scale merchants	70.06	29.94
Dry fish workers	33.53	66.47
Peeling workers	9.68	90.32
Processing factory workers	41.15	58.85

Source: State Fisheries Board, 1998

Table 2. District -wise distribution of fisherwomen in Kerala

Sl. No.	District	Coastal	Inland	Total
1	Thiruvananthapuram	11000	-	11000
2	Kollam	1036	515	1551
3	Alappuzha	372	744	1116
4	Pathanamthitta	-	41	41
5	Kottayam	-	1643	1643
6	Idukki	-	-	-
7	Ernakulam	395	1621	2016
8	Thrissur	57	126	183
9	Palakkad	-	-	-
10	Malappuram	185	87	272
11	Vayanad	-	-	-
12	Kozhikode	95	14	109
13	Kannur	178	483	661
14	Kasargode	3138	128	3266
	Total	**16456**	**5,402**	**21,858**

(Source: Fisheries Welfare Board, 1997)

A small part of the catch is sold by boat owner's wife. The women whose husbands do not own boats buy fish from fish merchants and sell it door to door. They are not allowed to use public transport as a result of which they use autorikshaws or vans, which causes a burden on their meager income. A

fisherwoman spends half of her time in fish markets, which are very unhygienic and lack basic facilities like drinking water and proper sanitation. After completing the sale of fish they buy the foodstuffs needed for dinner for the family. After their return they engage in their usual routine of household chores. They, thus earn an additional income for the welfare of their families, which gives them independence.

As a result of education and work participation there are major changes in the lives of fisherwomen. They are able to compete with men and are able to take better financial decisions. Thus may manage to perform the roles of homemakers and breadwinners.

The women in the fishing communities must be equipped to cope with the new demands and their awareness, resources and opportunities for effectively participating in and decision making development process. Enlightenment and education of women at grass root level, is therefore, essential.

References

Kerala State Department of Fisheries, Matsyameghala, 1997. Project report.

Krishna Srinath, 1987. Role of women in small scale fisheries – A case study in Vypeenkara Marine Fisheries Information Services, 11-14.

Krishna Srinath, 1995. Role of women in shore based fisheries activities in fisheries, paper presented at symposium on Traditional Technologies, Anna University.

A Study of Women in Fish Marketing in Kerala

*Nikita Gopal & Krishna Srinath**

Introduction

The fishing community is almost solely dependent on the sea resources for their livelihood (Krishna Srinath, 1987) and the roles that a fisherwoman plays are integral for the maintenance of the family. With intensification of the fishing effort and the decrease in production per unit resulted in fluctuations in the income of fishermen. The significance of employment of fisherwomen is paramount for the sustenance of fisher families. The woman's role has traditionally been shore-based, post-harvest activities including auctioning, marketing, pre-processing and processing (Anbarasan Karuna, 1985). Marginalisation of the these traditional roles has been observed with increasing mechanisation of fishing operations and large volume of fish being landed, increase in the money transactions and the basic landing centre activities such as auctioning, wholesale and retail purchase etc. passing into the hands of men. With almost all activities of post-harvest fisheries becoming capital-intensive women have been placed at a disadvantage since their access to resources, particularly capital, is poor, affecting their capacity to invest as well. They are no longer able to purchase the necessary fresh fish for marketing or processing (DFID-PHFP, 1998). They have little or no access to institutionalised credit, chiefly due to their own ignorance or reluctance to approach credit institutions.

Credit institutions, particularly those in the cooperative sector, thus have an important role to perform in empowering fisherwomen. A study was undertaken to review the working of fish marketing systems in Vaddy-Thangasherri region of Kerala.

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Role of MATSYAFED

MATSYAFED, a Kerala State Cooperative Federation for Fisheries Development Ltd. is an agency under the State Department of Fisheries, has been financing women in fish vending since 1989, through the Vaddy-Thangasherri Fishermen Development Welfare Cooperative Society, Vaddy. The credit extended by the agency is Rs. 3000 with Rs. 300 as the beneficiary contribution. A 22.5 % subsidy was provided in this scheme. The loan had to be repaid within three years at an interest of 12 %. The women fish venders purchase the containers, which are usually made of aluminum for keeping the fish and the raw material, ice etc. So far 600 women have been financed under this scheme. Data collected from 35 women respondents has been used for this study.

Family and Work profile

The fisher families in the Vaddy-Thangasherri region belong to the Christian community. The average age of the respondents was 49. Most of the respondents have been in the trade for several years. The average family size is six and an average of three members including the respondent, are engaged in some form of employment or other. Most of the male members are involved in fishing or allied activities.

The respondents are engaged in fish marketing for six days a week and take a break on Sunday. Important festive occasions are also non-work days. The respondents are all involved in fish based work and when not marketing, engage in other post harvest activities like salting and drying. The dry fish is generally marketed by the agents.

The respondents purchase fish for marketing from Vaddy-Thangasherri landing centre lying within a range of 0.5 to 2 km from their residences. Usually the women purchase one head load of fish that caters to the popular taste of their regular customers. The type of fish purchased also depends on the fish landed at

the landing centre. The most common species preferred are sardine, mackerel, seer, prawns etc. The women buy fish from wholesalers or form groups and directly bid during auction.

Seventy one per cent of the respondents are engaged in door-to-door marketing of fish. Only 29% of women vendors sell their fish in nearby markets. Sixty six per cent of the respondents reach their area of operation on foot and the rest use either public transport or a group of women hire an auto, the fare being shared, to reach a common point from where they disperse to their respective areas. When marketing is done door-to-door, the women cover an average of 36 houses every day. The respondents spent an average of 8 hours in the whole marketing process, from the purchase to the sale of fish.

Economics

MATSYAFED financed the initial requirements of the trade - the container to carry the fish and the raw material. It has also given the much needed impetus for the women to remain in the trade. The repayment capacity of the fisherwomen is high with all the respondents having repaid the loan within the stipulated period and no defaults being reported.

The respondents earned an average profit of Rs 44 per day. Profits in general ranged from Rs 40 to Rs 50. The profits accruing to the fish vendors were high when the day-to-day investment was high or when the fish purchased had high value like seer etc. The average family income per month was Rs. 2588 and that of the respondents Rs. 1063. The average percentage contribution of the respondents to the family income was 41 per cent. Two of the respondents were the only earning members in their family.

The auction agent also finances the daily purchase of fish. It is an informal arrangement with the loan being repaid the next day after the fish is sold. It usually draws an interest of 10%. Ninety one per cent of the respondents are dependent on this form of credit. An average expenditure of Rs 500 is incurred per day for fish and ice.

Problems faced

The women engaged in door-to-door fish marketing have to spend long hours on foot with head loads while the women in retail markets are forced to remain in a squatting position. This affects the general health of the women. Most of the respondents complained of pain in the legs, head and lower back. The infrastructural facilities in markets are generally poor and this adds to the inconvenience of the market vendors. They are also facing increasing competition from cycle vendors who have the advantage of greater mobility. However, the women form an important link in the marketing chain carrying the fish to the doorsteps of the consumer (Nikita Gopal *et al.*, 2000).

Though the respondents availed the benefit of an institutionalized credit scheme to begin the venture, their day-to-day business is still financed by loans from the informal sector. Only 9 % of the respondents have been able to re-invest their profits into the marketing process. The household situation does not permit the fisher families in developing a saving habit, since the incomes that the menfolk bring in are not regular or fixed.

Conclusion

The loan scheme by MATSYAFED has helped the fisherwomen from Vaddy-Thangasherri region to take up marketing of fish as a means of supplementing the family income in the face of fluctuating incomes of their menfolk from fishing. However, a majority of women are still dependent on the informal credit sector for financing their daily transactions. Therefore, there is a

need to develop a better alternative to cater to this need. The women can be organized into self-help groups to encourage the saving habit and to develop a corpus fund that can be used to meet their immediate financial requirements. Synergy is needed between credit, savings and marketing issues for the venture to be economically viable and sustainable (PHF News, 1997). Financial security and independence is often the first step towards empowerment of any section of society.

References

Anbarasan, Karuna, 1985. Factors that influence the role and status of fisherwomen, BOBP/WP/33.

DFID-PHFP, 1998. Small-scale fish marketing in Tamil Nadu - An alternate fish container for women petty fish traders, Information Bulletin 13.

Krishna Srinath, 1987. Role of women in small scale fisheries - A case study. Marine Fisheries Information Service, T & E Series, No. 72, pp: 12-17.

Nikita Gopal, V. Annamalai, M.P. Ramesan and Prem Kumar, 2000. Marketing efficiency of fresh fish trade in Cochin and Veraval (un published), CIFT.

PHF News, 1997. DFID-BOBP, p. 15.

Status of Women in Coastal Aquaculture Sector in India and Avenues for Gainful Entrepreneurship

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Introduction

With the increasing demand for shrimp as a major export commodity large areas were developed for coastal aquaculture in India. The simple tide-fed system of traditional aquaculture evolved into pump-fed systems with selective stocking of shrimp and higher stocking densities etc. Most of the aquaculture development has taken place in the states of Andhra Pradesh, West Bengal, Orissa, Kerala, Karnataka and Tamil Nadu. Presently 1,45,906 ha area has been developed for brackishwater aquaculture in India. 90% of the shrimp farms are in the small scale sector with holdings ranging in size from 2 – 5 ha. The need for diversification of species and culture practices is now increasingly being felt by the coastal aquaculture sector. The potential of fish culture in brackishwater system offers immense scope for development.

Women in traditional coastal fisheries in India

The Government of India estimated in 1996 that more than 5 million people living in the coastal areas are involved in fishing and allied activities for their livelihood. In traditional coastal fisheries both men and women participate in complementary activities. While men exclusively take part in fish capture operations, women are mainly responsible for performing on-shore jobs such as processing of fish catch, marketing, net making and mending. According to

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Kohli *et al.*, (1999), the participation of women in fisheries activities in the coastal states of Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu and Andhra Pradesh generally involves fish drying, fish processing, fish loading and unloading, retail marketing and net mending.

The percentage involvement of women in activities such as fish drying, fish transport, fish marketing, collection of prawn seed and net weaving/mending with respect to the brackishwater fisheries of Chilka Lake, Orissa, has been noted by Sharma & Thakur (1988). Mishra and Mishra (1998) reported that the main areas of participation of women in fisheries along Gopalpur coast of Orissa were fish handling, fish processing and fish marketing. In the Puri district of Orissa, women are engaged in the drying, curing and marketing of fishes from the marine catches (Rajyalakshmi & Pillai, 1988).

In West Bengal, fish/prawn seed collection is the major activity of women (Antony Raja, 1998). Anon (1994) reported that a large number of shrimp seed collectors operating in the Sundarban Islands were women. Vinci (1999) also reported that womenfolk in the coastal areas of West Bengal are mostly engaged in shrimp seed collection.

In north Andhra Pradesh, 39,972 fisherwomen in the coastal areas are involved in post-harvest shore-based activities like sun-drying and curing of low value fish, production of value-added fish products, fish vending and auctioning and collection of wild shrimp seed (Sujatha, 1999).

Women in the fishing villages of South Arcot district of Tamil Nadu are mainly involved in shore-based activities such as fish handling, processing and marketing (Crossan, 1993). Fisherwomen along the coast of Ramanathapuram district and Tuticorin in Tamil Nadu are engaged in fish processing, fish marketing and net mending (Rao *et al.*, 1998). Fisherwomen along the Ramanathapuram coast are also involved in the collection of agar-yielding red sea weeds such as *Gelidiella acerosa* and *Gracilaria edulis* (Surtida, 1998).

According to Kaladharan and Kaliaperumal (1999), 70% of the workers employed in seaweed collection and processing by the seaweed cottage industry in India, are women. In the coastal districts of Tamil Nadu, women are actively involved in the collection of bivalves and their marketing to ornament dealers and lime collectors (Shaleesha , 1997).

Along the south - east of India, several young women are employed by the pearl culture industry based at Tuticorin and Mandapam in Tamil Nadu and Visakhapatnam and Chirala in Andhra Pradesh, especially in skilled work involving nucleus implantation in the pearl oyster (Pillai, 2000).

Along the west coast in India, in Kerala, participation of women in fisheries mainly centres around activities such as fish/shrimp curing and drying, processing, transport and marketing; besides other activities such as fishing in backwater canals, collection of clam shells, collection of fish and shrimp by hand picking and shucking of cultured mussels (Krishna Srinath, 1987 & 1999). In Maharashtra, out of a fisherfolk population of 0.3 million, 50% are women, mainly engaged in fish processing and marketing (Tewari, 1999).

Role of women in traditional coastal aquaculture

The traditional practice of coastal aquaculture of fish/shrimp involves both men and women. While the men are predominantly engaged in activities such as construction / preparation of ponds and culture and harvest operations, the women are mostly engaged in seed collection, segregation and stocking, fish drying and curing and local marketing. The major role is played by men, whereas women folk participate in post – harvest operations and marketing of fish (Purushan, 1995). A recent survey of women's role in shrimp farming conducted by the Central Institute of Brackishwater Aquaculture (ICAR), in the east Godavari district of Andhra Pradesh, showed that womenfolk of nearby coastal villages participated in activities such as pond construction, seed collection and

segregation, de-weeding of pond, hand picking of shrimp during harvest and post-harvest activities like sorting and grading, de-heading and processing of shrimp. The above survey also indicated that women are able to get employment on the shrimp farms for 4 to 5 months in a year in addition to agricultural employment. However, the daily wages of women workers are less than that of men (Rs. 30-40/day for women as against Rs.80-100/ day for men).

Hoon & Shaleesha (1996) reported the percentage involvement of women in shrimp farming activities in the coastal districts of Tamil Nadu (Thanjavur, Pattukottai and Nagai Quaid-e-Millat) and Pondichery (Karaikal) as follows: collection of wild shrimp seed 82%; pond construction 26%, pond preparation 25%, monitoring of pond water quality 18%, harvesting 13% and post-harvest handling 14%. Gopalakrishnan (1996) reported that along the Tamil Nadu coast the women are engaged in collection of shrimp broodstock from trawl landings, wild shrimp seed collection, de-weeding of ponds, removal of clam shells from pond bottom, collection of molluscs and neried worms for feeding shrimp, preparation of pelletised feed, hand picking of shrimp during pond harvest and shrimp processing. Women constitute 40% of the labour force involved in shrimp farm construction activities in Tamil Nadu.

With the diversification to farming of other species of economic importance *e.g.* freshwater prawn, *Macrobrachium rosenbergii* (Scampi), along the east -coast of India, several rural women are employed in scampi farms as labourers and unskilled workers.

Small scale shrimp culture ventures by rural women

Shrimp culture by rural women in the Chilka Lake fringe area of Orissa has been reported by Rajyalakshmi & Pillai (1988), where many scheduled caste women who have been allotted small ponds by the Brackishwater Fish Farmers' Development Agency. Shrimp culture by rural women in small ponds and

homestead canals in the coastal regions of Kerala has also been reported by Gupta (1993).

Participation of women in emerging aquaculture enterprises

In some areas, women have taken up aquaculture based entrepreneurial ventures. For instance in Tamil Nadu, fisherwomen have taken up fattening of mud crabs, (*Scylla* spp.) (Kathirvel *et al.*, 2001).

Farming of the green mussel (*Perna viridis*) has been taken up by women entrepreneurs in northern Kerala (Pillai, 2000). Culture of algae (*Skeletonema and Chaetoceros sp.)* is another new occupation taken up by women in the Sirkali and Tranquebar districts of Tamil Nadu (Shaleesha,1998).

Avenues for gainful entrepreneurship for women in coastal aquaculture

It is clear that women's participation in coastal aquaculture has increased due to the rapid growth of shrimp farming. However, their role is secondary or subordinate to men mainly because of their illiteracy, social and cultural taboos and limited access to modern technology, credit and other facilities. There is an urgent need to focus on creating suitable occupations for rural women/ fisherwomen for increasing employment opportunities and to make them economically independent. Central Institute of Brackishwater Aquaculture, Chennai has developed technologies for backyard hatchery of tiger shrimp, *Penaeus monodon*; fattening of mud crab, *Scylla;* breeding of pearl spot, *Etroplus suratensis;* polyculture of sea bass, *Lates calcarifer;* integrated farming of shrimp/ fish with poultry which can easily be adopted by women entrepreneurs (Kerthrival *et al.*,1997; Lakshminarayna *et al.*, 1995; Mathew & Sultana, 1995; Thirunavukkarasu, 2000).

Conclusion

In order to ensure better participation of women in aquaculture development, it is desirable that an awareness is created about the available coastal aquaculture resources of our country. Conservation of mangrove resources needs to be especially emphasized. Promotion of small-scale, eco-friendly and sustainable aquaculture ventures, based on economically viable technologies developed by R & D Institutions, should be encouraged, for the benefit of women entrepreneurs, through effective extension programs. Recycling of wastes should be advocated through integrated farming and organic farming ventures. Emphasis should also be laid on polyculture and alternate cropping practices.

References

Anon., 1994. Overall Report on Integrated Rural Development Program-Karaikal phase 5 (July'92 and June'94). Rural Development Wing. Sri Ramakrishna Ashram. Nimith. West Bengal.

Antony Raja, B.T.,1998. Women in marine fisheries: Experience of Bay of Bengal Programme. In: Proc. Intl. Conf. on Appropriate Agricultural Technologies for Farm Women, New Delhi, 30 November-6 December, 1998, pp 1-16(mimeograph).

Crossan, Ruth, 1993.The container that's become a symbol. Bay of Bengal News. No. 50:22-25.

Gopalakrishnan, A., 1996.Role of women in Indian shrimp farming. Naga, the ICLARM quarterly.19(4):16-18.

Gupta, Jancy, 1993. Scientific prawn culture in homesteads – a gainful self - employment opportunity for coastal women. Indian Farming : 25-27.

Hoon, Vineetha and A. Shaleesha, 1996. Women's role in shrimp farming-technology needs and mechanisms for transfer of technology. In: Proc. Natl. Workshop on Transfer of Technology for Sustainable Shrimp farming, Chennai, (Ed.) K. Alagarswami, pp 63-68.

Kaladharan, P. and N. Kalaiperumal, 1999. The Seaweed industry in India. Naga the ICLARM quarterly, 22(1).

Kathirvel, M., S. Srinivasagam, P. K. Ghosh and C.P. Balasubramanian, 1997. Mud Crab culture. CIBA Bull.,10:1-4.

Kathirvel, M., S. Srinivasagam & S. Kulasekarapandian, 1999. Experimental trial on fattening of mud crabs. CIBA News,4(2):1-2.

Kohli, M. P. S., K. Sunita and K. Meitileima, 1999. Extent of participation of women in Indian fisheries sector. Indian Soc. Fish. Prof., 1(1):5-6.

Krishna Srinath, 1987. Role of women in small-scale fisheries-a case study. Mar. Fish. Infor. Serv. T&E Ser.,No.72:12-17.

Krishna Srinath, 1999. Activities of women in fisheries- Kerala and Tamil Nadu. Indian Soc. Fish. Prof., 1(1):7.

Laxminarayana, A., S. M. Pillai, K. K. Surendran and C.S.Sridharan,1995. Backyard hatchery technology for the white prawn, *Penaeus indicus*. CIBA Bull., 8:1-7.

Mathew Abraham and Munawar Sultana, 1995. Methodology for seed production. In: Biology, fishery, culture and seed production of the pearl spot, *Etroplus suratensis* (Bloch).CIBA Bull.,7:40-45.

Mishra, B.P and R. Mishra, 1998. Role of women in fish processing and marketing along the Gopalpur coast of Orissa. In: Current and emerging trends in aquaculture.(Ed.) P. C. Thomas, New Delhi, pp.337-339.

Pillai, V. N., 2000. Bivalve mariculture in India.(Ed)V. N. Pillai. Asia-Pacific Association of Agricultural Research Institutions, FAO Regional Office for Asia and the pacific, Bangkok, pp. 1-56.

Purushan, K. S., 1995. Role of women in shrimp farming. Fishing Chimes. 13-14.

Rajyalakshmi, T. and S. M. Pillai, 1988. Involvement of women in gainful employment in fisheries field – a study at Puri area. In : Proc. All India Workshop On Gainful Employment for Women in Fisheries Field, Cochin, pp. 117-*122.*

Rao, M. Jaganatha, P. V. David and T. Shanmugaraj, 1998. Community-based marine resources management in the Gulf Of Mannar bioshpere reserve. Bay of Bengal News.2(10):25-27.

Shaleesha, A. 1997. Coastal fisher worker's resource dependency and women's role in aqualculture. J. Beyond Anubhav, (1):40-42.

Shaleesha, A., 1998. Dimensions of algal impact in aqualculture. SRU-Seaweed Research and Utilization, 20:75-79.

Sharma, B.K. and N. K. Thakur, 1988. Participation of women in fisheries activities in Orissa- a case study. In: Proc. Intl. Conf. on appropriate aquacultural technologies for farm women, New Delhi, 30 November-6 December1998, pp 1-20(mimeograph).

Sujatha, K., 1999. Vishkapatnam coast: Contribution of fisher women in post-fish harvest handling. Fishing Chimes, 19(2): 28-32.

Surtida, M. B., 1998. Village level processing technologies. SEAFDEC Asian Aquaculture .20(1).

Thirunavukkarasu, A. R., 2000. Seabass *(Lates calcarifer)* seed production. CIBA Extn. Ser., 20:1-9.

Tewari, R., 1999. Coastal fisherwomen of Maharashtra: their role and status. Indian Soc. Fish. Prof., 1(1): 9.

Vinci, G. K., 1999. Women in fisheries in West Bengal. *Indian Soc. Fish. Prof.*, 1(1): 8.

Backyard Ornamental Fish Culture by Women in Chennai (Tamilnadu)

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Introduction

Ornamental fish keeping is one of the most popular hobbies in the world today. It cherishes and relaxes the troubled mind. The global value of this industry is estimated around US $4 billion. Over US $500 million worth of ornamental fish are imported into USA each year. Germany's import is approximately valued at US $100 million per year. Singapore is the world's largest exporter of tropical fish valued at US $40-50 million. Other exporting countries are Hong Kong, Thailand, Malaysia, Philippines, Srilanka and Indonesia. India's share in ornamental fish trade is estimated to be US$0.1million. However it may be possible for India to capture at least 10% of the present market utilising its vast indigenous stock of germplasm and unemployed and trained manpower, especially the women in the rural and urban slum sectors. Considering the relatively simple technique involved and not a high investment commitment, this activity has shown results and has the potential to create substantial job opportunities besides helping export earnings.

Background

The MS Swaminthan Research Foundation, Chennai undertook a project on ornamental fish breeding involving rural women in 1995. The project was monitored in term of biological survival and economic success for a period of four years and reviewed by means of' Stochastic' sensitivity analysis.

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Description of facilities provided by MSSRF

Each women was allotted three cement tanks each of 0.5 ton water holding capacity and also provided with the breeders, a fish catch hand net, a plastic water exchange siphon, prophylactic medicines and supplementary pellet feed. A data entry book was prepared in their dialectal language for recording information on the feed used, method and frequency of feeding, water exchange particulars, growth rate, fecundity, mortality, hatching rate, marketing particulars and the time spent by each women in each activity, per day towards management. After several hand-on training programs, the women, confident of themselves started managing and gradually marketing also. The evaluation of this program is based on both biological and economic factors.

Economics

The feed accounts for 30% of total production expenses in this enterprise, hence it should be taken as a primary factor as the costs are often changing. Another important factor in this enterprise is the *'selling price'* of ornamental fishes.

Investment

Total investment in this backyard fish breeding and marketing enterprise is about Rs.3000 per unit. The cost of the infrastructures such as concrete cement tanks, equipment such as siphoning hose, nets, etc., accounts for 70% of the investment costs.

Operating costs such as feed, breeders etc., are 30% of the investment cost. To start up, cost represents all the entire facility set up and the unit functional prior to the marketing.

Table 1. Investment costs for one unit of small scale ornamental fish culture

	Category	Amount (Rs.)	(%)
1	Concrete tanks	1800.00	60
2	Equipment's (siphon, net etc.)	150.00	5
3	covers	110.00	3.6
4	feed	150.00	5
5	seed	240.00	8
6	water intake - labour	250.00	8.4
7	management - labour	300.00	10
[1] One unit accounts to three culture tanks			

Conclusion

The backyard small- scale ornamental fish culture enterprise is relatively stable. Even with 50 % equity financing and poor management conditions, it has still 98 % chance of survival but no chance of economic success. This stability is due to more than one number of culture tank which prevent risk and the fact that breeding takes place once in two months. There are several conditions where the chance of economic success is 100 %. An investor must calculate the required rate of return as against the management capabilities and ability to take a risk to decide taking up this venture. Though practice of ornamental fish culture is claimed to be a lucrative business, the fish species are not immune to the effects of poor management and may lead to mass mortality. Small farmers in remote villages are economically rational and generally willing to adopt innovations that they consider economically advantageous. According to women, an enterprise like this backyard ornamental fish culture etc., do not add to their drudgery

because as it is convenient to operate. Due to inadequate family income farmers can not afford to take risks. The returns on innovation should be high to offset risk associated with its adoption and the extra labour required. Recognising this, the objective of any rural development (or) small- scale project must be defined by the specific needs of farmers within the circumstances, in which they live and work. Any viable technology package designed for the small farmers should include on-hand demonstrations and training, economic information and techniques of management.

Women Fish Traders of Chilika- Prospects and Problems

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Introduction

Sprawling along the east - coast, Chilika is the largest brackish water lagoon of the country. Situated between 19°28′ and 19°54′ N latitude and 85°05′ and 85°38′ E longitude, it extends from south west corner of Puri and Khurda district to the adjoining Ganjam district of Orissa State. It has a water spread area of maximum 1165 km^2 (during monsoon) and minimum 740 km^2 (during summer). Chilika is known to be a hot spot of bio-diversity. It abodes over 800 species of fauna including 225 varieties of fish and supports a variety of algae and aquatic plants. It is also a destination for a number of migratory birds.

Besides its ecological importance, Chilika, over the years has greatly affected the socio-economic life of the people around it with its highly productive eco-system and rich fishery resources. There are 132 villages around Chilika. There are 12,363 traditional fishermen families inhabiting the area, besides other communities. About 100,000 fisherfolk derive their livelihood from Chilika with virtually no alternate source of livelihood. Most of these families are landless and a few are having marginal land holdings. A close observation of their life, health and sanitation speaks of their poor state of development, more conspicuous being the plight of elderly women.

Activity profile of men and women give the clear impression that while fishing in Chilika with country made boats is the exclusive domain of menfolk, for women it is small scale fish trading. Changes in and around Chilika have

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made women's involvement in fish trading more conspicuous economically imperative. Ignoring the risks to health and bearing all the stress and strain these women seem to have embarked on a long journey of earning a daily livelihood for their families. A study was undertaken to look at various facets of women's involvement in fish trading. Out of 50, four landing centres in the North-western side of Chilika were selected randomly namely Soran, Nairi, Balugaon and Pathara. Fifteen women fish traders from each landing centre were randomly selected. Data were collected through semi-structured interview schedules developed for the purpose.

Socio-economics status of women fish traders

Participation of women in fish trading depends to a large extent on personal factors as also family conditions. Women of different age groups were involved in this activity. While the highest participation (33.33%) was seen in the age group of 40-50 years and lowest (8.33%) was found in age group less than 30 years. About one-third of the respondents were above 50 years of age, which indicates that women of older age group also participated in fish trading activity (Table 1).

The women belonged to sub-castes Keot, Kandra, Nolia, Khatia, Tiar, Niali, Gokha etc. Keot and Kandra were the two dominant sub-castes of which relatively more women were involved in this vocation. Status of women was low, about two-thirds of women being illiterate. The highest level of education amongst women being primary passed. As far as the economic status concerned, 76.66% of women were landless and rest had marginal land holdings.

Table1. Socio-economic status of women fish traders

Parameters	Classes	f (n=60)	Percentage
Age	Less than 30 years	5	8.33
	30 – 40 years	13	21.66
	40 – 50 years	20	33.33
	50 – 60 years	14	23.34
	60 years and above	8	13.34
Sub-caste	Kandara	16	26.66
	Keota	32	53.33
	Other sub-castes	12	20.00
Education	Illiterate	41	68.33
	Can read and write	12	20.00
	Primary	7	11.67
Landed property	Landless	46	76.66
	Marginal	14	23.34
No. of children below 5 years	Nil	45	75.00
	One child	7	11.66
	Two children	8	13.34
Husband's income status	Dead	16	26.66
	Idle	15	25.00
	Fishing	24	40.00
	Marketing	5	8.34
Association with developmental agencies	No association	30	50.00
	Mini Bank	16	26.66
	Panchayat Samiti (Anganwadi	8	13.33
	NGOs	15	25.00

The two factors that seem to greatly affect women's involvement in fish trading were number of children below five years and husband's income status. About 75% of the fish traders didn't have any children below 5 years, which relieved them of child- care worries. About one-fourth of the women though had children below five years but were compelled to get involved in fish trading for

survival of their families. Husband's income was another factor that seemed to be important in explaining, to a large degree, women's involvement in this economic activity. It was observed that in case of 26.66% of women, their husbands were dead and in case of 25% of fish trading women, their husbands were idle with no contribution to family income. This indicates that about 51.66% of women have assumed the role of feeding their families in the absence of any contribution from their husbands/male members. Many of the idle husbands were known to be addicted to alcoholism. Severe decline in catches from Chilika is also a reason while some male members have become jobless. In case of 48.34% of women, husbands were found to be contributing to family income. Thus, men and women play supplementing role in maintaining their families. While husbands of 8.34% of these women were involved in fish trading, in case of 40% of women, their husbands/male members were engaged in fishing in Chilika.

Association of women with different development agencies / department is a key factor for capacity building .The study revealed that about half the women had no contact with any development agency, whereas about one-third had availed loans from mini banks. Further investigations revealed that they were not satisfied with the benefits they were getting as the terms and conditions of the banks and schedule of repayment did not suit them. Even though 25% of these women had some kind of association with NGOs, many of them were skeptical about the benefits/help from NGOs. Only 13.33% of women who had an association with Anganwadis (through Panchayat Samiti) seemed to have benefited.

Nature and extent of fish trading

Types of fishes:

Women involved in fish trading sold fishes either fresh or dried. However, depending on convenience and financial exigencies, they often

combined the two. It was observed (Table-2) that about 35% of women sold fresh fish about 7% sold dry fish and 58.34% both in dry and fresh fish. About 25% women sold fish seed alongwith fish. Women of "Keot" sub-caste were more inclined towards trading in fresh fish whereas women from "Kandra" sub-caste seemed to sell both dry and fresh fish.

Table 2. Type of fishes sold by women

Type of fishes	Frequency (f) n=60	Percentage
Fresh only	21	35.00
Dry only	4	6.66
Both fresh and dry	35	58.34
Fish seeds with fishes	15	25.00

About 15% women procured fish from their own family fishers. Majority of the women (60%) were involved in door to door marketing of fish, about 15% preferring road side marketing. It was interesting to note that about one-fourth of the respondents acted as middlemen.

Hardships that women bear during fish trading can be gauged from the fact that they cover long distance during a day with head loads of fish. The data revealed that 28.34% women moved on foot while the rest had to combine walking with other means of transport like buses, trains or rickshaws. The average distance traveled by women on foot was about 18 km per day. They traveled upto 132.4 km if using trains. Some women particularly from sub-caste "Kandra" go for trading for couple of days continuously from village to village.

Table 3. Means and distance of travel

Sl. No.	Means of travel	Frequency (f) (n=60)	Percentage	Avg. distance traveled in kms.
1.	Foot only	17	28.34	17.76
2.	Foot + Bus	20	33.34	60.25
3.	Foot + Train	19	31.66	132.42
4.	Foot + Cycle Auto rickshaw	4	6.66	16.50

Bamboo baskets of different sizes and capacities are used. Most common was bamboo-baskets of somewhat semi-spherical shape with a fish holding capacity of 20 kg. Fresh fishes are packed with ice in the evening and are marketed in the morning. Bigger size baskets are used for supplying the fishes to middle- men or carrying to distant markets.

About 16.66% women traded fish for more than 240 days, while one-fourth did so for about 180-240 days in a year (Table 4).

Table 4. Approximate number of days given to trading in a year

Sl. No.	Days in the preceding year	Frequency 'f' (n=60)	Percentage
1.	Less than 120 days	2	3.34
2.	120-180 days	10	16.66
3.	180-240 days	14	23.34
4.	240 and more days	34	56.66

Reasons of fish trading

As revealed by data in Table 5, the main reason for women taking up fish trade was to follow the family/ caste traditions. Meeting the basic needs of the family; overcoming the problem arising out of husband's death, addiction and

idling; supplementing family income etc. were the reasons for women to work.

Table 5. Reasons of fish trading by women

Sl. No.	Reasons	Strong agreement 'f'	Mode rately agreeme nt 'f'	Little agreem ent 'f'	Not a reason 'f'	Total weighted score	Mean Score	Rank
1.	Family/caste tradition	20	40	-	-	140	2.33	I
2.	Lone opportunity left for women	-	30	5	25	65	1.08	V
3.	Supplementing family income	20	5	-	35	70	1.16	IV
4.	For basic survival of the family	40	3	2	15	128	2.13	II
5.	Helping the men folk of the family in fishery	-	-	5	55	5	0.08	VIII
6.	To overcome the problems arising out of husbands death, addiction and idle character	28	-	-	22	84	1.40	III
7.	To repay the debts	-	15	20	25	50	0.83	VI
8.	To purchase household assets	-	8	12	40	28	0.46	VII

Hazards in fish trading

Altogether 10 different kinds of job hazards were found associated with fish trading by women during pilot study with varying intensity. The intensity of each hazard as perceived by the women traders on a six point scale is presented in Table 6. The hazards in descending order as found out were excessive body pain, head reeling, little or no food during journey, cooking and child care after

returning from trade, insult from outsiders, fever, cough, cold and stomach pain, skin diseases, fowl smell, unsafe shelter and accidents.

Table 6. Hazards in fish trading as perceived by fisher women

Sl. No.	Type of hazards	Frequency of facing (n = 60)						Total weighted score	Mean score	Rank
		In all days of sale	Once in a week	Once in fort night	Once in a month	Once in six months	Not faced			
1.	Excessive body pain/physical stress	56	4	-	-	-	-	296	4.93	I
2.	Cooking and child care after returning from trade	21	-	-	-	-	39	105	11.75	IV
3.	Head reeling	30	4	4	5	-	17	193	3.21	II
4.	Fowl smell	3	5	-	-	-	52	35	0.58	VIII
5.	Fever, cough, cold and stomach pain	-	5	-	20	8	27	68	1.13	VI
6.	Accidents	-	-	-	-	15	45	15	0.25	X
7.	Skin diseases	10	-	-	-	-	50	50	1.00	VII
8.	Little or no food during trading	10	12	6	-	-	22	116	1.93	III
9.	Unsafe shelter	-	-	-	10	-	50	20	0.33	IX

Investment and profit from fish trading

Majority of the women sold up to 100 kg fish per week, only in 10% of the cases the volume exceeded 150 kg. Of the different species traded by women important ones were *Stolepharous Indicus/Thryssa purava* (local name – Patua), *Etroplus suratencis* (local name – Kundala), *Mystus gulio* (local name – Kantia) *Dentrophysa russeli/Daysciaena albida* (locale name – Borog), *Plotosus canius* (local name – Kaunda). Important prawn species traded by women were *Metapenacus dobsoni* (local name – Panu), *Metapenacus monocanus* (local name – Marada) and *Penacus indicus* (local name Kantala).

Taking into consideration the return from fish trading and incidental expenses incurred in the process, approximate profits/net income per week was estimated. About 45% of women earned a profit of less than Rs. 250, 35% between Rs. 250 and 500, 11.66% between Rs.500/- and Rs. 750/- and only 8.33% women managed a profit of Rs. 750 or more. Profit level of women are found to be influenced by the volume of sale and fish composition (which determines price of fish).

About 70% of women traders invested less than Rs. 2500 per week in fish trade, majority of them procuring the capital from non-institutionalised sources like 'bahanis' or money lenders. In practice most of the women get the required quantity of fish from desired sources either from 'Bahanis' (fishermen on boat returning from fishing) or fish godowns on credit. Next day, they pay back the due amount and take the required quantity of fish on credit. Hence, it is a "*take fish in credit and pay when purchasing next*" principle. This arrangement keeps both sides going. Sometimes, women resort to borrowing from local moneylenders. Some women are found to avail both institutional and non-institutional source of finance for trade.

Table 7. Weekly working capital and sources of capital

Source / Working Capital (Rs)	Credit from fish godown/Bahani 'f'	Borrowing from money lenders 'f'	Both institutional and money lender 'f'	Total 'f'
Less than 2500	20 (33.33)	14 (23.33)	8 (13.33)	42 (70.00)
2500 - 5000	4(6.66)	6 (10.00)	2 (3.33)	12 (20.00)
5000 – 7500	2 (3.33)	2 (3.33)	-	4 (6.66)
7500 or more	-	2 (3.33)	-	2 (3.34)
Total	26 (43.34)	24 (40.00)	10 (16.66)	60 (100.00)
Figures in parentheses (-) indicate percentages.				

Socio-Economic Status of Fisherwomen of Peri-Urban Areas of Calcutta (West Bengal)

*Madhumita Mukherjee, Rajarshi Banerjee, * Arindam Datta & Soma Sen*

Introduction

Peri-urban areas reflect an area in which the city and the village blend forming a twilight zone in between. Calcutta, truly a metropolitan city specifically bears as large peri-urban area in its surroundings. It is unique in the sense that almost the whole city sewage is brought in through canals that enter the pockets of these peri-urban area. The city sewage undergoes bio-treatment through production of profitable protein & environmental purification along with employment generation. In the peri-urban area about 3500 ha are covered by sewage fed fisheries & vegetable production, aquarium fish culture, flori-culture, brackish water fish culture etc. The present study is an attempt to examine the occupation, occupational hazards and socio economic status of fisherwomen in the three different systems of peri-urban system of Calcutta , Sardarpara – a tribal village located in North 24 Parganas, Udayrampore – a cosmopolitan village of South 24 Parganas and Mudiali.

The status of women in the world has gone up considerably since the World War II but the place of women in the society still leaves much to be desired. Women constitute 50% of world population; they perform 70% of world's works, earn 10% of the world's income and own only 1% of the world's property. In ancient India there are reports of women being sharing equal rights with men in terms of morality, idealism, occupation, matrimonial ceremony,

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placement in society, purity of body and soul, divorce and sharing of property etc. In Bengal women actively participate in a number of income generating activities for their families. The present project was undertaken to develop and understand the trends in fishery development and their implication for peri-urban fishing community of Calcutta and to make visible women's role in fisheries and in fishing community of this place so as to reflect strategy to strengthen their meaningful participation. It also intends to cover social habits and hazards of women fishers. Data was collected through interviews and group discussions. Besides, health surveys were also carried out by holding medical camps.

Case Study I- Sardarpara Village

Village Sardarpara is situated in Salt Lake Municipality and has 35 families belonging to the fisherman group. There is low participation of womenfolk in economic activities because of low literacy, daily and seasonal household & occupational workload, cultural and social taboos etc. Traditionally a Bengali house lady would not like their men to do house hold jobs. Activities like cropping and gardening, collecting the fire- wood from distant places are also performed by women. Their other activities are raising cattle, pigs, chicken and grazing these animals in the field. Girls in Sardarpara prefer to do embroidery, reading, studying rather than doing compulsory household activities.

Despite their tremendous workload fisherwomen get scanty reward and recognition. Due to lack of educational opportunities their potential is not fully utilised. They also lack access to finance. Their status is further lowered by their differential treatment during socialization, poor exposure to modern technology, ineffective motivation and secondary status in decision making within family etc.

Case Study 2- Udayrampur Village

The women in this area showed a greater participation in income generating activities. They performed task that mainly include cleaning tanks, fish rearing, collecting fish feed, rabbit culture, live stock raising, vegetable gardening, working in household etc. Occupational hazards reported from this village are occurrences of common skin diseases, intestinal worm and danger of snakebite. Fish diseases, lack of indigenous technical knowledge, lack of investment funds etc. are the major constraints in increasing fish production. However, the fisherfolk confessed that their economic situation had improved (access to good protein rich food, improved accommodation and possibility for their children to go to school) through increased income from ornamental fish culture and establishment of co-operative society which also include female members.

The women in this village have a better participation in fisheries activities which may be due to the fact that they had a higher literacy rate, economically more independent, did not strictly follow social taboos and had an advantage of city as well as village life.

Case Study 3- Mudiali Village

In Mudiali Nature Park there is amalgamation of aquaculture, nature park and eco-tourism on the very heart of the city. This has resulted in improving the economy of the local people. Here ladies participate as:

1. Daily laborers in Metiaburuz which is having a large market of tailoring, readymade garments
2. Take care of animals like deer
3. Work as maid -servants

Occupational hazards of women in Mudiali include:

1) Backache due to overstrain in tailoring occupation

2) Eye-sight problem due to continuos needle work

3) Being situated nearer the city is affected by pollution and consequences thereof

Social status of women

The fisherwomen, especially in rural areas have remained backward for long due to socio-economic constraints. These constrains are illiteracy, traditional values and norms, dominant positions of menfolk, superstition, economic dependence on men, social evils like dowry and polygamy, low work participation and discrimination. Though women have been denied equal opportunities for personal growth and social development all over the world, the situation in India is worse because of the sex segregated characters of society, poverty and traditional values (Giriappa, 1994). The status role of fisherwomen is different from that of other women due to a different social stratification in their surrounding areas. Among the women respondents engaged in fishing 80% were full and 20% were part timers. Majority had education upto primary level and many were literate. Only one girl was graduate. Diversification of employment opportunities and specialised skill development are needed for women fishers.

Conclusion

The women of Udayarampur village seem to be having a higher socio-economic status, access to fuel- wood, market and the daily diet, etc. alcoholism and wife beating are the common problems faced by women. Lack of electricity, poor housing and insufficient income are the other problems. The main areas of focus should be:

- Primary education be made compulsory
- A secondary educational and adult education center may be provided
- A permanent health center with emergency facilities to cater the basic medical

needs of the community be provided

- Awareness camps against ill effects for various social evils be arranged from time to time

An integrated project management, infrastructure facilities development would help the fishermen to raise their socio-economic status particularly that of women.

References

Giriappa, S., 1994. Role of Fisheries in rural development. Daya Publishing House, Delhi.

Women in Aquaculture in the Hilly Region of Darjeeling in West Bengal

Bidhan C. Patra, Partha Bandyopadhyay, Abhijit Kar & Satyajit K. Sarkar*

Introduction

Although women have proved to be competent in adopting new aquaculture techniques, their role is very much restricted and often ignored, but in the hilly region of Darjeeling in West Bengal, the rural women upgraded their skills in aquaculture. In this region women's involvement in aquaculture, integrated with animal husbandry is predominantly about 80%, starting from seed collection to marketing. Traditionally they cultivate exotic carps and made an important contribution to the rural economy of the area. A large number of poor women are engaged in aquaculture and sustain their families with their income. They use cow, pig, poultry, goat, tea garden waste as manure and also feed the fishes with supplementary feed, aquatic and terrestrial weeds etc. They are also engaged in catching of fish and marketing it in the nearby markets.

Fish Farmer's Development Agency (FFDA), Darjeeling gave financial support to the women. Short and long-term loans with least amount of interest, and subsidies for buying the PVC pipes and pumps for collecting water from 'Jhora', 'Rangeet' streams is provided. Generally, they prepared small rectangular ponds (of about 0.0032-0.0038 ha area). The women were assisted by their menfolk in pond preparation. 'Jhora' fisheries is specific to Darjeeling hills, stream and spring waters are diverted to small ponds with running water type situation.

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The Siliguri station of the Department of Fisheries, Government of West Bengal, supplied the seed of exotic carps at the rate of Rs. 400/-per 10,000 seeds to women. They also collected seed from local dealers.

Culture practices

Earlier, they were cultivating only exotic carps but now they have included Indian major carps along with exotic carps. The stocking density is maintained @ of 20,000 fingerlings/ ha with an average weight of 2-3 g and length of 3-5 cm. Catla, rohu, mrigal, grass carp, common carp and silver carp are stocked in the ratio of 2:1:2:1.5:0.5:2:1.

The management system of culturing carps has three aspects namely in water supply, manuring and feeding.

a) Manuring: They are only using organic manures like cow and pig dung, goat and poultry droplets and tea garden waste. This resulted in reducing the cost of the enterprise. They are now using the mixture of cow dung: pig dung: poultry manure: tea garden waste in the ratio of 1:1:1:1 in installments.

b) Feeding: The earlier practice of using aquatic and terrestrial weeds as a feed for grass carp (*Ctenopharyngodon idella*) has now be replaced with feeds prepared with mustard oil cake and rice bran.

c) Water supply: They used water from 'Jhora' and 'Rangeet" streams with the help of PVC pipes to refill their ponds when the depth of water decreased.

d) Culture period : The culture period for Indian major carps was between 6 to 9 months (March to November), but exotic carps were cultured throughout the year. Amongst the cultured species the highest growth recorded in the fish ponds in one year was in case of grass carp (1 kg-1.250 kg) and lowest in goldfish (150-200 g) while catla attained 600 g in 9 months.

Periodic sampling and final harvesting is done by the women them selves. Small dragnets are generally used for catching fish. The exotic carps are sold in local fish markets at Rs 40 / kg and Indian carps at Rs 60/ kg by women. The goldfish are sold at the site itself at Rs. 5/pair to Rs. 100/pair depending on the size. The women thus supplemented their family income considerably, earning Rs. 400-500 per month. The hill women can be supported by various governemental schemes, viz. training, easy finance, supply of seed and feed at subsidised rates so that they can improve fish production from these 'jhoras'.

The Women Piscicultural Organization of Manipur, 'Nupi Nagayok Marup'- A Case Study

*Sunita Kangabam[1] & M.P.Singh Kohli**

Introduction

Manipur is situated in the north-eastern part of India between 23°83' to 25°68' N latitude and 93°03' to 94°78'E longitude with an altitude varying from 790 m to 2425 m msl. The state has a total water area of about 0.1 million hectare (Anon, 1987). Fish fauna comprises altogether 156 species including the catfishes, minor carps, mahaseer, feather back, murrels, anabantids, eels, etc. The total fish production of the state onwards to 12000 t per annum. In all there are 123 fishing villages with 25,806 fishermen, out of which only 13,277 fisherman are engaged in active fishing. The fishermen of Manipur are socially and economically backward, live in isolated places which lack public amenities.

The fisheries activities can be classified into two major categories (a) harvesting and (b) post-harvesting. In the first activity the participation of women in India is generally very limited, however in some parts of the country, especially in north-eastern States of Assam and Manipur women are engaged in fishing activities especially in flood plains, marginal areas of canals and rivers and lakes (Singh, 1995). Thus fisherwomen constitute significant part of working women in Manipur, this necessitates understanding of their role. However, so far no serious efforts have been made to study the socio-economic conditions of women fishing community. A study was taken up to evaluate functioning of the scheme 'Nupi Nagayok Marup' in Manipur.

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Marketing of fish in Manipur

Due to lack of infrastructure facilities, marketing system of fish is still in traditional way in Manipur. There is no separate market for fish but it is a part of general market complex.

The fish market is run mostly by women since ages. The main market is at Imphal, where fish from different terminal fish markets arrive. Most of the fish sold in terminal markets are brought by the producer's own family or women fish dealers by head load or by boats. The selling pattern in these markets is like whole sale markets. The whole load of fish is to be purchased at a time by negotiations. The buyers in these markets are generally women fish dealers, locally called as "Unjha". The marketing hours vary from market to market. The peak period is generally 8 a.m. to 11 a.m. and 4 p.m. to 8 p.m. (Singh, S.D., 1978; Singh, A. K., 1996).

Fish sale system in Manipur

Small varieties of fishes of both dry and fresh are sold in small units of baskets of varying sizes known as 'Luk'. Now a days it is sold on weight basis also. The prices are fixed by negotiations and bargaining between the buyers and sellers. The mode of movement of fish within the State is shown in following flow diagram:

Flow diagram of local fish marketing in Manipur

Producers at landing centres

Village markets at landing centres

(through fishermen family and women fish dealers)

'Unjahs' (women fish dealers) at terminal markets

Retailers at the main central market

Consumers

Women piscicultural osrganization(Nupi Ngayok Marup)

During the sixth five year plan (1980-85) the Department of Fisheries, Govt. of Manipur, implemented under the Plan Scheme, the Women Piscicultural Organization (Nupi Ngayok Marup) to popularise the fish farming in the State and to help empowerment of women and involving the women in the mainstream of social fabric of Manipur society. The objectives of the society were:

(a) To render service for the welfare of the members and non-members of the society especially for women in general .

(b) To take up and maintain composite fish culture in the existing fish ponds owned by the members of the society and in the public ponds situated in the locality.

(c) To educate women to get the knowledge in a modern scientific way of fish culture practices and fish net making techniques.

(d) To arrange periodical lectures/discussion/demonstrations to impart knowledge on the modern piscicultural techniques.

(e) To render welfare services to the people by providing fish, thereby substituting protein deficiency of the expectant mothers and children.

(f) To raise funds by receiving donations, subscriptions etc. from members, public and financial assistance from government and other local bodies.

Almost every household in Manipur whether in the urban or rural area has a backyard pond, which ranges from 100 to 1000 m^2. In addition to these ponds at a number of low-lying places water accumulates during rainy season, which are also used for aquaculture either individually or under group ownership . To encourage women to undertake fish culture in these water bodies the Directorate of Fisheries, Govt. of Manipur launched 'Nupi Ngayok Marup' (Women Piscicultural Organization) in 1983.

There are altogether 609 numbers of the 'Nupi Ngayok Marup' in the state of Manipur. Since its inception 40, 61, 240 carp fingerlings have been distributed and stocked in the ponds of the members (Table 1). Besides fish seeds, fish nets, and other accessories were also supplied.

Table 1. Progress of Nupi Ngayok Marup from 1983 to 1989

Sl.N.	Districts of Manipur	No.of Nupi Ngayok Marup	No. of fingerlings supplied.
1.	Imphal	303	26,07,395
2.	Tamenglong	12	5,000
3.	Jiribam	5	7,500
4.	Ukkrul	54	1,78,200
5.	Chandel	50	86,000
6.	Churchandpur	25	-
7.	Thoubal	56	1,80,297
8.	Senapati	2	-
9.	Bishavpur	102	9,96,848
Total			40,61,240

(Source: Anon., 1989)

Under 'Nupi Ngayok Marup' each cooperative society consists of 7-20 members. The pond size generally ranges between 100 to 1000m^2 with the average depth of 1 m. Before the onset of monsoon, liming is done in these ponds. Since these ponds are generally backyard multipurpose ponds, very low dose of organic manure is given. After ponds were filled with rain water they were stocked with the fingerlings of rohu, calta, mrigal, grass carp, silver carp and common carp. Kitchen waste is given as supplementary feed. Production of about 30-50 kg was generally obtained per pond in culture period of 6-12 months.

Some of the enterprising women pisciculturists after gaining the initial experience from these small scale farming, adopted full fledged fish farming practices on commercial scale by acquiring land in the rural areas for production of table size fish and fish seed production.

Economics

It is heartening to see the success achieved by Smt. S. Ekashini Devi (Case

study 1). On the days when the partial harvesting is done, the women fish retail sellers come to the farm site and collect the fishes for selling in the retail market by travelling at least 10-15 km both ways. Salient economic features of two case studies selected are presented in Table 2.

Table 2. Salient features of two women fish farmers of Manipur

Sl. No.		Case 1	Case 2
1	Area of farm	6 ha	2 ha
2	Cost of pond preparation/maintenance	Rs.30,000/-	Rs.20,000/-
3.	Cost of fish seed	Self produced	Rs.18,750/-
4.	Cost of manuring raw cattle dung, mustard oil cake	Rs.31,500/- Rs. 13,500/-	Rs. 9,900/- Rs. 3,780/-
5.	Cost of fertilizers SSP	Rs. 13,500/-	Rs. 3,780/-
6.	Cost of lime	Rs.10,350/-	Rs.25,880/-
7.	Cost of artificial feeding rice bran mustard oil cake	Rs,7,500/-	Rs. 9,450/-
8.	Cost of harvesting	Rs.5,000/-	Rs.3,000/-
9.	Other expenditure	Rs.72,000/-	Rs.15,000/-
10.	Income from sale of fish	7,20,000/-	Rs. 1,44,000/-
11.	Profit	Rs.4,96,900/-	Rs.60,340/-

Case Study 1 : Farm of Smt. S.Ekashini Devi
Case Study 2 : Farm of Smt. O. Taruni Devi

Conclusion

Since its inception the scheme could not attain the desired results. The scheme is almost defunct but these homestead ponds remained under aquaculture mostly managed by women and family members. Some of the enterprising women like Mrs. Ekashini Devi have adopted fish farming on large scale gaining initial experiences in their homestead ponds. The scheme need to be revived by the Department of Fisheries with the assistance of Central Government, NCDC

and Small Farmers' Agri-business Consortium etc.

References

Anon., 1987. Fishery Department at Glance in the Five Year Plan Periods, Department of Fisheries, Government of Manipur.

Anon., 1989. Manipur fisheries at a Glance, Department of Fisheries, Government Of Manipur.

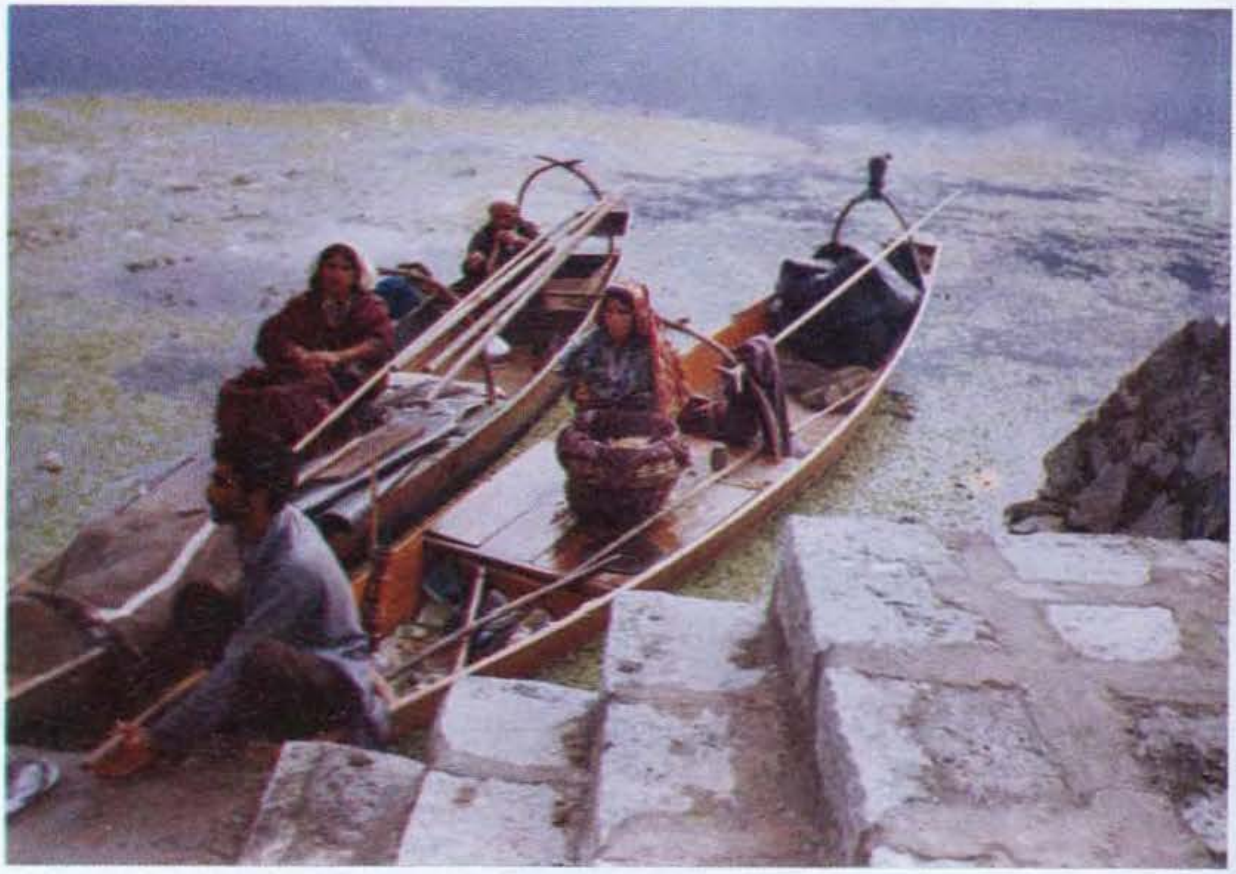
Singh, S. S., 1995. Involvement of womenfolk in fisheries in Manipur. CIFE, Mumbai, Dissertation.

Women in Fish Farming & Fish Retailing in Manipur
(Courtesy : Ms. Sunita Khangbam, Directorate of Fisheries, Manipur, Imphal)

A Women Fish Retailer in Srinagar
(Courtesy : Ms. Asifa Khan, Srinagar)

Women in 'Jhora' Fishing in Darjeeling
(Courtesy : Dr. B. C. Patra, Midnapore, W. Bengal)

Women Fish Farmer Feeding in their Village Pond
(Courtesy : Dr. S. Ayyappan, CIFE, Mumbai)



Woman help in Boat Rowing & Fish Retailing in Kashmir
(Courtesy : Ms. Asifa Khan, Srinagar)

Role of Women in Fisheries Development in Jammu & Kashmir State (India)

*Asifa Khan**

Introduction

Today fish is regarded as a nutritious, protein rich food with less cholesterol, fats etc. and being preferred by many over meat and chicken. Famous as seafood it has become popular world over and its scientific farming, marketing and processing has become a vital sector of the economy. Scientific and technological advances have revolutionized the industry altogether.

In India too, the fishery Industry has assumed vital dimensions and drastic steps have been taken to promote the industry by establishing co-operative, adopting modern processing and marketing techniques and ameliorating the conditions of all those involved in the industry.

Jammu & Kashmir Scene

The state of Jammu and Kashmir has a conducive atmosphere, environment and natural resources for both warm and cold water fisheries. During the past 50 years the fish culture has been promoted through sustained efforts of both the Central and State Governments.

Manpower

Women by nature is a symbol of patience. This inherent quality has found her a place in all fields where patience is of paramount importance be it the field of electronics, communication etc. Fish culture too involves patience. Fish

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production, catching marketing and processing and a host of other operations in the trade naturally find women playing a vital as well as a crucial role.

In J & K this role of women can be categorized as a)-Exclusive and b) Ancillary.

Exclusive: It is limited to marketing. Fisherwomen every morning start from their home with fish in their willow baskets to sell the catch in busy markets and even in localities from door to door in areas quite distant from their dwellings. They use public transport. Here they are unwelcome commuters and the bus conductor asks them to put the baskets on the roof rack. This is their daily routine weather it is pleasant summer or cruel winter. Once they get down at the chosen pockets of the city they usually sit on the roadside where they fall prey to the police threats and play hide and seek or they would move from street to street and even door to door selling their commodity. As she sells her stock she has to board a bus again and face the same dilemma. On the way back home they buy vegetables and other eatables for their family.

Ancillary: In addition to marketing, the women are engaged in the following activities:

Net mending: Preparation and mending of fishing nets is a regular phenomenon in fishing trade. This is an effort of the couple. Besides they also do fishing.

Processing: In addition to fresh fish sale, women undertake processing on a limited scale, which includes drying and smoking of fish. Lack of adequate knowledge of modern scientific processing techniques and products adds to her agony.

Boat rowing: Women undertake rowing while men cast nets for catching fish. This involves physical labour and that too in the wee hours of morning. In addition a sizeable number of fishermen families do not have adequate water facilities and women have to go in boats to bring drinking water for the family.

Welfare schemes/measures

The State Fisheries Department with the financial help of Government of India and the State Government has undertaken some welfare measure/schemes. These schemes are:

Free group accidental scheme: The scheme has come into force in the year 1986-87 and all the active fishermen of the state numbering 12000, have been brought under the scheme for the current year 2001-2002. All the active and bonafide fishermen have been provided free insurance cover through *Alignment* i.e. National Federation of Fishermen Co-operative of India through FISHCOPFED, New Delhi, which is shared equally by Government of India and the State Government. The rate of premium per fishermen per year is Rs.14 and in case of death of a fisherman while fishing the Government of India pays Rs. 50,000/- to the widow or nominee of the deceased fisherman and in case of permanent disability an amount of Rs.25,000/-is being provided under the scheme. So far an amount of Rs.5.6 million has been disbursed to the families of deceased and disabled bonafide and registered fishermen of the J & K State.

Housing: In Srinagar District, two tier housing scheme for fishermen is operational one through centrally sponsored scheme under which four houses have been completed at Shalabagh near Srinagar. The Department of Rural Development is also providing houses under Indira Awas Yojna for the construction of low cost houses for the fishermen community living below the

poverty line.

Tool kit: With the assistance of District Rural Authority, a new scheme has been launched to provide almost 90% subsidized toolkits (Tub, Mug, Balance, Weight, Iron Nylon, etc) of the value of Rs.2000/per Mahigeer. For the last three years the Department of Fisheries has completed almost half the target of issuing the tool kits to the beneficiaries. It is hoped that by the end of this year remaining target shall be achieved.

Free nylon twine: Every year, the Department of Fisheries with the courtesy of Social Welfare Department, distributes free nylon twine among the bonafide registered fishermen. This helps them to fabricate their nets for better catch. For the last three years almost all the registered fishermen have been covered under this scheme.

Scholarships: The Department of Fisheries recommends deserving cases for sanction of scholarship from pre matric to graduate level to the Social Welfare Department. A number of scholarships have been disbursed to provide assistance to children of fishermen for better academic career.

Suggestions

Despite the welfare measures, the plight of the fisherwomen in the State continues to be miserable on several fronts and which has adversely affected the fishing trade and the community fishing. Following measures are suggested:

Fish sale market: There are no wholesale or retail fish markets in the state, which puts the fisherwomen to inconvenience. The time she spends in traveling to sell her catch and the physical labour involved could be saved and exploited in

some other way. Moreover, a market would ensure standard selling prices instead of the fluctuations.

Education: The fisherwomen are illiterate with no exposure to modern social, economic and political developments. Therefore, there is a need to launch an adult & functional literacy program. Efforts are being made by the Department of Fisheries to start such a program in coordination with Adult & Continuing Education Centre of the University of Kashmir. There is also need for establishment of schools in and around the cluster of fishing community so that their children have adequate educational facilities.

Medical facilities: Medical camps would ensure better medical facilities for the community, which is the immediate need.

Housing colonies: Though the Central and State Government are providing better housing facilities to the community, there is a need to establish a few exclusive colonies with modern facilities. The colonies need to be established around the fish catching areas.

Creche: There is a need to establish creches in the fishing villages to enable the fisherwomen to have their children in safe custody. This creches could also groom them for schooling.

Improving the Socio-Economic Status and Empowerment of the Women in the Konkan Region of Maharashtra through Involvement in Aquaculture Activities

*S.D.Tripathi & Benazir Patil**

Introduction

Development means empowering people and creating an enabling environment for their initiatives in all spheres of life. Along with recognizing that people themselves have to make the decisions about their lives, developing their capacities to make informed decisions and to implement their decisions is central to empowerment.

The economy of Konkan is mainly based on agriculture. The agricultural production of coastal Konkan is very poor because of increasing salinity due to tidal influx. Lack of employment opportunities and limited sources of income have resulted in migration of men to metropolitan cities especially Mumbai in search of livelihood. This has resulted in the womenfolk looking after the household, agriculture and the daily home-based activities. Often they have to work on farms of others to supplement the family income.

The government has been trying to improve the productivity of the Konkan khar (saline) lands through various interventions for the last fifty years. One of the efforts in recent years is construction of dykes by the Khar Lands Development Circle (KLDC) of the Department of Irrigation, Government of Maharashtra. This program has been undertaken in collaboration with the

*Saline Lands Reclamation in Maharashtra Project - Phase II Sinchan Bhavan, Kopry Colony Thane (East) - 400 603 (Maharashtra)

European Union under the Saline Lands Reclamation Project-Phase II (SLRP-II) in all selected areas of four coastal districts of Konkan affected by incursion of tidal waters.

Considering the socio-economic and political status of the women in Konkan, the project also focuses on their development. The project aims at their economic empowerment and development through suitable aquaculture technologies. The project proposes to introduce entrepreneurship development programs.

Fisheries resources of the Konkan region

Konkan region comprises the entire coast of Maharashtra and is sufficiently rich in marine fisheries resources. The resources are exploited by a fishermen population of 300,000 who inhabit in 395 fishing villages. There are 184 fish landing centres. Besides, the industry involves another 200,000 ancillary workers. With a landing of 397,901 metric tonnes during 1999-2000, the state ranked fourth in marine fish production in the country and registered a foreign exchange earning of Rs 6550 millions.

As the rivers are seasonal, their fisheries are of no consequence but some of the creeks/estuaries are rich in the seed of euryhaline species such as mullets and seabass.

Mariculture is unknown but there exists a scope for its development as natural grounds of clams (*Meretrix casta* and *Paphia malabarica*), oysters (*Saccostrea cucullata*) and mussels (*Perna viridis*) exist especially on the Ratnagiri coast. Commercially important species of seaweeds are also available, especially in Malwan area.

Inland aquaculture is primarily limited to brackish water, particularly shrimp farming; fresh water aquaculture is popular only in Raigad. Though fresh water storage is essential for the very survival of the entire khar land region of the

Konkan, there is no impounding of freshwater to control the vertical migration of salinity and for irrigating the vegetable crops and charging the wells for drinking water. At least, 1 ha of freshwater impoundment holding about 3 ha-m of rainwater is necessary for each 10 ha of khar lands.

The seed of jitada (*Lates calcifer*), mullets (*Liza parsia* mainly), pearl spot (*Etroplus surantensis*) and *Penaeus merguiensis* that are suitable for culture both in fresh and brackish waters is available in the creeks. In some cases, they enter the rice fields during the monsoon where these are reared for 3-4 months. The seed of freshwater prawns, *Macrobrachium rosenbergii*, is also available from nature and is collected and marketed for culture.

Employment opportunities in fisheries and aquaculture

Opportunities already existing and being exploited

Most of the fish processing industries are located in cities like Mumbai or Ratnagiri, because of this the rural women face limitations of paid employment. Most of the women employed in these plants are from outside the State. However, there are tremendous opportunities for self-employment, especially at the landing centres and around the creeks where either large quantities of fish are landed or there is abundance of oysters, mussels and clam beds, which are traditionally exploited by women. At the landing centres, women predominate taking charge of handling of catches. Marketing of fish and shell-fish is almost the sole province of women in the Konkan region. While 65% of the landings are sold fresh by women, certain species of fish and surplus catches are dried or salted. Since 33% of the fish is processed and 2% salted, which also provide sufficient employment for women in the Konkan region.

New opportunities recently created

Ornamental fish culture and collection of seaweed practices have recently been introduced. The College of Fisheries, Ratnagiri and the Central Institute of

Fisheries Education, Mumbai have been training the women in ornamental fish culture and also in preparation of fish feed for ornamental fish and shrimps. These activities have been identified for further propagation in the Khar Lands schemes.

Opportunities proposed to be created through technology intervention

Seed collection: In West Bengal, seed collection from nature is an activity that provides self-employment to a large number of men and women. Konkan coast is also rich in seed availability of a number of commercially important species. Women can be trained in seed collection of mullets, mainly *Liza parsia*. Supply of trash fish for culture of jitada, *Lates calcarifer*, and crabs are other areas that could engage them profitably.

Backyard hatcheries: Though the seed of giant freshwater prawn, *Macrobrachium rosenbergii* is available in Maharashtra, it is restricted to the northern Konkan region. It is likely that pollution loads in these creeks may sooner or later affect its availability. It is therefore, proposed to establish backyard hatcheries which could be a source of income for the family. It would be possible for women to attend to the rearing of the larval stages alongwith their household chores.

Fattening of crabs: Crabs (*Portunus pelagicus* and *P. sanguinolentus*) are a high value resource abundant in the region. The small crab fetches only Rs 5 each but the larger one as much as Rs 100/-. The time taken to fatten them is about three months. The crabs can be fattened in cages installed in the creek and fed on either offal or molluscan meat. Trash fish collected from the creek also could be used. The infrastructure costs are very low, and profits sufficiently high.

Mussel and oyster culture: Rocky coasts and sandy beaches along the Konkan coast abound in mussels and oysters suggesting the suitability of these sites for their culture. The technology of mussel and oyster culture is now available, and to begin with would be propagated at selected sites through Group Management and

Women's Cooperatives. Wherever possible, these would also be cultured in shrimp ponds where they would act as bio-filters and reducing the level of suspended solids. This would also lead to enhanced income.

Production/marketing of value added products: Production of mango pickle, *papad* and *cocum* syrup are almost household activities in Ratnagiri and Sindhudurg districts, both on as an individual and cooperative basis. Simple technologies to prepare prawn pickle and fish wafers are available and some cooperatives are already involved in production and marketing of these products. Training programs to transfer the technologies would be organised and the women cooperatives or Mahila Mandals involved in production and marketing.

Seed production of common carp and javanicus: Both common carp, *Cyprinus carpio*, and java puti, *Puntius javanicus*, are pond breeding in habit and their spawn production is thus very simple and can be adopted in project area.

Developing Entrepreneurship among the Tribal Women by Preparing Value-Added Products from Locally Available Fish and Agricultural Wastes

*Maya Bonde, Ch. Balamani, V. R. Bonde & V.B. Sutar**

Introduction

The Dhule district of Maharashtra State has semi-arid climate with paucity of rain and pre-dominant tribal population. Some of the tribals have taken up fishing as part time vocation. The fishes caught are generally of low value. Tribal women in the district are also involved in fishing and farming. Most of the population lives below poverty line. Krishi Vigyan Kendra (KVK) Dhule had taken up a program to train tribal women for preparing value- added products from the fish catches, fruits and agricultural wastes. Under this program 125 women of four nearby villages were given training to prepare the above mentioned products. The post -training appraisal showed that above 25% of the women have taken up preparing fish/prawn pickles as part time profession along with fishing. 50% of them found vermi-composting of agricultural wastes as a more convenient option along with housing and farming schedule. The women did not adopt fruit processing and fish feed preparation on a large scale.

Thus the vermi-composting is an appropriate technique for disposal of biologically decomposable organic waste materials for making compost of high quality. *Eisenia foetide* is the preferred species of earthworms for making vermi-compost, as it is the most prolific multiplier. The agricultural wastes are converted into vermi-compost, which is rich in nutrients and beneficial microflora. The verm casts also add to fertility.

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Marketing

The women of villages carry the fruits and fish catches to the nearby town market for sale but getting nominal prices for the produce. The produce get spoiled en-route due to improper handling and erratic transport system and thus get less price for their products. Moreover the fishes caught are of very small size and less preferable by the consumer. The rural women especially the tribal women of the area have to undergo the above mentioned drudgery apart from their schedules of management of farmed animals and cooking etc.

KVK, Dhule extension program

As a part of the extension program of Home Science Division of KVK, Dhule, four nearby villages were selected for developing entrepreneurship among the tribal woman by preparing value-added products from locally available fish and agricultural wastes. Demonstrations were arranged through telecast on local TV channel. A fortnight's training program was arranged in which various techniques viz. preparation of fish/prawn pickle, preparation of fish feed, vermi-composting of agricultural wastes and processing & preservation of fruits were demonstrated. The economics of the products are given in tables I—II. A post training survey was also conducted to see the effects of the program.

Table1. Economics of vermicomposting

S.No.	Material	Quantity (Kg)	Rate (Rs./Kg)	Total (Rs.)
1.	Agricultural wastes	100	0.40	40.00
2.	Cattle dung	50	0.30	15.00
3.	Earthworms	1000 Nos	0.40/piece	400.00
Total		150 Kg		455.00

Total losses—25%
Total amount of vermicompost prepared—105Kg
Cost of production of vermicompost (per Kg)—Rs.3.80/-
Market price of vermicompost (per Kg)—Rs.5.00/-

Table 2 . Economics of making pickles of fish/prawn

S.No.	Ingredients	Quantity	Cost for fish pickle (Rs.)	Cost for prawn pickle (Rs.)
1.	Fish/Prawn	2kg	60/-	30/-
2. 3. 4.	Ginger Garlic Chilly	25gm 50gm 25gm	5/-	5/-
5.	Oil	400gm	20/-	20/-
6.	Miscellaneous	-	10/-	10/-
Total			102/-	72/-

Total weight of fish/prawn pickle 1.500 kg. Total cost of 1 kg fish pickle—Rs.68/-.
Total cost of 1 kg prawn pickle—Rs.48/-. Market price of 1 kg fish pickle = Rs.120/-
Market price of 1 kg prawn pickle = Rs.120/-

Table 3 . Economics of fish feed preparation

S.No.	Ingredients	Quantity (kg)	Cost (per kg)	total
1.	Maize	8	4	32.00
2.	Soybean	8	8	64.00
3.	Rice bran	8	0.70	5.60
4.	Nachni	8	5	40.00
5.	Fish/prawn waste	8	6	48
6.	Mineral mixture	0.4	50	20.00
7.	Maida	1	12	12.00
8.	Labor cost	1 labor	40	40.00
9.	Grinding cost	40	0.50	20
Total		41.400		281.60

Total cost of 1 kg fish feed— Rs.6.70 p.
Selling price 1 kg fish feed Rs.12/-.

Impact of training program

Of all the techniques demonstrated, vermi-composting of agricultural wastes showed an overwhelming response (Table-4). Next to vermi-composting, making of fish/prawn pickle was preferable choice among the trainees. Response to fish feed preparation and fruit processing & preservation was negligible.

Table 4. Impact of the program

S. No.	No.of women trained	No. of women responded to			
		Vermicomposting	Pickling	Fish feed preparation	Fruit processing
1.	Total 125	62	31	5	7
2.	Percentage	50	25	-	-

Vermi-composting was adopted on a large scale owing to simplicity of the technique; easy and abundant availability of the material; and no efforts of marketing as it can be used in their own agricultural fields. Marking of fish/prawn pickle was adopted due to popularity of the product among the villagers. They sell the product to the village retailers from where the local people purchase the pickles in small quantities as per their needs. But further commercialization is needed for better economic returns.

There is a need to form self-help group to promote manufacturing and marketing of produce to get better economic returns. Feed preparation and fruit processing and preservation showed least preference because their marketability is a problem.

Involvement of Women in the Inland Fisheries Sector of Marathwada Region of Maharashtra State, India

*S.P. Chavan**

Introduction

Marathwada is a central province of Maharashtra State covering 64,717 km^2 area with 98,015 ha inland water resources distributed in the major river and their tributaries and a number of small, medium and large reservoirs constructed on them, numbering 918.

A population of 40,000 is involved in inland fisheries activities in Marathwada of which about $1/4^{th}$ are women. Castes and tribes involved in fisheries are given in Table1.

Table1. Fisher communities of Marathwada

Community name	Gender involvement in fisheries Only male	Only female	Male, female both	Type of involvement Active & full time	Part time
Bhoi (machi)	-	-		Only men	women
Koli	-	-		Only men	Women
Salewar		-	-	-	Only men
Manewar		-	-	-	Only men
Chambar	-	-		Only men	women
Atar(muslim)		-	-	-	Only men
Hatkar		-	-	-	Only men
Muslim		-	-	-	Only men
Gangaputra (migrant from Andhra Pradesh		-	-	Only men	Only men

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A study was conducted in all the eight districts of the region to assess the role of women in fisheries. The region remained for a long period of 224 years under Nizam regime and merged in 1948 in Maharashtra. Deep- rooted superstitions has great impact on the population. More than 70% population is based on agriculture. In well irrigated districts of Parbhani, Hingoli, Nanded and Jalna with more than 2000 km irrigated canals and 10 major reservoirs, fisheries development has been initiated. In almost all the districts of the region fish from the reservoirs is the chief source of fish marketing.

Involvement of women in fisheries

Very few women are involved in actual fishing in Yeldari reservoir. Mostly women are involved in fish marketing of fish and dry fish. Of the 40,222 fishermen population (1991 census) only 0.5% women are actively involved in fisheries activities.

In the region 426 co-operative societies exists with 17,729 members. The main activities are fish seed production, stocking of reservoirs & tanks and fish marketing. Directorate of Fisheries, Maharashtra provides technical guidance and financial subsidy support to co-operative societies for seed supply, net purchase, fishing craft making and maintenance. One of the remarkable feature of these co-operative societies is inclusion of women members (generally between 1-3) to fulfil the quorum as per co-operative society rules. Women are generally involved in fishing of weed fishes, collection of small river prawns, marketing of dry and fresh fish.

Effective Fisheries Management through Community & Development Based Participation

*Suchitra Upare & V.B.Dalvi**

Introduction

There is no point denying the fact that the women have suffered utter neglect and deprivation over centuries. In spite of this they still have made significant contributions in all walks of life. It was in this context that the United Nations had declared 10 years period ending in 1985 as the " Decade for women", with a view to promote genuine equality between women & men , ensure the full integration of women in development as participants & beneficiaries .

Of late women in fishing sectors have become a subject of global discussion. They have been neglected , discriminated and ignored, on all fronts by the male dominated society everywhere, especially more so in developing countries. By far they have remained as invisible workers, but a vital force to reckon with.

Although the Indian constitution provides for equal rights & privileges for men and women and makes special provision for women to help them to improve their status in society. Since 1970's a serious concern for women's emancipation in all spheres is expressed. In fisheries field, the involvement of women is far more prominent, yet the situation is no better. As a matter of fact the fisheries development system has not yet taken fisherwomen population seriously in the mainstream, of its development process. Hence, it is high time that this issue is discussed & deliberated at the regional and national level in order to sensitize people about its potentiality.

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Profile of Fishewomen

The fisherwomen has always been a dynamic lady as compared to farmwomen , since the responsibility of price fixing, product sourcing, retailing & marketing (i.e. post -harvest techniques and marketing) is entirely the fisherwomen's domain.

By and large the fisherwomen have remained " invisible workers ". Recognition of their crucial role in fishery and its allied activities should not obscure the fact that these women continue to be concerned with their primary functions as wives, mothers and homemakers. Despite the participation of women in post- harvest techniques & marketing, they face severe hardships & handicaps. Managing household activities along with the cumbersome techniques of sun-drying, curing, pickling and selling the fisherwomen is a bundle of energy working round the clock.

It has been widely expressed & propagated by experts & consultants, that a successful approach to development & progress in fishing community is through a *Community Development Approach*. This involves increased utilization of resources in eco - friendly manner, better participation of the members of community & inculcating a spirit of co- operation among members to improve their standard of living and motivate them towards working for better amenities.

Community participation

The fisheries sector being broadly classified into two categories - capture fisheries and culture fisheries. Although in capture fisheries women do not have much of participation, but they play a vital role in post- harvest technology area. Community participation in fisheries sector would contribute much to alleviate poverty and eradicate malnutrition in community. Cooperatives can play an important role. In the Konkan region, the district of Ratnagiri is a focal center of

tremendous fishing activity especially marine fishery. There is scope for development of aquaculture activity, with the availability of natural marine resources in abundance. Krishi Vigyan Kendra has a program to create community awareness on various culture techniques of edible crustaceans, mollusks and seaweed species having commercial importance both in terms of market and export – driven demand. A development strategy has been implemented in consultation with local leaders & representatives of fishing community.

Fisherwomen must be given the opportunity and the means to increase their capacity to contribute to their own welfare and that of their families and community through effective economic activities. These activities not only generate resources which help to improve standards of living and nutrition, but also assist women to become more self – reliant, acknowledged partners in development. The activities can be identified as:

- Activities directly related to fisheries- processing and marketing
- Aquaculture activities i.e. brackishwater , fattening of crabs , mussel Culture
- Collection of fish fry and prawn seeds
- Non-fisheries income-generating activities; like tourism
- Agri- based industries like fruit preservation & processing
- Financial activities : investment , credit and savings

A vital factor towards strengthening of economic activities of the fisherwomen is through self- help group approach. 99 % of the fisherwomen being disadvantaged- are characterized by lack of education & access to lack of financial resources – both of which are required to help them work their way out of poverty and for upward economic strengthening and social mobility.

The fisherwomen can be trained for preparing value - added not only of shrimps but also of other edible species as well as encourage them to diversify.

from the routine fishery business to learn other skill oriented work like making of coir products, ornamental pieces from shells and other activities as per regional resources & market trends.

Backyard Giant Freshwater Prawn Hatchery for Women

*A.K. Reddy & Chandra Prakash**

Introduction

India has vast potential resources for the culture of giant freshwater prawn also known as scampi (*Machrobrachium rosenbergii*) but availability of seed is a major constraint. Though few commercial and backyard hatcheries have been established, mostly in the East - coast of India, the production from all these hatcheries and from some of the tiger shrimp hatcheries comes to about 300 million per annum (Reddy and Kohli, 2000; Dixitulu, 2001). There is an enormous scope for freshwater prawn aquaculture as it is an immediate alternative to tiger shrimp as an export commodity. Many shrimp farmers are struggling because of disease problem in farmed shrimps and are on a look out for other candidate species that can be cultivated in their already existing farms. Scampi can be cultured in mono and polyculture systems with carps and could be cultured in ponds with low saline water. There is an urgent need to establish commercial and backyard hatcheries at suitable coastal sites as well as in inland areas where saline water, that meeting hatchery requirement, is available. The concept of backyard hatcheries is already very popular in many south-eastern Asian countries. The Central Institute of Fisheries Education, Mumbai has been regularly imparting hands-on-attachment training to women on management of backyard hatcheries for giant freshwater prawn. Backyard hatchery concept was demonstrated to fisherwomen residing in nearby Versova Fishing Village by establishing hatchery in their village.

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Hatchery technology

The giant freshwater prawn hatchery has already been developed and perfected in different parts of the world. For the establishment of giant freshwater prawn hatchery the following points are to be essentially considered.

Hatchery shed

The backyard hatcheries are simple temporary sheds covered with semi-transparent sheets such as 'Silpolin' supported by wooden or cement pillars and bamboo poles. Such type of plastic sheets allow the day light to pass through and provide required sunlight to the larval rearing tanks. The size of backyard hatchery shed varies according to the space available for the purpose or as per the targeted production. The shed is essentially required to house the hatching tanks, larval rearing tanks, *Artemia* hatching jars and post-larvae holding tanks etc.

Broodstock

Backyard hatchery needs very few brooders. These can be obtained from the commercial hatchery operators or from grow-out ponds or from the natural resources. Sometimes, even stage – 1 larvae can be obtained from commercial hatcheries.

Production of larvae

The life cycle of giant freshwater prawn consists of 11 larval stages before their metamorphosis into post-larvae. In order to achieve better survival growth, it needs healthy stage – I larvae. These stage-I larvae can be produced in the backyard hatchery itself. For this healthy berried females with grey colour eggs are to be obtained from various sources. On arrival to the hatchery site, the berried females to be given prophylactic treatment with 50 ppm formalin to avoid entry of any infection into the hatchery. Then the berried females are released in the 50 l capacity plastic tubs filled with 6 ppt saline water. Each tub can be stocked with two berried females of 50 g in weight each, which give about

50,000-60,000 stage-I larvae. The eggs may hatch in a day or two. These stage-I larvae need to be transferred to rearing tanks for their further development. Now the newly hatched larvae have to pass through eleven larval stages before they metamorphose into post -larvae.

Rearing of newly hatched stage-I larvae upto post larval stage

The larval rearing unit plays a major role in the successful operation of a backyard hatchery or a commercial hatchery. The larvae can be reared in different size and shape of tanks rearing from 100 l to 10,000 l capacity. The tanks may be circular or rectangular or parabolic in shape. For backyard hatcheries smaller circular tanks of 300 to 500 l capacity are convenient for easy operation. In order to achieve better survival and higher production, the stocking densities are suggested by different authors. The Central Institute of Fisheries Education follows the practices of multi-phase system with different stocking densities. Normally two to three phase system is followed. In the first phase, larvae are stocked at high densities ranging from 400 to 500 stage-I larvae per litre and reared for 12 to 15 days period, by that time the larvae reached to VIth to VIIth stage. In this phase the survival ranges between 85 to 90% and then the advanced larvae are shifted to second phase. In this phase advanced larvae are reared at low-densities ranging from 80 to 100 larvae per litre, till they get metamorphosed into post-larvae. At optimum environmental conditions, the first batch of post-larvae could be observed between 20th and 25th day and about 95% of larvae get metamorphosed into post-larvae in about 35 to 40 days, where the cycle is normally terminated and the tanks can be further used for new batch of larvae.

Feeds

A wide variety of live and artificial feeds are used in combinations, which

can vary in different prawn hatcheries. *Artemia* nauplii, *Moina* and egg custard are used as principal diets. At different stages of larval development, the larvae are fed as per the schedule given Table 1.

The production of *Artemia* nauplii and culture of *Moina*can be easily taken up by women. The egg custard can also be prepared with locally available ingredients at home. Generally it is prepared with various combinations as suggested by various authors. One of the formulae for preparation of egg custard is given below:

Egg	-	2 nos	Yeast	-	2 gm
Milk powder	-	40 gm	Agar	-	4 gm
Corn flour	-	40 gm	Codliver oil	-	1 ml
Shrimp/prawn/squid	-	40 gm	Vitamin –mineral mix	-	1 gm

Table 1. Feed and feeding schedule for different larval stages of Giant Freshwater Prawn

Age of larvae	Stage	Feed constituents and amount					
		Artemia nauplii		Moina		Egg custard	
		No./ml	No. times per day	No./ml	No. times per day	g/ml	No. times per day
2-3	I-II	2-4	2	-	-	-	-
4-6	III-IV	4-5	3	-	-	-	-
7-15	IV-VII	5-6	3	2	2	0.10-0.25	1
16-25	VII-XI	6-8	1	3	2	0.40-0.60	2
26-35	IX-PL	6-8	1	3	2	1.00-1.50	3

Preparation of egg custard

In the first step, cook the shrimp or prawn or squid thoroughly. Then all the ingredients except vitamin-mineral mix are blended thoroughly by adding desired volume of water. The blended mixture is taken in a vessel and cooked on water bath or in a cooker. The cooked custard is allowed to get cool. After cooling, vitamin and mineral mixture is added and kept in refrigerator. As desired, the egg custard is passed through strainers having mesh size of 0.3 mm to 1.0 mm to get various size of particles to feed different larval stages.

Water quality

The water quality of the larval rearing tank is scrupulously maintained by managing the various parameter in the following range which is usually done by replenishing the water from time to time.

Parameter	**Range**
Water temperature	28°-30°C
Salinity	14 ± 2 ppt
PH	7.0-8.5
Dissolved oxygen	4.0-6.0 ppm (preferably to be maintained as saturation level)
Hardness ($CaCO_3$) of freshwater	< 50 ppm
Ammonia nitrogen(NH_3-N) -	< 0.1 ppm
Nitrite nitrogen(NO_2-N)	< 0.1 ppm
Nitrate nitrogen(NO_3-N)	< 20 ppm

Harvesting

After 35 to 45 days of rearing, the larvae get metamorphosed into post-larvae and look like miniature adult prawn. The post larvae of 6.0-7.0 mm size are harvested with dip net/ scoop net by reducing the water level. The euryhaline post-larvae are gradually acclimatized to freshwater within 2-3 days period. The post-larvae can be supplied to the farmers for further rearing in nursery/grow-out ponds.

Results obtained at Backyard Hatchery run by Versova Fisherwomen group is presented in Table 2 and economics of a 0.25 million post-larvae hatchery is given in Table3.

Table 2. Results of the back yard giant freshwater prawn hatchery, demonstrated to fisher women at Versova village, Andheri (West), Mumbai-400 061 during the year 1995

Trial	No. of tank	Tank volume (l)	Total volume of water (l)	Stock implicitly of stage-I larvae (No./)	Total No. of stage-I larvae (in'000)	Total No. of PL narvested (in'000)	Rearing period (days)
I	3	200	600	150	90	22.5	38
II	3	200	600	150	90	23.8	42

Table 3.Backyard Giant Freshwater Prawn Hatchery

Assumptions: Target production of post-larvae = 0.25 million per annum, Number of cycles = 3, Stocking density of larvae = 150 No./litre, Survival = 25%, Volume of rearing water = 2,500 litres, Number of larvae per cycle = 375,000, Number of post larval production per cycle = 93,750. Total post larval production in 3 cycles =2,81,250.

I. Non-Recurring Costs

Sl. No.	Particulars	Cost (Rs.)	Depreciation	
1	Shed (30 m^2)	10,000=00	25%	2,500=00
2	FRP tanks of 3001 capacity 10 nos	30,000=00	10%	3,000=00
3	Plastic pools of 2.0 m dia x 1.0 m	8,000=00	25%	2,000=00
4	Pump 0.25 H.P. 2 nos.	5,000=00	25%	2,500=00
5	Refractometer 0-100 ppt 1 no.	9,500=00	10%	950=00
6	pH meter	2,000=00	10%	200=00
7	Plastic tubs of 50 1 capacity 6 nos.	1,500=00	20%	300=00
8	Microscope	25,000=00	10%	2,500=00
9	Air blowers of 0.5 H.P. 2 nos	20,000=00	10%	2,000=00
10	Aeration accessories, pipe line water supply pipes, plastic wares, glass wares etc.	10,000=00	50%	5,000=00
11	Oxygen cylinder 1 no.	5,000=00	5%	250=00
12	Miscellaneous items	4,000=00	100%	4,000=00
	Total	**1,30,000=00**		**25,200=00**

II. Recurring Costs

1.	Broodstock	2,000=00
2.	Artemia cysts 10 tins	25,000=00
3.	Artificial feeds	10,000=00
4.	Chemicals, antibiotics, etc.	10,000=00
5.	Packing material	5,000=00
6.	Unforeseen expenditure	8,000=00
	Total	**60,000=00**

III. Fixed Costs

1.	Interest on non-recurring recurring costs @15%	28,500=00
2.	Depreciation	25,200=00
3.	Recurring costs	60,000=00
4.	Re-payment of loan	18,572=00
	Total	**1,32,272=00**

IV. Gross Income

Sale of 2.5 lakh post-larvae @ Rs.75,000 per lakh = Rs.1,87,500.00

V	**Net Income**		
	(Gross income-fixed costs)	=	Rs.55,228.00
VI.	**Rate of return on capital cost**	=	42.8%
VII.	**Rate of return on recurring cost**	=	92.05%

References

Dixtitulu, J.V.H., 2001. An over view of the present state of Shrimp Aquaculture in India. Fishing Chimes, vol. 20 No. 10 and 11, pp. 11-16.

Reddy, A. K. and M. P. Singh Kohli, 2000. Present status and future prospects of freshwater prawn seed production in India. In: Souvenir of the National workshop on Aquaculture of freshwater prawns, 8-9 February, 2000, pp. 17-19.

Case Studies of Women's Co-operative Societies in Fisheries from Ratnagiri District (Maharashtra)

*S.A. Mohite & Shakuntala Shenoy**

Introduction

The fishing is carried out by the menfolk while cleaning, processing and marketing of fish is done by women in the Konkan coast of Maharashtra. Most of the woman take up this profession to continue their family business and to supplement family income. The job is highly demanding and generally involves long hours of work. Besides attending house hold chores , they attend the fish landing centres and take part in wholesale and retail marketing.

In Konkan coastal zone the fisherwomen are observed involved in fisheries activities such as:

1. Sorting of the fish
2. Icing and selling it in local markets.
3. Sending the fish to processing factories
4. Door to door selling of fish
5. Salting and sun drying of the fish
6. Mending the nets during non-fishing season

Fish marketing

Marketing is one of the important aspects in fisheries, which is basically looked after by the fisherwomen. It is a known fact that though the fishing is done mostly by the fishermen, the responsibility of sorting and selling the fish is shouldered by the fisherwomen. This starts at the landing center itself where the fish is sorted according to the quality, commercial value etc. The catch is assorted size-wise and value-wise and iced. Most of the catch having higher commercial value is sold to the suppliers of export houses through auctions. But the

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remaining catch is sold to either in fresh condition at local fish markets, weekly markets in small towns or rural areas, fish stalls near railway stations or bus stands. But still the marketing is not organized as there is no proper marketing policy or price structure or proper marketing outlets.

There are many middlemen involved in the marketing of fish and most of the profit is shared by them. Though these important activities are looked after by these womenfolk, basically they are not organized . In recent years, co-operative societies are being established in the belt.

Fisheries co-operative in Ratnagiri

Ratnagiri district is known as the main fishing center having a coastline of 164 km . There are 38 fish landing centres. Out of 51,500 fishermen population 11,500 are active fishermen. Almost all of the women from these families are actively involved in the fishery occupation. At present, there are 68 co-operative societies in Ratnagiri district. Out of these, only seven are fisherwomen co-operative societies.

The seven listed fisherwomen co-operative societies of Ratnagiri district are as follows:

1. Mirkarwada Mahila Macchivyavasaikanchi Seva Sahakari Sanstha Maryadit, Mirkarwada, Ratnagiri.
2. Rajiwada Mahila Macchimar Sahakari Society, Rajiwada, Ratnagiri
3. Shramik Mahila Macchimar Sahakari Society, Tulsunde, Tal. Rajapur.
4. Sahrinate Mahila Macchivyavasaik Sahakari Sanstha Mayradit, Nate, Tal. Rajapur.
5. Mahila Macchivyavasaik Sahakari Sanstha Maryadit, Burondi, Tal. Dapoli.
6. Saraswati Mahila Macchivyavasaik Sahakari Sanstha Maryadit, Katale Padave, Tal. Guhagar.

Case study 1. Mirkarwada Mahila Macchivyavasaikanchi Seva Sahakari Sanstha Maryadit, Mirkarwada, Ratnagiri

This society was started in 1975 mainly for the distribution and selling of fresh and dried fish in the nearby weekly markets. There are 175 women members in this society. The total percentage of the registered members in comparison to total fisherwomen in the village is 30-40. The criterion for the membership is based on the quota distribution to various weekly markets such as Lanja-75, Vandri-25, on Tuesdays; Kadwai-25, Vahal-25, Nairi-20, Pachal-40, Pali-30, Sangameshwar-60 on Wednesday etc.

The society has two trucks and two buses, which are used for taking the fish and the members to the weekly markets nearby Ratnagiri such as Chiplun, Sakharpa, Sangameshwar etc. At the time of data collection, the Co-operative society was not having its own office building. But the share capital collected was Rs. 79,590/-. The cost of each share is Rs.10/- The minimum and maximum share holding capacity depends on the distance of the market from Ratnagiri. e.g. Devrukh Rs.400/- i.e. 40 shares. The income is only through the charges paid by the members for transportation, the amount of which depends on the distance traveled. The society owns 2 trucks 2 buses and one small platform for fish curing.

Facilities extended by the society to the members

The society provides transport to fisherwomen to carry the fish to various markets. The fisherwomen carry the fish from their own boats or buy the fish in auction on the fishing jetty at Mirkarwada, Ratnagiri and carry it to the markets as per the day of the weekly market at nearby villages. Most of the members are illiterate and there is no change in the standard of living of these members. The society has planned to build a fish curing yard and a ice factory and the

documentation for this is also completed but there is some problem in procuring a proper place for the fish curing yard.

Remarks

The society has limited membership and its activities are restricted only to the sale of fish with its own transportation system, which brings in limited financial benefits. Also the members appear to refuse to avail any of the government scheme. The only assets of the society are the transport vehicles and a small curing platform. Of these, the transport is used only for three days/ week and is idle during the rest of the week. The members sell dry fish during rainy season but no diversification of the fish products is taken up yet.

This Co-op. Society was considered as the trendsetter in the Konkan coastal zone. But at present the society is being considered for liquidation.

Case Study 2. Sakhrinate Mahila Macchivyavasaik Sahakari Sanstha Maryadit, Nate, Tal. Rajapur

This Co-operative Society was started in 1987 mainly for selling of fresh and dried fish locally. There are 150 fisherwomen members. This society works in Sakharinate, Tulsunde, Sagawe and Engalewadi. The society owned a truck by which it helps the fisherwomen to transport the fish to the market. The facility is inadequate for catering to needs of all members. Though the membership is strong but the society is not benefited and lagging behind in making profits. Diversification is needed.

Case Study 3. Mahila Macchivyavasaik Sahakari Sanstha Maryadit, Burondi, Tal. Dapoli

This Co-operative Society started in 1988 with 99 fisherwomen as members. Out of the total number of fisherwomen in the village, 25% fisherwomen have become the members. In the first year, the society extended help in transportation of the fish to local markets. Since the society does not own

any transport it is not able to provide transport assistance to its members, though earlier was arranging hired transport but discontinued presently. The society is also on the verge of liquidation.

Problems faced by the fisherwomen co-operative societies

The three fisherwomen co-operative societies studied have been established mainly for the transportation of the fish to local markets. Due to this only one restricted aim, the other problems related to these women were overlooked. They are as follows:

a) Availability of the curing yard to process the remaining fishes
b) Availability of ice factory for timely supply of ice
c) Enough vehicles for transportation
d) Efforts to educate the illiterate members
e) Child development schemes for the members
g) Extension programs to provide information about the govt. schemes to the members
f) Provision of ration shops, grinding mills etc for the members
g) Extension programs to provide information about the govt. schemes to the members

Only marketing will not keep these societies going. They have to initiate diversification and other schemes to keep the interest of the members in the society.

Fisherwomen and the government schemes

The other co-operative societies have started recently and yet to show their performance in terms of profits. But there seems to be a lacuna in the field of marketing strategies, diversification of the products and the proper understanding

of the governmental schemes directed towards the betterment of the fisherwomen. Most of the members still do not know about the financial schemes such as provided by National Cooperative Development Corporation.

Swarnajayati Gram Swaarogar Yojana

Government has recently introduced this scheme for people below poverty line, which can be used to the benefit of the fisherwomen groups. At present this scheme is introduced in Purnagadh, Varawde and they have been provided with 2 boats. The mahila bachat group at Varavde has been provided with cooler boxes to store fresh fish under the same scheme. Though this scheme is introduced keeping in mind the women under poverty line, very few groups have availed this scheme so far.

Other government schemes

The Central Government has come with a scheme for the production of fish products such as fish wafers, fish pickles etc. Under this scheme, 50% subsidy will be provided for the private agencies and women's groups. A few bachat groups, especially in Dapoli taluka, have started packing the dry fish in polythene packs so as to make them attractive and hygienic and selling them in nearby areas. This activity can also be taken up by the co-operative societies. Packaging the product in proper and attractive manner is the first step in marketing and the awareness about this has to be created in the fisherwomen.

Conclusion

Though the fisherwomen co-operative societies are basically established for the betterment of the members, it has been observed that they are only engaged in the transportation of the fish to the various local and weekly markets. These societies are facing various problems though they have a good membership.

The central and state governments have come up with various schemes but they have yet to percolate down to the members of these societies. At the same time, the members are still not aware about the tremendous demand to the value added and nutritious fish products. A proper marketing strategy is the urgent need of the fishery industry today.

The co-operative movement has seen golden results in fields like dairy, agriculture but the very essence of this movement has not yet reached to its fullest in the field of fishery. Hence the societies established so far seem to be groping in the dark. The co-operative sector is still open and looking for a golden leap in future!

Role of Women in Fisheries Development in Gujarat State

*P.D. Chaudhary**

Introduction

As per the census of 1997 fishermen population in Gujarat State is registered with 77,182 families, out of which 1,57,742 are the active fishermen and 52,962 are fisherwomen. Moreover, contribution of part-time workers and the fish based industrial workers is also remarkable.

While considering the role of women in fisheries sector, it is to clarify that the women work force has not been properly quantified and well documented. Mostly women perform twin roles (a) visible role in the production and service sectors and (b) invisible role in the management of household. Even though several hundred women are engaged in various fisheries related vocations, fisherwomen are living in miserable plight. They are engaged on payment basis and bound to serve 24 hrs. They have to work in odd hours and even during nights because many a times the boats come to the landing centers in night during the high tides. In the recent years, various schemes and programs introduced by Central and State Governments resulted in improvement in general conditions of fisherwomen.

Schemes for fisherwomen in Gujarat

- A scheme was introduced to give grant in aid of Rs.2000/- to the women of scheduled cast once to initiate the fish marketing and rolling business.

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- In marine fishery, subsidy is given for procuring FRP canoe to women beneficiary who actively involves in the fisheries.
- In the case of ST/SC women beneficiary, cycle box is subsidized at the rate of 50% to sell fish catch in the vicinity of tribal and non-tribal reservoirs. The unit cost of cycle box is Rs.2000/-.
- Under the comprehensive leasing policy, a decision was taken for women residing within 8 km radius of Bhuj city to be given reservoirs on lease under Kachh Fish Farmers' Development Agency.
- A training program on fish processing techniques exclusively for women is operative at Porbandar Training Institute. Duration of the course is 3 months with a stipend of Rs.300/-p.m., with a capacity of 100 women per year.
- Under the centrally sponsored National Welfare Scheme on 50:50 sharing basis between centre and state, a subsidy of Rs.40,000/- is given to fishermen for 35 m^2 plinth areas, which are to be allotted in the name of beneficiary's wife.
- Under the Fish Seed Rearing Scheme, the women beneficiaries are trained to grow spawn up to fry or fingerling stage with assistance of inputs like spawn, fertilizer, fish food etc. under the technical guidance of state fisheries staff. After completion of rearing period State Department buy back the seedling. Rearing charges are paid. After 15 days of fry rearing, fisherwomen get about Rs.1,500 to 3,000 and after 45-60-90 days fingerling rearing they get about Rs.4,000 to Rs. 6,000 per beneficiary.

Suggested measures for improving further socio-economics status of fisherwomen

❖ To identify infrastructure with reference to the role of women in fishery and related activities and to provide such support to them by way of cold

storage, processing space, transportation network, sales outlets and peeling sheds etc. under cooperative umbrella.

- In every field there is constant change and upgradation. To suite this in fisheries sector, proper training is needed for women work force. Necessary training centers may be set up for women in different levels to provide skills through appropriate professional training on different sectors of fisheries with inclusion of capture and culture fisheries. Facilities are also required to be made available in universities and other research and development institutions to conduct small group training for fisherwomen especially.
- During off-season alternative jobs/ vocations to be provided. Scheme like saving- cum - incentives may be strengthened to provide alternative livelihood.
- Financial weaknesses are basic drawbacks in fisheries, women are facing the same. Micro level loan facilities are essential to be disbursed through nationalized banks and NCDC sectors.
- Socio-economic census for fishermen will be an effective tool for proper assessment of numbers and exact share of women in the sector. Necessary data bank may be created to formulate their development program.
- While making policies for women involvement, NGOs can play a mediator role between government and private sector.
- For providing facilities like potable water, roofing, raised platforms and toilets to women in fish markets and landing centers. A Welfare Board exclusively meant for fisherwomen be introduced to look after their insurance, pension benefits, medical facilities, minimum wages, financial aids etc.
- Education to fisherwomen is must and should be encouraged.

Empowerment of Women for Fisheries Development-New Initiatives for Credit Delivery to Women

*M. A. Upare**

Introduction

India has a total population of 843.9 million (1990-91 Census), 37% of the population (312 million) lives below household poverty line (Rs.6400/-) of which 70% lives in the rural areas. Studies indicate that females headed households constitute the highest percentage of the lowest income bracket of rural households-poorest of the poor. Fulfillment of the responsibilities to the households is severe constraints by their unequal access to earning opportunities. In fisheries sector, women plays very important role in engaging themselves mainly in marketing, processing industry, net making, aquaculture etc.

Credit sources

Credit is an important input for any activity, therefore, access to credit is an important aspect. Women need credit both in the rural and urban areas, to increase their productivity and income. The emphasis in various government schemes on improving women's productivity through access to training and technology and economic need credit has to play a crucial role in achieving goals of economic growth and alleviation of poverty.

The present availability of credit in India for women is from the following important sources:

1) Formal credit structure which represents banks, co-operatives, Regional Rural Banks and other financial institutions like NABARD, SIDBI, etc.

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2) Quasi informal which represent linkages between banks and Self Help Groups, providing bulk financing for NGOs for lending to setting up of a National Credit Fund for Women by Government of India (Rashtriya Mahila Kosh).

3) Informal credit from relatives, moneylenders, wholesalers, Self Help savings and credit groups of women.

4) Women Development Corporations providing loans for margin money, training and assistance in arranging credit.

Role of NABARD

National Bank for Agricultural & Rural Development's (NABARD) credit facilities cover almost all types of activities (Agriculture, non-agriculture) for which the loan on investment credit is given by banks under refinance schemes. The activities can be taken up by individuals or groups, such as, individual loans, group loans, loans for industrial cooperatives, loans for workshops, infrastructural development and common facilities. NABARD can also under the existing scheme assist women activities through voluntary agencies and regional institutions for generating assured wage employment. Grants on selected basis are also available for technological production and setting up for training production center. NABARD also assist voluntary agencies and women groups on pilot project basis for developing replicable models which could trigger larger number of schemes within the banking fold.

Women are also given the assistance for the non-farm enterprises. NABARD's support can be availed for a program to be implemented within a period of 5 years. It is aimed at facilitating establishments by modernisation of rural non-farm projects of different types through production and marketing support, market information, technology, raw materials training and execution of credit linkages or any other services or combination thereof. The program should

lead to credit flow of enterprises through banks under refinance support through NABARD and thereby generating sustainable employment opportunities in rural areas in a cost- effective manner.

There are other organisations like SIDBI, Mahila Udyam Nidhi, Mahila Vikas Nidhi, Rashtriya Mahila Kosh, Self Help Groups and NGOs, International Organisations UNIFEM is also involved in providing financial assistance to women.

The strategy for increasing women's access to the formal financial sector should be a long- term goal with flexibility to adapt to local needs and situations. This will help build up an effective and efficient financial intervention. Besides, attitudinal change of society and removal of unequal inheritance laws and practices could enable women to exercise property rights and have a better standing in the society. The following action points are required to be taken up by banks in order to reach potential women entrepreneurs and encourage them to avail credit and credit plus services from banks:

- Redefining of Bank's policies/Long term plans
- Setting up women cells
- Simplification of procedural formalities
- Orientation of Bank officers/staff on gender concerns/credit requirements of women
- Publicity campaign for creating awareness about credit facilities
- Entrepreneurship Development Programs/Training facilities for women
- Specialised branches for women
- Motivational strategies to enthuse bank officials/staff
- Monitoring system
- Data collection
- Strengthening of existing schemes

- Increasing the limit for non-obtention of collateral security
- Involving NGOs/Self Help Groups/Women's Cooperatives
- Mahila Rural Cooperative Banks

New initiatives will empower women for bringing prosperity and alleviating poverty and developing fisheries sector in India.

Involvement of Women in Aquaculture Programs BAIC - a Bangladesh NGO engaged in Integrated Rural Development

*Md. Esha**

Introduction

BAIC (Barendra Advancement Integrated Committee) is a non-profit and non-government voluntary development organization established on 25th July, 1996 for improvement of the socio economic condition of the rural people through overall community development programs viz. agriculture, socio-economic , health and population, education, training and research.

Working Strategy

The main strategy of BAIC is to assist beneficiaries as the development partner of facilitator. It follows Group Approach - BAIC implements all projects by organising the farmers in groups and assisting them in arriving at decisions. BAIC also provides to the group members with technical and financial assistance. *Bottom up Approach*_- BAIC follows bottom up and participating approach in its working strategy.

(a) Family Approach: Though the women are organised as the primary beneficiary, but all the members of the family have to participate in developmental activities.

(b) Financing Strategy: It receives donations for foreign local funding agencies. Both grants or soft loans are taken. Members savings is another

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important source of finance. The savings are refundable but as revolving fund. BAIC also generates income from executing different revenue generating activities like micro-credit scheme, seed production, fish culture etc.

Target Group Characteristics

Group/Institution (Participant)	Characteristic Description	Motives Interests	Strength Potentials	Weakness
Type	Under privileged rural people			
(i) Landless farmers family	Under Privileged rural people 56.5% of total population Land ownership starts a household not having any land Cultivated area up to 0.50 acre. Profession: Agricultural workers.	Availability of financial support Availability of technical support Access to institutional support	More than 80% of them are Agricultural fertile land Labor active participation	Lack of technical know-how Lack of finance Lack of labor force participation

(ii) Marginal farmer family	Under privileged rural people 12.3 percent of total population Land ownership starts: 0.51 acre to 1.00 acre of land. Mostly farmers.	Availability of financial support Availability of technical support Access to institutional support. Availability to agri- material support.	More than 100% of them are farmers Fertile land available Labor active participation	Lack of technical know-how Lack of finance Lack of quality inputs.
(iii) Small farmer family.	Under privileged rural People 9.64% of total population Land ownership starts: 1.01 acre is to 2.49 acre of land. Mostly farmers.	Availability of financial support Availability of technical support Access to institutional support Availability to agri- material support	More than 90% of them are farmers Fertile land available Labor active participation	Lack of technical know-how Lack of finance Lack of quality inputs.

(iv) Woman	Under privileged segment of society Around 50% of total population Most of them are illiterate Most of them are deprived of basic facilities and are distressed	Availability of financial support Availability of technical support Access to institutional support Availability of legal support	Almost all of them are house wives Available labour Active participation	Lack of technical know how Lack of finance Lack of labour force participation Lack of participation on decision making process
(v) Children	Under privileged children Rural children	Availability of education support Availability of nutritional support Availability of health support	Available Time Positive attitude of parents Active participation	Lack of financial support for education/ food.
(vi) Tribes (Gyto Hajong and Santal)	Under privileged Most of them are landless deprived	Availability of financial support Availability of technical support Access to institutional support Availability to agri-material support.	More than 100% of them are farmers Fertile land available Labor active participation	Lack of technical know-how Lack of finance Lack of quality inputs

Additional Personnel capacity development of BAIC

Sl.No.	Category	Female	Male	Total
1.	Policy Making level	2	2	4
2.	Mid level	4	8	12
3.	Grass Root Level	8	31	49
4.	Support Staff	1	7	8
Total		25	51	73

BAIC fisheries development program & involvement of women:

To contribute to food security and poverty elevation in rural areas BAIC has taken up ambitious aquaculture programs. With the financial assistance from USAID and technical support from ICLARM. About 350 women fishers are successfully doing fish farming. Besides they are given financial assistance to undertake net making, fish selling. Training Programs are organised by BAIC from time to time for women about technologies more suitable to women fishers. BAIC is also promoting formation of women fisheries cooperative societies under its fold. Thus, BAIC is providing support for sustainable integrated rural development.

Women in Aquaculture : Initiatives of CARITAS Bangladesh

*Anwara Begum & Marcel D' Costa**

Introduction

Aquaculture and fisheries are indispensable part in the life and livelihood of the people of Bangladesh. The country is blessed with vast and varied fisheries resource in the form of ponds, dighis, baors, beels, haors, lakes, rivers estuaries etc. About 12 million people directly or indirectly depend on fisheries and 4 million people depend on aquaculture activities.

Fish production in the country is about 1.55 million mt and per capita annual fish availability is 11.93 kg. The culture fisheries contributed about 39% of the total fish production, while the rest (61%) is contributed by capture fishery. The average aquaculture growth rate of last ten years was 12.83%. The total catch is reported to have increased at an average rate of 3.5% per year over the period 1983-84 through 1995-1996. The increase in fish production is mainly attributable to the rise in production from closed water culture fisheries, particularly from pond aquaculture, shrimp farms and to the catch from the artisanal marine fisheries.

Bangladesh has more than 2 million of ponds with an area of 14,47,000 ha. In twelve years (1984-1996) the percentage of ponds under culture increased from 27% to 52%. Derelict ponds declined from 43% to only 17%. Most of the ponds are used mainly for domestic and irrigation purposes. About 50% of the total ponds are used for fish rearing and culture and more than 40% ponds remain without stocking. Data from different sources depicts that 93% ponds are culturing fish without following appropriate technologies.

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Scope of participation of women in fisheries in Bangladesh

In most rural communities, there are essential differences between the economic, social and political roles of men and women. This also holds true for fishing communities. The fisheries are predominantly perceived as the activity of men. Despite of the fact that there are difficulties for women to be involved in fisheries, there is a vast potential for women to contribute meaningfully in the fisheries sector.

Involvement of women in all development endeavors including agricultural is seen as a priority in development paradigm. Traditionally women have been playing a major role in agriculture. They have always been intimately involved in the agricultural production process. But a broad division of labour exists; wherein women are mostly engaged in home based agricultural work, while men perform agricultural activities in the field. Research studies show that besides regular household work, 43% of women are involved in activities related to agriculture and 15% had taken agriculture as their second line occupation. It can therefore be assumed that about 58% of women are directly/indirectly engaged in agriculture related activities. Similarly fishing too is a full time occupation of men, however, the involvement of women is also significant. They are directly or indirectly engaged in activities like making fishing nets, gears, repair and maintenance of the gears, sorting of fingerlings (especially in coastal areas), fish processing, transportation, marketing etc. Nevertheless, full time engagement of women in fisheries is no longer a rare scenario. Women are also involved in aquaculture and can further take up cage culture/pen culture in flood plain beels.

Women are also involved in following fisheries activities:

Fish seed collection and marketing: In the coastal areas many women are engaged in collecting seed, transportation, marketing of the fingerlings. It has created self-employment opportunity for women. Involvement of women can be further

increased through establishing mini hatcheries for carps.

Fish processing: This is also an area of women specific enterprise. They can undertake projects with indigenous and available species. These dry fishes can be marketed during the lean season to make good return of their investment. Besides, they can also buy fish from the trawler and deep-sea fishing boats directly and undergo the fish drying process.

Fishing gears: This is traditionally an area of work done by rural women. They have the required expertise and are aware of indigenous technology. It linked with skill development training and marketing of the products; this can also be an important area for the involvement of women in greater number.

Fish feed preparation: In Bangladesh, several women are involved with making prawn/fish feed at home for their own use. It has also become an important income generating activity, as they could sell feed to other farmers in the area. Women feel comfortable in making rice noodles. In fact, farmers use the same noodle-making machine for feed making.

Gender issues those hinder women participation in aquaculture activities

Following social and cultural issues hinder active participation of women in aquaculture which need to be addressed through formulation of appropriate plans and make conscious efforts to effect changes:

- Restricted mobility
- Societal norms
- Limited access to training program information
- Exclusion from decision making
- Lack of access and control over resources and credit
- Low literacy levels
- Lack of organised women's groups

- Lack of sensitivity towards women's role in aquaculture
- Lack of database

Aquaculture development: CARITAS initiatives

CARITAS a national level non-profit NGO established to work towards enhancement of human welfare and contribute to the national development of Bangladesh. Currently it has 44 projects in 11 different sectors. Aquaculture development is one of them. CARITAS adopts a people centered approach for all its development known as Development Extension Education Services or DEEDS.

Keeping the national context in views CARITAS Bangladesh began Aquaculture Development program (ADP) in 1981. However, the encouraging result of the pilot ADP, CARITAS launched the expanded Aquaculture Development Program (EADP-1) for 3 year during 1984 to 1986. CARITAS observed that rural people responded readily to fish farming practices as it resulted increased income and improved nutritional status. On people's demand CARITAS again expanded. During 1991-99 the project was implemented as EADP II having a greater coverage upto 1990. Sustainable Aquatic Resources Management (SARM) program has been launched for another years from 2001-2005 with new dimensions

Achievement of Caritas Fisheries program from 1983 to 2000:

Glimpse of activities

Sl. No.	Activities	Achievements	
		No. of project	Area
1	Pond re-excavation	1,591	509.97
2	Pond lease & purchase	3,224	2,344.28
3	Fish processing project	82	0
4	Natural fish catching project	1,104	0
5	Village based nursery	535	182.71
6	Paddy based nursery	4,634	6,935.99
7	Small pond fish farming	3,886	476.82
8	Integrated fish farming	1,937	476.82
9	Poly-culture	3,019	633.75
10	Hatchery support	9	92.56
11	Marketing support project	3,690	0
12	Demonstration on new technology	182	0
	Total	**23,893**	**11,652.90**

Group involvement:

Sl. No.	Subject	Numbers
1.	Total groups involved	6,366
a)	Male	3,441
b)	Female	2,925
2.	Total beneficiaries	69,443
a)	Male	39,981
b)	Female	29,462

Production & profit analysis during financial year 1999-2000

1	Average production cost/decimal US$	3.33
2	Average production/deci kg.	11.386
3	Average production / ha kg.	2,812
4	Average net profit/deci US$	7.94
5	Average per capita income US$	104.13
6	No. of small scale carp hatchery operating	09
7	Spawn production kg/year	680
8	Fry / fingerling production (Nos)	4-5 million

Note: 1US$=54 Taka.

Impacts of CARITAS fisheries program:

Resource utilization: The success of the ADP enthused the people to adopt fish cultivation practices in whatever water resources they owned. No derelict water bodies or ponds infested with water hyacinth can now be seen in these areas.

Technical aspect: Community awareness regarding fish farming resulting in many other people getting interested in fish culture. The farmers are able to continue the projects on their own even after (CARITAS) withdrawn. Integrated fish farming is being taken up by women.

Socio economic aspect: Women's participation in fish farming activities is steadily increasing. At present 43% of the beneficiaries engaged in aquaculture under CARITAS fisheries program are women. Infact they carry out all the activities as men do (decision making, earth cutting, pond preparing and management, feeding and fertilizing, keeping the accounts and records,

undergoing training etc.). The women groups are practicing test netting, fish harvesting and marketing. Few women groups have jointly and individually become owners of land. This has resulted in an improved social status and development of self-confidence amongst women. CARITAS has helped in networking of Government and non-government organizations, beneficiaries and rural arbitration.

CASE STUDY

A Dream of Mahmuda

Ms. Mahmuda Begum is always with a smiling face. She is a member of the Mahila Unnayan Mohila Samity at the village Labansaara, Union– Udayankathi of Banaripara under Barisal Region. Her husband works as a day laborer. They have three children and only 48 decimal lands in their homestead area. They have passed their days from hand to mouth. Though they are needy people but their relation is excellent and appreciable one.

Ms.Mahmuda got various training on fisheries, poultry, horticulture and sapling nursery from CARITAS in 1998. In front of their house, they had a small derelict pond. She re-excavated the pond with 12 decimal water area and 8 decimal dikes with the financial assistance of CARITAS IADP re-excavated component.

From May 1999, she started vegetables gardening on the embankment of the said pond. In July 99, she prepared the pond according to the suggestion of the CARITAS fisheries personnel and stocked fingerlings of carps and prawn in polyculture system namely: Catla-70, Silver carp-110, Rohu-108, Common & mirror carp-36 and Post Larvae of prawn-180.

She also followed the feeding schedule accordingly. She used to work regularly to apply feed and other necessary things and took care of the vegetables garden whenever necessary. In apportion of the dike, she established a plant

nursery with different species of timber and fruit plants.

According to her, "*When I stand on the green embankment of the pond and observe the playing of the growing-up fishes and plants, my heart filled with peace and happiness. I feel very proud*".

She spent Tk. 1,365 for pond aquaculture and Tk. 3,060 for setting up vegetables garden with sapling nursery up to December'99. She is earned a net profit of Tk. 10,000.

The income from the integrated fish farm helps her to meet some expenditures of the family *e.g.* education of he children, clothes, health etc. Fishes and vegetables were also used for family consumption. Mahmuda Begum simply said, "*Integrated fish farming is one of the best income Generating Projects which assist us to meet up our daily family needs*".

Now a day, she is proposing her husband regarding purchase a plot of land having an area of 20 decimal for implementing another integrated fish farm. She also believes that in near future they would be able to buy a piece of land using the income from this present pond project. And thus her dream would be materialized.

CASE STUDY

Fish culture increase my family income says Mrs. Sufla Chisim

Ms. Sufala Chisim is a member of Samniapara Uttara Mahila Samity of Haluaghat Thana. The group was formed in 1997 consisting of 15 homogenous women for uplifting their lifestyles. She lives with her husband having two daughters and two sons.

After joining in the group she received various kinds of training from CARITAS under DEEDS program. Moreover, she got training on improved fish farming. After receiving fish production training she was very much encouraged on fish farming and initiated in her unused pond. But she failed to produce

sufficient fish due to lack of proper technology and enough financial support.

In January 2000 she started a project on carp polyculture integration with dyke cropping in her 22 decimal pond and followed strictly the demonstration technology. She got financial support from CARITAS SARM project and received Tk. 3,700 for fingerlings stocking, feed and fertilizer in the pond.

As per guideline of the project she stocked 60 number fingerlings per decimal at the beginning of the season. The species of fingerlings are *Catla catla*, *Labeo rohita*, *Hypophthalmichthys molitrix*, *Cirrhinus mrigala*, *Cyprinus carpio*, *Ctenopharyngodon idellus*, and *Barbodes gonionotus* (Rajputi).

Moreover, she cultivated vegetables on the dyke having an area of 7 decimal and earned Tk. 3,250. She harvested about 400kg fish and sold them.

Now a day, her family members use to take fish on regular basis from her pond. She has realized "*Fish farming is an income source and opportunity for my family to change lifestyle.*"

Conclusion

Women play an important role in the fisheries sector of Bangladesh. This role encompasses social and economic activities and duties, both within and outside the family, including harvesting processing and marketing. It is imperative that to accelerate its development initiative an under developed country like Bangladesh needs to unleash the full potential of women. A social transformation must be engineered by changing power relations with the household and society. To achieve this, the government and its development partners need to re-orient their programs and implement an effective affirmative action for women.

About Editors

Dr. M. P. Singh Kohli is presently working as Professor & Head, Aquaculture Division of Central Institute of Fisheries Education (Deemed University), Mumbai. He did his Master's degree from RBS College, Agra and Doctorate from Gauhati University, Guwahati (Assam). Joined as Sr. Research Asstt. at Central Inland Fisheries Research Institute, Barrackpore in 1973 and worked in All India Coordinated Research Project on Reservoir Fisheries at Gobindsagar (HP) centre from 1973-76; as Scientist at Air-Breathing Fish Culture & Composite Fish Culture Projects at Bihar & Assam Centres from 1976-83. Worked as Sr. Scientist (Inland fisheries) at Central Agricultural Research Institute for Andaman & Nicobar Group of Islands, Port Blair from 1983-85 thereafter joined as Principal Scientist at CIFE, Mumbai and continuing since then. Published more than 40 research papers in national and international journals. Launched Indian Society of Fisheries Professionals during 1998, which has more than 200 life members presently. Under ISFP, organised First Indian Fisheries Science Congress at Chandigarh during Sept. 2000 and an International Conference on Women in Fisheries at Mumbai during Dec. 2001. He is also Hon. Chief Editor of ISFP International Journal 'Applied Fisheries & Aquaculture'.

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