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Gender mainstreaming paradigm in the context of Indian marine fisheries sector: elucidation of success cases

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ABSTRACT

The article explores the selected case studies pertaining to the paradigm of gender mainstreaming in Indian marine fisheries sector focusing attention on the gender equity and equality. Gender empowerment paradigm has been explored with emphasis on three pillars such as economic empowerment, well-being and decision making. The mariculture potential of India is vast as there is great scope for developing farming of shrimps, pearl oysters, mussels, crabs, lobsters, sea bass, groupers, mullets, milkfish, rabbit fish, sea cucumber, ornamental fishes, seaweeds etc. Although about 1.2 million ha is suitable for land based saline aquaculture in India, currently only 13 % is utilized. The mariculture technologies conspicuously being disseminated by Central Marine Fisheries Research Institute (CMFRI) with involvement of women and those possessing potential for women's participation include mussel farming, edible oyster farming, pearl oyster farming and pearl production, clam culture, lobster farming and fattening, crab farming / fattening, sea cucumber culture, marine finfish culture, ornamental fish culture, seaweed culture, open sea cage farming etc. The paper highlights six case studies on gender empowerment of weaker sections in marine fisheries sector based on the practical experience of the scientists in the marine fisheries sector which comprised case studies on women's Self Help Groups in Malabar Fisheries Sector, bivalve farming Self Help Groups of women in Kollam and Kasargod of Kerala, mussel farming Self Help Groups in Karwar of Karnataka, Institution-Village-Linkage Programme (IVLP) for Technology Assessment and Refinement, dry fish processing of women's Self Help Group and a fisher family's success story on crab fattening. The paper also highlights the gender issues and challenges in mariculture and marine fisheries sector in India. To ensure rapid economic development, removal of gender imbalances should be established as a priority. This would mobilize the remaining fifty percent of the country's human resources and would result in the smooth movement of the economic wheel. Integrating gender perspective in mariculture research and technology development is inevitable because the gender mainstreaming approach advances gender equality and equity in the society. As equity is a means and equality is a result, there is a genuine need for integrating gender perspective in development works or in mariculture extension also because women are the important stakeholders of our development process and our Extension system hardly targets the women folk for technological empowerment. These case studies can be used as case models and practical manual for promoting action and group empowerment in mobilizing SHGs in any key areas on a sustainable basis.

Key words: Gender Mainstreaming, Equity, Equality, Marine Fisheries, Group Dynamics Effectiveness, Case Study

Abbreviations: SHG: Self Help Group, GDEI: Group Dynamics Effectiveness Index, WID: Women in Development, GAD: Gender and Development, EEZ: Exclusive Economic Zone

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1. INTRODUCTION

The paradigm of 'Gender Mainstreaming' is a strategy articulated with gender and development goals and a commitment to gender equality in all aspects of policy and programme design and implementation which aims to transform the mainstream at all levels to end gender discrimination. Women in Development (WID) and Gender and Development (GAD) refer to two essentially different approaches to development. WID is based on the assumption that women are 'left out' of development, and need special projects to integrate them. GAD is based on gender analysis and sees gender equality as a fundamental development goal, with women's empowerment and agency as key features of development strategy. With regard to the women empowerment paradigm, according to Kieffer (1984), it is an interactive process which occurs between the individual and his environment, in the course of which the sense of the self as worthless changes into an acceptance of the self as an assertive citizen with socio-political ability. The outcome of the process is skills, based on insights and abilities, the essential features of which are a critical political consciousness, an ability to participate with others, a capacity to cope with frustrations and to struggle for influence over the environment. There is a point of view that women's empowerment may mean the loss of privileged position that patriarchy allotted to men. But as a prelude to this view, women's empowerment also liberates and empowers men, both in material and psychological terms. Women provide new insights, leaderships and strategies. Struggle of women groups for access to material resources and knowledge directly benefit men and children of the families and communities and a better quality of life. When women become equal partners, men are freed from the roles of gender stereotyping which limit their potential

Gender and Sex: Sex is the biological difference between women and men, whereas gender is the socially constructed differences between women and men.

Gender Discrimination: The systematic, unfavourable treatment of individuals on the basis of their gender, which denies them rights, opportunities or resources.

Content:
This study was undertaken as a part of the assignment to make a country paper in marine fisheries sector entrusted by the UPM (Universiti Putra Malaysia) the ASEM Aquaculture Platform WP7, workshop on 'Empowering Vulnerable Stakeholder Groups' organised in Kuala Terengganu of Malaysia during the period from 6th to 10th February, 2012 which focussed on gender and aquaculture and the policy makers and extension scientists who represented India in the workshop were the authors of the paper namely Dr.Vipinkumar,V.P, Senior Scientist, CMFRI, Kochi, Kerala, Dr.B.Meenakumari, Deputy Director General, (Fisheries), ICAR, New Delhi, Dr.P.Jayasankar, Director, CIFA, Bhubaneswar, Orissa and Dr.B.Shanthi, Senior Scientist, CIBA, Chennai, Tamil Nadu.

Women's Human Rights:
The recognition that women's rights are human rights and that women experience injustices solely because of their gender.

Gender equity and equality:
In simple terms, equity is the means and equality is the result. Equality is rights based in such a way that women and men have equal rights, enshrined in international standards and treaties and should have same entitlements and opportunities. Equity means justice so that resources are fairly distributed, taking into account the different needs of women and men.

Gender Analysis:
The systematic gathering and examination of information on gender differences and social relations in order to identify, understand and redress inequities based on gender.

personality development in men as much as in women. In addition to losing traditional privileges they also lose traditional burdens.

Fish is the cheapest source of animal protein and fisheries wealth of India is a huge bonanza. It has emerged as a giant industry. Its vast and varied fisheries resource includes 8129 km coastline, 29000km length rivers which includes 14 major river system, 44 medium rivers and innumerable small rivers and desert streams; 2,013,213 ha of flood plain lakes; 3.1 million ha of reservoirs, 2.254 million ha ponds and tanks and in the coastal area 1.2 million ha has been identified as potential resources for finfish and shellfish. This vast resource provides lifeline to more than 14 million people. About 3651 coastal villages' economy depends on fisheries activities. The Indian fisheries sector provides employment to over 12 million people engaged fully, partially or in subsidiary activities and play a major role in Indian economy. Women constitute nearly 50% of the total population and one third of labour force Fisheries contributed about 5% of Indian's GDP and about one per cent of the total GDO during 2008-09. The sector supports livelihood options for about 40 million people in India. The marine fishery resources of the country include a coastline of 8129 km with numerous creeks and saline water areas, an Exclusive Economic Zone (EEZ) of 2.02 million km^2which are suitable for capture as well as culture fisheries. The annual harvestable marine fishery resources in the Indian EEZ have been estimated at about 3.93 million tones constituting more than 50% demersal, 43 % pelagic and 6% oceanic groups. (Rao Syda, 2011) The Indian fish production is contributed by marine and inland sectors.

The essence of census of Indian Marine Fisheries Sector 2010 specifies that, there are 3,288 marine fishing villages distributed among the nine maritime states and the union territories of Puducherry and Dan & Diu. Marine fishermen households were 8,64,550, of which 1,92,697 are in Tamil Nadu, 1,63,427 were in Andhra Pradesh and 1,18,937 were in Kerala. Among the marine fishermen households 7,89,679 (91.3%) were traditional fishermen families. Nearly 61 % of the marine fishermen families kin the country (5,23,691) were below the poverty line. Total marine fisherfolk population was 3,999,214. Overall sex ratio was 928 females per 1000 males and was below 1000 in all maritime states. Sex ratio was maximum in Puducherry (982) and the minimum in West Bengal (865). Regarding education, 57.8% of fisherfolk were educated with different levels of education and with regard to occupation, 37.8 % were engaged in active fishing with 83.4 % having full time engagement. About 2.4 % were engaged in fish seed collection of which 54.4 % were full time. Nearly 81.8 % of fisher folk in marketing, 88.1 % in curing and processing and 89.6 % in peeling were women. Looking into the religions demarcation, 75.47 % were Hindus, 15.21% Christians and 9.28% were Muslims. Hindus were the dominant religion among marine fishermen households in all the maritime states and union territories except Kerala. Overall % of SC/ST among the marine fishermen households was 16.6% and 32 % of adult fisherfolk had membership in co-operatives. As much as 131,012 families were having life saving equipments. There were 1,94,490 crafts in the fishery out of whti9ch 72,559 (37.3%) were mechanized,71,313 (36.7%) motorized and 50,618 (26.3%) non-motorized. Out of the total mechanized crafts owned by the fisherfolk 28.9% were trawlers, 42.8% gillnetters and 19.1% were dolnetters. Marine fish landing centres were 1,511. Among the motorized crafts, 60.3 % were fibre glass boats, 12.5 % plywood boats and 10.3 % plank built boats and 8.9 % were catamarans. An increase of around 1 lakh fisherfolk families was noticed in 2010 compared to 2005. Around 6.4 lakhs of fisher families did not possess any kind of craft, 5.21 lakhs were without any fishing gear and around 5 lakhs had neither. The number of fisher families wherein only women were involved in fishing and allied activities was 41,000 which was a 17% increase of the corresponding 2005 figure (CMFRI, 2010).

Speaking the paradigm of 'Women empowerment', it is a 'bottom-up' process of transforming gender power relations, through individuals or groups developing awareness of women's subordination and building their capacity to challenge it. Empowerment basically refers to the process of raising women status by way of promoting economic, social, political and local empowerment. Empowerment is a process of awareness and capacity building leading to greater participation to greater decision making powers and control and to transformative action. The goals of women empowerment are to challenge patriarchal ideology, to transform the structures and institutions that reinforce and perpetrate gender discrimination and social inequality and enable poor women to gain access to and control over both material and information resources. The paradigm of empowerment means increasing the social, political, spiritual or economic strength of individuals and communities. A lot has already been echoed in the mainstream media and research perspective about the significance that gender equality and empowerment of women play in the overall modernization of any society. Empowering women in a society where they have been treated like doormats for centuries is a Herculean task. There is bound to be an internal resistance practically. It would be pertinent to make an attempt for the practical empowerment of women in the context of community development. International Fund for Agricultural Development (IFAD) considers three pillars to achieve gender equality and women's empowerment, which include

1) Economic empowerment: Improving women's access to income-earning opportunities and productive assets.

2) Decision-making: Increasing women's say in community affairs and strengthening women producers' organizations.

3) Well-being: Improving access of rural people, in particular women, to basic services and infrastructure.

With these perspectives, under the UPM (Universiti Putra Malaysia) the ASEM Aquaculture Platform WP7, workshop on 'Empowering Vulnerable Stakeholder Groups' was organised in Felda Residence of Kuala Terengganu of Malaysia during the period from 6th to 10th February, 2012. As the workshop focussed attention on gender and aquaculture looking into consideration in equity and equality, the men and women participants were equal in number i,e 14 each with the funding under the University Putra Malaysia. The team of policy makers and extension scientists participated in the workshop from India consisted of the authors of the present paper such as Dr.B.Meenakumari, Deputy Director General, (Fisheries), ICAR, New Delhi, Dr.P.Jayasankar, Director, CIFA, Bhubaneswar, Orissa, Dr.B.Shanthi, Senior Scientist, CIBA, Chennai, Tamil Nadu and Dr.Vipinkumar,V.P, Senior Scientist, CMFRI, Kochi, Kerala (Photograph 1) The major topics covered were basic understanding of gender, poverty eradication policy and programme, gender issues in development, gender issues and barriers in aquaculture, gender analysis tools : livelihood analysis, development context, stakeholder analysis, empowering vulnerable stakeholders, gender mainstreaming and budgeting, gender disaggregated data, scaling up, best practices in aquaculture food production, logical framework analysis and action plan preparation and presentation including an explorative filed visit to entrepreneur ventures of women and Fisheries University at Kuala Terengganu.

The conspicuous mariculture technologies being disseminated by Central Marine Fisheries Research Institute (CMFRI) with involvement of women and those possessing potential for women's participation include mussel farming, edible oyster farming, pearl oyster farming and pearl

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Photograph 1

Indian Participants in the workshop: Dr.P.Jayasankar, Dr.B.Meenakumari, Dr.V.P.Vipinkumar and Dr.B.Shanthi.

Photograph 2

Women SHG members of Mussel farming in Malabar of Kerala

Photograph 3

Bivalve culture by women's Self Help Group in Kollam of Kerala

production, clam culture, lobster farming and fattening, crab farming / fattening, sea cucumber culture, marine finfish culture, ornamental fish culture, seaweed culture, open sea cage farming etc. As the present study focused on elucidation of success cases on gender mainstreaming paradigm pertaining to Indian marine fisheries sector, a couple of cases from the practical experience of the scientists representing the marine fisheries sector were narrated with the consultation of the Indian team of the workshop. Naturally the practical implications of a couple of technologies of the CMFRI practiced by the fisherfolk based on the research experience of extension scientists were explored as success cases. CMFRI established in 1947, in India has been carrying out pioneering research and development work in the arena of marine fisheries with the objectives of ensuring fisheries resource, ecosystem and livelihood sustainability in the country. Since 1971, the headquarters of the Institute is in Kochi, Kerala State. Presently the Institute has three regional Centres at Mandapam Camp of Tamil Nadu, Visakhapatnam of Andhra Pradesh and Veraval of Gujarat. Research Centres are located at Mumbai, Karwar, Mangalore, Calicut, Vizhinjam, Tuticorin and Chennai. In addition to these there are fifteen field centres throughout the coastal belts of the country. The infrastructure and research facilities at the headquarters and research centres include three sea-going vessels, five research hatcheries, four marine aquaria, three biodiversity museums, state of art research laboratories including an electron microscope, an Agricultural Technology Information Centre (ATIC), Agricultural Research Information Service Cell (ARIS), a well equipped library with server, a Krishi Vigyan Kendra (KVK), farmers' rest rooms, students' hostels, marine farm. etc. The vision of CMFRI focuses on sustainable marine fisheries through management intervention and enhanced coastal fish production through mariculture for improved coastal livelihoods with the major mission to develop information based management system for changing over from open access to regulated regime in marine fisheries, augment costal fish production through mariculture and sea ranching and restore critical marine habitats. The mandate focuses on monitoring the exploited and assess the under-exploited of the marine fisheries resources of the Exclusive Economic Zone (EEZ), understanding the fluctuations in abundance of marine fisheries resources in relation to change in the environment, developing suitable mariculture technologies for finfish, shellfish and other culturable organisms in open seas to supplement capture fishery production, acting as a repository of information on marine fishery resources with a systematic database, conducting transfer of technology, post graduate and specialized training, education and extension education programmes and providing consultancy services.

2. SCOPE OF THE STUDY

As the present study dealt with the elucidation of success cases on gender mainstreaming in Indian marine fisheries sector, in a descriptive way, focusing attention on the gender equity and equality emphasized in the Indian context, there is ample scope to explore the gender empowerment paradigm along with emphasis on the three pillars such as economic empowerment, well- being and decision making. Looking into the policy and programs for aquaculture development in India, it could be observed that the production from marine sector has almost attended the plateau where as aquaculture has a great potential. Being an important stakeholder of fisheries sector women shoulders various roles. Traditionally fisher women (women belonging to particular caste, sub-caste, etc.) are important stakeholders in fish processing and marketing. With increase in awareness level among women on economic activities and dissemination of aquaculture techniques, rural women from other caste have joined the fishery sector. Now we find women besides their reproductive rules, assumed new roles in scientific fish culture, processing and marketing. Women constitute 50% of the total population and comprise one-third of the labour force. So the development of our country cannot be assured leaving behind this large

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Micro-enterprise: An activity which requires less capital, less manpower, local raw materials and local market.

Group Dynamics: The internal nature of the group as to how they are formed, what their structures and processes are, how they function and affect individual members, other groups and the organisation.

Self Help Group: The group in which members are linked together by a common bond like caste, sub-caste, blood, community, place of origin or activity which provides the benefits of economies in certain areas of production process by undertaking common action programmes like cost effective credit delivery system, generating a forum for collective learning with rural people, promoting democratic culture, fostering an entrepreneurial culture, providing a firm base for dialogue and co-operation in programmes with other institutions, possessing credibility and power to ensure participation and helping to assess the individual member's management capacity.

population. Though it is largely accepted that the role of women in fisheries sector limited to processing and marketing, then role in other activity like aquaculture cannot be totally ignored. On other hand their participation in this sector is needed to be strengthened for better production. The fisheries activities are broadly categorized into capture and culture and the processing is coming up as a separate industry. The resources under capture and culture include – marine, brackish and fresh water. Whereas capture fisheries dominate the marine sector, culture activity dominates inland waters. During last five decades the fisheries sector witnessed a continuous rise with a paradigm shift in the production scenario from that of marine to inland fisheries and aquaculture is gaining priority over capture fisheries. Production of fish from capture sector (with marine and fresh water) has been stagnant for nearly a decade. Hence, the demand shifted automatically to the aquaculture. Aquaculture has shown a continued expansion since 1980s and established a better position among food production sector. Its growth rate registered more than 6%, which is higher to the production of food grains, milk, eggs and many other food items.

Like any other sector of agriculture, women participation in aquaculture remains largely unnoticed. When the question of adoption of new technology comes the women are rarely considered a target group. But since women constitute 50% of total population, negligence to bring them to the front line action is always a negative approach to the total development process. It is estimated that women carry out almost 70% of agricultural workload, but in aquaculture, their role has not been properly identified. May be it is due to the ignorance of women about the technology, cultural and social barriers, women perception and so on. Women's role in fisheries is very significant and there is gender bias in respect of their works. This discrimination may be noted out from the country's scenario through the economic upliftment of fisherwomen through appropriate policies, programmes and projects. The inequalities between men & women in rural India are observed in the social, cultural and economic lives and are being maintained in the society through various forms of bias. But they are the important stakeholders of our development process. Extension system hardly targets the women folk for technological empowerment. Women participation in fishery sector is age old. But they are still engage in traditional method of processing and marketing. Their participation in culture sector is not yet properly defined. Aquaculture is a developing sector and women participation in this sector needs a meticulous planning for technological empowerment encompassing the social and economic barriers. On farm trials conducted by DRWA, CIFA, CIBA and CMFRI have brought out the strong motivation and capability among women for taking up aquaculture (Freshwater, brackish-water and Marine). Empowering women in different aquaculture practices (Freshwater and brackish-water) can provide suitable option for sustained economic and nutritional security of the family and thereby an in depth observation on these dimensions made through the present study has ample scope to explore the paradigm of gender balance and women empowerment based on views of Gender and Development (GAD) and Women in Development (WID).

Rational utilization of common property resources for sustainable development without endangering the environment is possible through community participation. The development and empowerment of weaker sections and gender mainstreaming in the Indian fisheries sector in a broader visualization will be materialised to a great extent with poverty eradication programmes though the transparent media namely Self Help Groups. Self Help Groups can play a vital role for the fisheries sector development. The utmost important requisite for this is ensuring participation of fisherfolk especially women in the planning and implementation of various coastal sector development programmes. The open access regime existing in the harvesting of marine fishery resources in our country warrants stronger emphasis on invoking technological innovations as well as management paradigms that reconcile livelihood issues with concerns on resource conservation. Being the premier Marine Fisheries Research Institute in India with more than 6 decades of service to the nation, the Central Marine Fisheries Research Institute (CMFRI) suggests ways and means to sustain the potential source of food in capture and culture fisheries and their optimum utilisation (Modayil et al., 2008). Innovations do not happen in a socio-political vacuum. It is the extent of partnership between the research and the client system that decides the fate of any technology in terms of its adoption or rejection.

2.1. Methodology

As this is basically a descriptive study on the practical case studies on gender mainstreaming in marine fisheries sector, the data gathering protocols on gender mainstreaming were standardized with major variables and dimensions to be quantified for the data collection with expert consultation and local enumerators trained for data collection in the potential pockets where mariculture technologies were disseminated were used to gather primary data. Similarly the secondary data collection also contributed a vital role. Data were collected on socio economic and behavioural aspects from fisherfolk respondents among the different types of identified stakeholders under primary, secondary and tertiary sectors throughout the country in the study locations of the mariculture technology. The information was essentially gathered through secondary data collection and triangulation done in consultation with major sources of information such as the fishermen co-operative societies, Self Help Groups of fisherfolk, through the survey staff of the Fishery Resource Assessment Division of CMFRI and marine fisheries census reports of CMFRI. Data were also gathered on demographic characteristics and elucidated specific case studies of women in mariculture sector. A true introspection of the livelihood of women fisherfolk mobilized as Self help Groups in the selected mariculture locations was also undertaken in the present study. The dependent variables like Group Dynamics Effectiveness of SHGs were measured by developing appropriate indices like GDEI (Vipinkumar and Singh, 1998) and arbitrary scales developed for assessment of gender perspectives like participation profile, constraint analysis etc. A couple of case studies on dynamics of Self Help Groups engaged in bivalve farming are explored here.

3. RESULTS

As the present research study focused on elucidation of success cases on gender mainstreaming paradigm in the context of marine fisheries sector, the results are presented in three narrative cases described below.

3.1. Case study of Women's Self Help Groups in Malabar Fisheries Sector

The contribution of women in fisheries sector is substantial, especially in various subsidiary activities of capture fisheries such as processing, value addition, sorting, grading, peeling, trading and aquaculture practices ranging from breeding and rearing of fish to marketing. The coastal fishing communities are almost solely depending on the sea resources for their livelihood and the roles that Self Help Groups of women fisherfolk in the marine fisheries sector mobilized with a suitable micro-enterprise in fisheries and diversified sectors are pivotal for the maintenance and economic prosperity of their families. Microfinance institutions play a vital role in reducing the coastal indebtedness in marine fisheries secotor (Vipinkumar et al., 2013). Women households are the real victims of deprivation and destitution. Therefore, any programme for poverty alleviation must aim at improving the living environment of the womenfolk. It is through creating livelihood opportunities Poverty alleviation schemes based on micro-credit system have been implemented in many of the developing countries in recent years. In all developing countries state actions are being reinforced in streamlining poverty alleviation programmes. The institutional formations of various means are also invigorated for initiating schemes of poverty alleviation successfully (Yaron, 1992; Yunus, 1999).

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Table 1
Selected SHGs', location, micro enterprise and GDEI Score

District	Name of SHG	Location	Micro enterprise	GDEI Score
Kasargod	Kairali	Cheruvathur	Bivalve farming	61.7
	Ori unit	Padanna	Bivalve farming	79.1
	Vedavyasa	Kottikkulam	Fish drying & value addition	57.2
Kannur	Seafood unit	Thayyil	Fish drying & value addition	68.8
	Krishnamadham	Mattul	Fish drying & value addition	59.6
	Chaithanya	Ayikkara	Fish Processing & value addition	52.8
Kozhikkode	Kasthurba	Chombal	Fish processing & value addition	67.1
	Samudra	Virunnukandy	Fish processing & value addition	47.2
	Snehatheeram	Beypore	Fish drying & value addition	57.4
Malappuram	Yuvasakthi	Puthupponnani	Bivalve farming	67.0
	Arafa	Ponnani	Fish drying & value addition	65.8
	Soorya	Marakkadavu	Fish Processing & value addition	56.8

Table 2
Ranking for priorities of fisherfolk for fishery based micro enterprises

No	Fishery based micro enterprise	Preference Rank of respondents			
		Kasargod	Kannur	Kozhikkod	Malappuram
1.	***Preparation of Value Added products***	III	V	I	I
2.	Preparation of Dry Fish products	IV	I	III	V
3.	Fish Processing Unit	V	II	II	IV
4.	Ready to eat fish products	VI	VI	V	VI
5.	Ready to cook fish products	VII	VII	VI	VII
6.	Ornamental Fish culture enterprise	VIII	IX	VII	VIII
7.	Mussel culture	I	III	IV	II
8.	Clam collection	XI	IV	IX	IX
9.	Edible oyster culture	II	VIII	VIII	III
10.	Pearl culture	X	XI	XI	X
11.	Mud Crab culture	IX	X	X	XI
12.	Cage culture	XII	XII	XII	XII

Table 3
Ranking for priorities of fisherfolk for diversified micro enterprises

No	Agri - based micro enterprise	Preference Rank of respondents			
		Kasargod	Kannur	Kozhikkod	Malappuram
1.	***Vegetable farming***	I	II	I	I
2.	Ornamental Gardening enterprise	III	I	III	III
3.	Floriculture	IV	V	II	IV
4.	Kitchen garden	VI	VI	V	VI
5.	Orchards	VII	VII	VI	VII
6.	Fruit products	VIII	IX	VII	VIII
7.	Fruit Processing	V	III	IV	II
8.	Snacks bar	XI	IV	IX	IX
9.	Catering Unit	II	VIII	VIII	V
10.	Bakery Unit	X	XI	X	X
11.	Cereal Pulverizing Unit	IX	X	XI	XI
12.	Sericulture Unit	XIII	XIII	XII	XIII
13.	Planting mangroves & acacia trees	XII	XII	XIII	XII
14.	Coconut processing/oil extraction unit	XIV	XIV	XIV	XIV
15.	Vanilla nursery	XV	XV	XV	XV
Allied sector based micro enterprise					
16.	Grocery repacking	II	I	I	I
17.	Garment unit	I	II	II	II
18.	Soap unit	VII	IV	III	IV
19.	Wood – Stone carpentry	VIII	IX	X	XII
20.	Computer centre	IX	X	IV	VIII
21.	Cattle unit	XIII	XII	XIII	IX
22.	Poultry unit	XII	XI	XI	X
23.	Hand weaving	V	III	XII	XI
24.	Candle unit	III	VII	V	VII
25.	Chalk Unit	IV	VI	VII	VI
26.	Umbrella Unit	VI	V	VI	V
27.	Foam Bed Unit	X	VIII	VIII	III
28.	Bamboo based handicrafts	XIV	XIV	IX	XIV
29	Firewood	XI	XIII	XIV	XIII
30.	Beauty parlour	XV	XV	XV	XV

The Self Help Groups (SHGs) organized by women fisherfolk do play a vital role in fisheries sector of maritime states of Indian coastal belts. It is a matter of great concerns that, despite the economic and socio cultural significance of fishing in Kerala state, the women fisherfolk at large are outside the mainstream of the society in the economically disadvantaged category without accruing the benefits from fishing industry (Kurien, 1994). Malabar areas of Kerala always stand backward and less progressive than the rest of Kerala and about half of the coastline of Kerala state is of Malabar (MCITRA, 2003). But fisherfolk especially women rarely gain the benefits even when there is tremendous consideration for fish production because fisheries

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Women Empowerment:: Empowerment basically refers to the process of raising women status by way of promoting economic, social, political and local empowerment. It is a 'bottom-up' process of transforming gender power relations through individuals or groups developing awareness of women's subordination and building their capacity to challenge it.

development was most often discriminated from the development of fishing community. As it was felt as pertinent to have a look into the group dynamics of the existing Self Help Groups mobilized by the development agencies for empowerment of women fish workers in Malabar fisheries sector, an attempt was made to elucidate a case study on this. The SHGs', whether is a temporary phenomenon, or would continue on a sustainable basis was analysed and probed (Fernandez, 1995). The constraints were to be addressed and empowerment should be brought about by adopting suitable economically viable micro enterprises in fisheries and allied sectors by strengthening of these SHGs.

A Self Help Group (SHG) consists of members linked by a common bond like caste, sub-caste, community, place of origin, activity etc. The Group Dynamics of these SHGs refer to the interaction of forces between the members. It is the internal nature of the groups as to how they are formed, what their structures and processes are, how they function and affect the individual members and the organization (Lewin et al.1960). In an intensive study of Group Dynamics, Pfeiffer and Jones (1972) identified the Group Dynamics factors as to how the group is organised, the manner in which the group is led, the amount of training in membership and leadership skills, the tasks given to the groups, its prior history of success or failure etc. In a detailed study of Group Dynamics, Hersey and Blanchard (1995) gave emphasis on helping and hindering roles individuals play in groups such as establishing, aggressive, persuading, manipulative, committing, dependent, attending and avoidance.

This case study in Malabar essentially focused on the major objective of assessing the Group Dynamics of the SHGs of women fisherfolk and identifying the important dimensions contributing to their effectiveness and assessing the influence of personal and socio psychological characteristics on Group Dynamics. It also took care of assisting in empowerment of women's SHGs through training and adopting economically viable micro enterprises in fisheries & diversified sectors and elucidating success cases of SHGs and identifying the constraints faced by the women fisherfolk and thereby developing a strategy for mobilizing and strengthening an effective SHG. The study was undertaken in 4 districts in Malabar of Kerala state namely Kasargod, Kannur, Kozhikkode and Malappuram. From each of the district, 3 SHGs of women fisherfolk at random were selected, comprising a total of 12 SHGs. From each SHG, 15 women were personally interviewed by a pre tested interview schedule. The Group Dynamics of each SHG was quantified by developing the index called Group Dynamics Effectiveness Index (GDEI), which was operationally defined as the sum-total of the forces among the member of SHG based on the sub-dimensions, such as participation, influence & styles of influence, decision making procedures, task functions, maintenance functions, group atmosphere, membership, feelings, norms, empathy, interpersonal trust and achievements of SHG (Vipinkumar and Singh, 1998). All these 12 dimensions were measured by a set of inventories containing appropriate questions (Pfeiffer and Jones, 1972). The total score of GDEI for an individual was obtained by adding the individual scores of each component together. The details of the selected 12 SHGs, location in the four districts in Malabar, the corresponding micro enterprises and the GDEI Score are presented in Table 1. Steps were taken subsequently to empower those groups with lowest score of GDEI and success case studies on empowerment of women's SHGs' were elucidated from those groups with highest score of GDEI in each district of Malabar (Photograph 2).

3.1.1. Micro enterprises in Fisheries and diversified sectors

Empowerment programmes were undertaken in each district for the SHG with lowest score on GDEI on suitable micro enterprises in fisheries and allied sectors, based on the preference ranking of the SHGs. Preference ranking of micro enterprises according to location specific suitability in fisheries and allied sectors in all the 4 districts was done and appropriate micro enterprises were listed out as follows: (Table 2 and 3). A perusal of the table 2 reveals the potential of bivalve farming, processing, drying and value addition as fishery based micro enterprises. In bivalve farming, mussel culture has immense potential in Malabar fisheries sector (Vipinkumar et al, 2001). Table 2 reveals that among agricultural based enterprises vegetable farming, ornamental gardening and floriculture are of greater preference in Malabar. Among allied sector micro enterprises, grocery repacking, garments unit etc. had tremendous potential. A micro enterprise is an activity which requires less capital, less manpower, local raw materials and local market. It is an individual enterprise whether known or unknown (Vedachalam, 1998). Preference ranking based on the suitability of the locations in Northern coastal belts of Kerala for 12 fishery based micro enterprises, 15 agri-based micro enterprises and 15 allied sector micro enterprises are presented in Tables 2 and 3. In fisheries sector, for the upliftment of fisherfolk below the poverty line, some successful micro enterprises developed based on the location specific resource availability and experience and some alternate avocations and subsidiary entrepreneurial ventures successfully being undertaken by Self Help Groups in coastal sectors and allied areas as follows: Value added fish producing units, Dry fish unit, Fish Processing unit, Ready to eat fish products, ready to cook fish products, Ornamental fish culture, Mussel culture, Edible oyster culture, Clam collection and Cage farming are very important. In agricultural sector, Vegetable cultivation, Ornamental gardening, Floriculture, Kitchen Garden, Orchards, Fruit products, Fruit processing, Sericulture, Mushroom cultivation, Medicinal Plants, Vermi-compost, Snacks units, Catering Units, Bakery Units, Cereal Pulverizing units are some micro enterprises undertaken by women's Self Help Groups (Vipinkumar, 2005).

Similarly, the micro enterprises those the SHGs can generally bring to practical utility in allied sectors based on the resource availability and circumstances are Wood work units, Stone work units, Soap units, Garment units, Computer centre, Poultry centre, Cattle rearing, Piggery unit, Bee Units, Stitching units, Hand Weaving Units, Candles, Chalks, Umbrella units, Foam Bed Units, Bamboo based handicrafts, Paper cover, Scrape selling, Vegetable seeds, Marriage bureau, Medicine collection, Patients service, Real estate, Medicine processing, Direct marketing, Coir Brush, Plastic weaving, Second sails, Meat *masala*, *Rasam* powder, Curry powder, Pickle powder, *Sambar* powder, Consumer service centres, Home delivery package, Repacking business, Cleaning powder, Phenol lotion, Liquid soap, Washing soap, Toilet soap, Kids' garments, Toffee & Sweets, Photostat, Washing powder of best quality and medium type, Emery powder, Domestic animals, Nursery plants, Note book, Book binding, Rubber slipper production, Pillow cushion, Incense stick production, Cloth whiteners, Eucalyptus oil, Dolls, Hand shampoo, Soap shampoo, detergent shampoo, Jackfruit jam, Chips, Hotel, Catering service, Grape wine, Pineapple wine, Soft drinks, Chicken farming, Dried mango wafer, Dried chilli, Gooseberry wine, Ginger wine, *Papads*, Tomato sauce, Day care centre, Coconut water vinegar, Syrups, Artificial vinegar, Mixed fruit jam, Milk chocolate, Tomato squash, Gum production, Cleaning lotion, Soft drink shop, Reading room, Private tuition, Counseling-guidance, Rent sales, Paying Guest service, Repairing centre and handicrafts are some of the employment opportunities that the SHGs can venture throughout Kerala depending on the suitability of situations and availability of resources.

In reality, the suitability of the micro-enterprise varies from situation to situation. The essential features for the success of a viable micro enterprise are: the availability of sufficient quantity of raw materials locally, the identified enterprise is known or easy to learn and practice, the cost of production must be low, the products must be of very good quality, the availability of market for the products. The important financial organizations giving financial assistance to SHGs are Khadi Village Industries Board, Department of Commerce & Industry, *Jawahar Rosgar Yojana*, Women

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Table 4
Ranking of constraints of women fisherfolk in Malabar

No	General Constraints	Rank assigned by respondents (n = 180)			
		Kasargod	Kannur	Kozhikkod	Malappuram
1.	Poor living conditions & livelihood security	I	I	I	I
2.	Educational Illiteracy	II	II	II	II
3.	Lack of proper employment	IV	III	III	IV
4.	Socially unorganized set up	III	IV	V	III
5.	Gender inequality	VI	VI	IV	V
6.	Alcoholism of men fisherfolk & exploitation	V	V	VI	VI
7.	Health problems	VIII	VII	VII	VII
8.	Scientifically less advanced	VII	VIII	VIII	IX
9.	Cultural bonding, customs, traditions, conservatism	IX	IX	IX	VIII
	Constraints of SHG	**Rank assigned by respondents (n = 180)**			
10.	Marketing is a tough task	I	I	I	I
11.	Choosing Diversification difficult	III	IV	III	II
12.	Sustenance difficult	IV	II	II	III
13.	Hectic procedures in preparing minutes, reports, meetings, banking etc.	II	III	IV	IV
14.	SHG became an additional burden	V	V	V	V

Table 5
Relationship of Cost estimates and GDEI of selected Self Help Groups

SHG	Cost (Rs)	Returns (Rs)	BC Ratio	GDEI score	Correlation Coefficient (r)	Significance (2-tailed)
SHG 1	32,355 /-	40,000 /-	1.236	52.78	0.863**	0.001
SHG 2	50,415 /-	64,000 /-	1.269	54.33		
SHG 3	37,950 /-	48,000 /-	1.265	53.91		
SHG 4	45,550 /-	60,000 /-	1.317	57.32		
SHG 5	55,590 /-	72,000 /-	1.295	55.68		
SHG 6	43,095 /-	58,000 /-	1.346	60.08		
SHG 7	32,000 /-	42,000 /-	1.312	59.14		
SHG 8	31,750 /-	40,500 /-	1.275	57.78		
SHG 9	32,500 /-	42,000 /-	1.292	59.16		
SHG 10	32,850 /-	44,500 /-	1.354	60.17		

Industrial Cooperative Societies, Kerala State Social Welfare Advisory Board, Kerala Financial Corporation, National bank of Agriculture and Rural Development, District Rural Development Agency, other Non Government Organizations, *Kudumbasree ayalkoottam* groups etc. This is a typical Case Study elucidated exclusively of women in fishery based micro-enterprises.

Gender Needs: Shared and prioritised needs identified by women that arise from their common experiences as a gender.

3.1.2. Constraints of Women fisherfolk of Malabar

The constraints in general as well as those faced by the women fisherfolk as members of SHG, as per their order of importance in the perception of respondents in Malabar are presented in table 4. Rather than the general constraints such as poor living conditions, illiteracy, unemployment etc, more stress was given on the constraints faced by the SHGs' as it is pertinent for the present study. Marketing aspect was perceived to be the biggest constraint of the SHGs' rather than procedural hurdles of preparing minutes, reports, meetings, banking etc. From these priorities and constraints it is obvious that it is high time for diversification of micro enterprise in additional to fishery based ones in these SHGs' for sustenance. Many SHGs of women fisherfolk have already diversified in these enterprises in Malabar fisheries sector.

3.2. Case study on Bivalve Farming Self Help Groups of Women in Kollam and Kasargod of Kerala

This study was undertaken in two panchayats namely Cheruvathur and Padanna in Kasargod district and Thekkumbhagam and Neendakara in Kollam district (Photograph 3). Bivalve farming (especially mussel & oyster culture) offers good scope for development in our open waters for enhancing food and livelihood security of the stakeholders in our coastal agro climatic zones. Mussel culture has already been proved as one of the profitable enterprises in the coastal belts as a subsidiary income-deriving source of coastal fisherfolk. The experimental trials conducted by CMFRI have proved the techno-economic feasibility of mussel farming (Vipinkumar et al, 2001, Vipinkumar and Asokan, 2008, 2011). As much as 200 households undertaking bivalve farming were selected and male and female counterparts in each household were separately interviewed, comprising a total of 400 respondents. The data regarding gender participation in different activities, gender needs, decision making and access and control over the resources in respect to bivalve culture were collected through personal interviews of the respondents with the help of a pre-tested well structured interview schedule. In addition to this, 10 women SHGs engaged in bivalve culture, five each from the above districts were randomly selected to measure the Group Dynamics. The Group Dynamics of SHGs was measured by the index GDEI developed by Vipinkumar and Singh (1998) with appropriate modifications suitable for the present context. The Benefit-Cost ratio was analysed in each group and cost estimates were also worked out. The problems and constraints faced by the women were also assessed in each case and listed out. The relationship of Benefit Cost estimates and GDEI of selected SHGs is presented in Table 5. The study, focused attention on Group Dynamics Effectiveness as a trait of SHGs resulted by the joint influence of individual members of the group generated out of skills and orientations from the past life experiences. It definitely varies from person to person, place to place, time to time, situation to situation and in turn from group to group. This might be the probable reason for the differential degree of GDEI observed among respondents.

3.2.1. Cost estimates of bivalve farming Self Help Groups

The major expenditure required for bivalve farming is for the materials such as bamboo, nylon rope, coir, cloth, seed, etc. and labour costs essentially cover construction, seeding, harvesting etc. The women's groups constituted in the

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Table 6
Profile of Participation in gender perspective in bivalve farming (n = 400)

Activity	Man(Independently)		With Man		With Woman		Women(Independently)	
	Female	Male	Female	Male	Female	Male	Female	Male
Accounting and Record Keeping	6.5	6.03	37	24.12	34.5	46.73	22	23.12
Aftercare	16.5	16.58	74.50	50.25	6	28.14	3	5.03
Arranging Bamboo Poles	43	17.09	51.5	76.38	1	0.5	4.5	6.03
Arranging Ropes	30.65	16.58	65.33	64.82	1.51	14.07	2.51	4.52
Arranging Seeding Nets	25	16.08	65	62.81	8	17.09	2	4.02
Canoeing to the sites	43.72	26.13	53.27	70.35	0.5		2.51	3.52
Disposal of shell	8	2.01	34.5	18.59	35.5	57.79	22	21.61
Harvesting	19	17.09	71.00	49.75	5	25.13	5	8.04
Hiring Canoes to Estuary / Sea	44.72	28.14	52.76	66.83		1.01	2.51	4.02
Marketing of live Mussel	17.5	1.51	23	27.14	37	48.74	22.5	22.61
Marketing of Shucked Mussel	17	1.51	20	26.13	40.5	49.75	22.5	22.61
Meat Shucking	7.5	1.51	28	27.64	42	47.74	22.5	23.12
Mussel Spat Collection	48	27.64	30	49.75		0.5	22	22.11
Post Harvest Operation	19	5.03	38.5	43.72	19.5	28.64	23	22.61
Raft Construction	33.67	22.61	56.78	61.81	4.52	11.56	5.03	4.02
Seeding Rate and Seeding	23.62	17.59	65.83	57.79	7.54	19.6	3.02	5.03
Site Selection	49	34.17	28	35.68	1	8.04	22	22.11
Transport to shore	36.5	16.58	41.5	58.29	3	6.53	19	18.59
Tying the Seeded Ropes to the raft	28.14	15.58	43.22	54.77	23.12	24.62	5.53	5.03
Total	27.2	15.23	46.28	48.77	14.23	22.96	12.28	13.04

scheme Development of Women and Children in Rural Areas (DWCRA) started mussel farming as early as 1996-97 and were assisted by loan amount worth Rs 8800/- per member with a subsidy of 50 % of the loan. The duration of the loan is 5 years and the rate of interest is 12.5 % per annum. In addition to this, a revolving fund of Rs 5000/- was also provided without interest. When the SHGs are economically empowered with the provision of loan facilities, the returns from mussel farming help them to repay the loan slowly. The loan was granted through Farmers' Service Cooperative Banks and North Malabar Gramin Banks in Cheruvathur and Padanna panchayaths of Kasargod district. Majority of the SHGs showed considerable progress in repayment of the loans, which may be concluded as an indication of the profitability of mussel farming. The expenditure details of the selected SHGs in the initial year of mussel cultivation are also shown in Table 5. The BC Ratio of SHGs was found as substantially good which proves the profitability of mussel farming in the first crop itself and since in the subsequent years, material costs such as those of bamboo, rope, cloth and labour cost in construction etc. are negligible, this ensures reasonable profit and adoption of mussel farming enterprise bringing about economic empowerment of rural women through organised Self Help Groups. Experiences and observations already indicated that for a group to be developed as an SHG, it requires a period of at least 36 months and it is a hectic process. It has to pass through various phases such as Formation phase, Stabilisation phase and Self Helping phase. These SHGs promote a cooperative and participative culture among the members, which ensures the empowerment culture of the Self Helping phase. The loan sanctioning, utilisation, accounts maintenance and timely repayment of loans etc. are all systematically accomplished with proper maintenance of the documented records by the group members. This ascertains the fulfillment of norms and standards of the SHG leading to economic empowerment of the members. Table 5 also presents the relationship of Cost estimates and GDEI. The average yield in Kg per metre length of the rope recorded in all SHGs also showed a positive relationship with GDEI score. There was a proportional positive association of BC ratio with GDEI owing to the correlation coefficient value (r = 0.863). One of the major dimensions of GDEI is achievements of SHG which is an indirect representation of yield and economic gain from the micro-enterprise of the SHGs and therefore it could be a primary factor responsible for a positive relationship of yield or BC Ratio with GDEI.

3.2.2. Gender perspectives of bivalve farming Self Help Groups

The gender participation in different activities, gender needs, decision making and access and control over the resources in respect to bivalve culture were analyzed. Opinion of men and women in above aspect was found to be similar without any significant difference. However, differential gender response was observed between the villages in Kasargod and Kollam districts. Significantly, the accounting/money transaction is under the control of women and the most important requirement perceived by both men and women is the timely availability of spat. In case of participation and need, both men and women share almost the same opinion (Sahoo et al, 2009). Socio-economic, technological and export support requirement was analyzed for gender mainstreaming. Male and female respondents in a household were separately interviewed for getting the response of gender needs in terms of access to resources in mussel/oyster culture, participation in various activities of bivalve farming, gender needs and decision making in various stages. The typology access to resources in bivalve farming in gender response such as female alone, male **<** female, male **=** female**,** male **>** female and male alone indicated separately for male and female respondents (Table 6).

A perusal of the table 6 clearly shows the gender response in participation in various activities in mussel farming such as female alone, male **<** female, male **=** female**,** male **>** female and male alone indicated separately by male and female are presented in the table. A perusal of the table clearly indicates the participation profile in gender perspective in mussel farming for male and female separately and it can be glanced clearly that, the male dominating operations of bivalve farming were after care, arranging bamboo poles and ropes, seeding nets, canoeing to the sites, harvesting, hiring canoes to estuary, mussel spat collection, post harvest operation, raft construction, seeding rate and seeding, site selection, transport to shore and tying the seeded ropes to the raft which are labour

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Table 7
Relationship of Yield and GDEI of selected SHGs in Karwar

SHG	Yield in Kg / m	GDEI score	Correlation Coefficient (r)	't' value
SHG 1	9.2	53.71		
SHG 2	9.1	52.31		
SHG 3	8.9	51.91		
SHG 4	12.6	57.32		
SHG 5	12.7	56.68	0.958139	9.4656248**
SHG 6	12.5	57.14		
SHG 7	13.6	60.01		
SHG 8	13.1	59.98		
SHG 9	13.8	61.29		
SHG 10	13.2	60.02		

intensive as per the responses of both male and female. But the female dominating activities are record keeping, shell disposal, marketing of live mussel, shucked mussel, meat shucking etc.

3.3. Case study on Mussel farming Self Help Groups in Karwar of Karnataka

Self Help Groups (SHGs) of fisherfolk were mobilised by CMFRI in Karwar and Bhatkal locations of Karnataka coastal belts. Three SHGs of 15 members each comprising a total of 45 were mobilised in Majali (Open Sea) of Dhandebag and three SHGs of 15 members, each comprising a total of 45 were mobilised in Sunkeri of Kali estuary in Karwar coastal belts in Uttar Kannada district of Karnataka state. Training and demonstration on mussel farming was undertaken in these SHGs. Initially, two training and demonstration programmes in these two sites in Karwar were undertaken, one for raft culture in open sea in Majali of Dandebag and one for rack culture in Sunkeri of Kali estuary. The training was imparted to 45 members of three Self Help Groups, each possessing 15 members in 2 sites separately comprising a total of 90 participants. At Majali in open sea, a 5 x 5 metre raft and at Sunkeri of Kali esturay, a 5 x 5 metre rack were constructed for mussel farming (Photograph 4).

Similarly In Mundalli river of Bhatkal estuary in Karnataka, 4 Self Help Groups of 15 members each exclusively of women fisherfolk mobilised under the NGO, 'Snehakunja' comprising a total of 60 participants were trained on mussel farming. They initiated a trial in 5 x 6 metre rack mussel culture by long line method. Data were gathered from these 10 Self Help Groups through personal interviews of the respondents. For the study, the Group Dynamics of members of Self Help Groups was again measured the index GDEI. The growth parameters were monitored every week in all the sites and the yield particulars of mussel during harvesting in each SHG was also noted. The SHGs of Majali and Sunkeri were mobilized by the project team of CMFRI and the SHGs of Bhatkal were mobilized by a NGO namely Snehakunja. The first two trials and demonstrations were under the funding of CMFRI and for the last one, only the technical helps during the training and demonstration were offered by CMFRI. As mainstreaming gender was a major consideration in the trials, women participation was ensured in each stage of farming operations and SHGs exclusively of women also were mobilized for mussel farming. The yield particulars in all the ten SHGs were noted and found as substantially good which proves the profitability of mussel farming in the subsequent trials because the material costs such as those of bamboo, rope, cloth and labour cost in construction etc. are negligible, this ensures reasonable profit as a major consequence of adoption of mussel farming enterprise bringing about economic empowerment of rural women through organised Self Help Groups.

The open sea mussel culture in this particular case met with the impediment of unfortunate sabotage of the seeded mussel by some miscreants. It was rectified by reseeding, but the yield was not that much conspicuous compared to the trials undertaken in estuaries. The yield in Kg per metre length of the rope recorded in all SHGs as Average Yield showed a positive relationship with GDEI score. The correlation (r = 0.958139) was found significant owing to the 't' value 9.465624 at 1% level of significance (Table 7). The utilization of fund sources, accounts maintenance etc. are all systematically accomplished by the group members thereby ascertaining the fulfillment of norms and standards of the SHG leading to economic empowerment of the members. Here also, the positive correlation is observed between Yield and GDEI. As one of the major dimensions of GDEI is the achievements of SHG which is an indirect representation of yield and economic gain from the micro enterprise of the SHG, it is quite natural to observe a positive relationship of yield or BC ratio with GDEI (Vipinkumar and Asokan, 2008). The case study elucidated in Karwar coastal belts also revealed that mussel farming has achieved considerable significance because of its profitability. It is quite interesting to proclaim in the near future that mussel culture is being fully grown up to possess the potential to be known as an exclusive women based independent enterprise in west coasts. It would be vital to look up on the gender issues in the selection of suitable sites and various operations fulfilling the essential parameters for undertaking mussel culture trials. But it is inevitable to take care of the selection of suitable sites fulfilling the essential parameters for undertaking mussel culture trials. It would be pertinent to have study on the effect of coir retting zones on growth and attachment of mussel seeds to the strings, which often found to be not suitable by experiences and observations. Laboratory experiments should be widened to study the effect of coir retting zones on growth of mussel. Export potential of mussel can be promoted through value addition experiments on depuration plants in filtered seawater. Organised fishermen's cooperatives can play a vital in various stages of seeding, harvesting, sorting, grading, packing, marketing with an intention of export potential. As mussel seed availability is a major constraint, efforts should be initiated for widening the mussel seed production technologies developed by CMFRI on a larger scale.

3.4. Case study on Institution-Village-Linkage-Programme (IVLP) for Technology Assessment and Refinement (TAR) in the Coastal Agro Ecosystem of Ernakulam in Kerala

Another major attempt of empowerment of fisherfolk was through the NATP funded project on IVLP with the major targets of assessing the needs and identifying the coastal agro ecology and production system perspectives of technologies in the selected village and introducing improvements in the existing production systems through better scientific management practices to enhance productivity and thereby to improve the farm production systems for refining the technologies for productivity, equitability, stability, sustainability and profitability. The IVLP has been operational at Elamkunnapuzha Village of Vypeen Island in Ernakulam District of Kerala. A total of 687 farm families were involved in the project as participant stakeholders covering a population of 3435. Altogether, 31 techno-interventions were implemented (13 in fisheries, 13 in agri-horticulture, and 5in livestock) and 15 training programmes were organized for 576 farmers. The linkages developed in this programme enabled the stakeholders to sustain and continue their efforts. The impact of this programme has been highly appreciated and acclaimed and is now popularly known as "Elamkunnappuzha model of development" (Photograph 5).

During the final phase, emphasis was given for prioritisation of the refined technologies and the following six techno- interventions were selected for horizontal expansion in the state of Kerala such as Monoculture of grey mullet, Monoculture of milkfish, Polyculture of finfish, INM in coconut plantations, Dairy farming with paragrass, Poultry farming with the "Gramalakshmi" breed etc. The projected economic impact for these six technologies, at 25 % level of adoption in Kerala state alone was worked out as Rs.420 crore from an additional production of 60000 t of fish, Rs 220

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Photograph 4
SHG members with mussel seeded ropes in Kali estuary of Sunkeri of Karwar

Photograph 5
Finfish culture: harvest under IVLP

Photograph 6
Janani Self Help Group at *Elamkunnappuzha* engaged in Dry Fish Processing

crore from a surplus milk yield of 1000 t per day, an additional revenue of Rs 12 crore from poultry, and Rs 190 crore from coconut plantations in coastal districts. Many of the interventions initiated by IVLP were sustained by the ATIC of CMFRI as the sales outlet of ATIC provided the platform for selling the items of IVLP units. Success case studies were elucidated from such fisherfolk who brought out a remarkable professional achievement, improved earnings and employment. Similarly Self Help Groups mobilized by various micro enterprises with the inspiration and support from ATIC also were taken in to consideration for exploring the success cases. For collecting data for livelihood analysis, the sources were the available existing information, people's perceptions and opinions and observations in addition to personal interview. The livelihood analysis encompasses all the strategies and assets that individuals and households use to earn a living (Aujimangkul et al, 2000, DFID, 2001; Graham and Tanyang, 2001; CBCRM Resource Center 2003; Arciaga et al, 2002; Ashby, 2003).

Under IVLP, in Finfish culture a major success story of a fisher family is of Sri.Karthikeyan (48), Thirunilathu, Puthuvyppu, Elamkunnapuzha having primary level of education, was a regular visitor of CMFRI for the technology on 'polyculture of finfish (*Chanos chanos* and *Mugil cephalus*)'. He entered into the field of fish culture during 1996, in his own farm. He owns 42 cents of land. The location was very bushy obstructing the inflow and outflow of saline water from the sea. This resulted in silt deposition and increase in weed population. The bushy land was cleared and deepened for culturing fish. He constructed temporary sluices in the eastern corner of the pond. No additional labourers were employed; rather the work was done by the family members. His wife Mrs. Isha engaged herself fully in the farm operations. Natural entry of various species of gray mullets, pearl spot and milkfish was allowed. Apart from this, selective stocking of *Mugil cephalus* was also done at times. No specific stocking rate was maintained in such selective stocking. The economic returns were very minimal and were inadequate to make both ends meet. Irregular stocking and feeding pattern might be the reason for the low yield and less profit during those periods. He contacted CMFRI and made use of the technologies by becoming a member of IVLP programme during 2001. He says that, "I was given training regarding different aspects of finfish farming and I learned the importance of maintaining sluice gates for the proper water exchange. Stocking of fish and their feeding pattern were followed as per the suggestions of Scientists. My income earning from fish culture has increased from Rs. 32,000 /- to around Rs. 55,000 /-. I could manage to provide good education to my daughters. With no doubt in my mind I proudly say that all this is possible only because of IVLP and ATIC of CMFRI".

3.5. Case study on Dry Fish Processing: A success case of Women's Self Help Group at Elamkunnappuzha

'Janani' Self Help Group, Puthuvyppu Post, Elamkunnapuzha in Vypeen Island was conspicuous for the intervention of drying of fish through consultation of CMFRI. The group has 15 members and was engaged in the rack drying of fish. Drying of fish was not new to them since they were doing it on individual basis on a limited scale. They used to dry the fish in the traditional way. The President of Janani group, Mrs.Chandramathi Appukuttan says that, she settled at Elamkunnapuzha village after her marriage 20 years back. She became a part of 13-member women-group in 1997 (Photograph 6). They used to make use of the market surplus of bumper fish catch for drying purpose. The operational cost was less, but they could get very less profit as the unhygienic practices followed at that time caused high amount of wastage of fishes. Most of the dried fish were taken for own consumption. They are also engaged in door-to-door selling of the products. The dried fish was mostly marketed at the local market. She says that, "It is our luck that our group is selected by the ATIC of CMFRI for marketing of the dried fish items. With the advent of this programme and inputs of IVLP, we process first quality fish

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Photograph 7

Sylvi Figerado and Juliet, the dynamic couple engaged in crab fattening, duck farming & vegetable cultivation

on commercial basis. The products are marketed well in good packing conditions, replacing our earlier paper packing. The training given by the Scientists from CMFRI on dip treatment under IVLP has increased our awareness regarding the hygienic method of drying fishes using 'calcium powder'. They also gave information regarding new marketing outlets. The 'special racks' those were provided for the drying of fish helped us in maintaining the fish products in good condition and reduced the wastage of fish during processing. Now more and more people, especially women are coming forward to take up similar venture.

3.6. Case study on Crab culture & Crab fattening: A fisher family's Success Story at Malippuram

Sylvi Figerado (53) (Pathissery, Malippuram Po. Elamkunnapuzha) is a dynamic farmer who took up Crab Monoculture based on CMFRI technology. Figerado, a matriculate, took around 6 acres of pond on lease for shrimp farming. Initially he was interested in active fishing and he was an owner of two boats during 1980s. He could not sustain his fishing business for a long period as he met with heavy losses (Photograph 7). His two male children were too young to support him economically during his difficult period. He shifted over to crab culture with the consultation of IVLP team of CMFRI. The regular farm advisory services on crab culture and fattening were offered through the ATIC and his reluctance and negative attitude towards crab farming was totally vanished. His wife Juliet aged 53, supported him in all his farming operations. They were aware of the requirement of proper water exchange, farming, quality seeds for stocking, selection of uniform sized seeds, farm requirements and the feeding pattern. In 2002 they earned a profit of 47, 000 /- from their pond in a single harvest. In the next lot they earned a profit of more than 50, 000 /-. That trend continued till date. Now the couple is confident that, whenever they are in need of money, they just sell crabs and get adequate amount all on a sudden. They proclaim that, crab farming is the best technology for obtaining maximum profit without much risk. Now Sylvi and Juliet have diversified the crab culture along with duck farming and vegetable cultivation in homesteads with bitter gourd and cowpea. The excreta of ducks became good organic manure for his homestead plot in which integrated farming is being practiced.

4. DISCUSSION ON GENDER ISSUES AND CHALLENGES IN THE CONTEXT OF INDIAN MARINE FISHERIES SECTOR AND MARICULTURE

With regard to gender issues and challenges, one of the biggest constraints in mariculture sector of Indian scenario is the lack of a clear cut policy framework uniformly applicable throughout the coastal belts of the country (Mohamed and Kripa, 2010, Radhakrishanan and Dineshbabu, 2011). Policies need to be framed for leasing out water bodies to fisherwomen, for viable and profitable ventures. Bivalve farming especially mussel culture faces a number of impediments like water salinity, seed availability, selection of location / site, climatic vagaries, identification of proper beneficiaries and proper monitoring opportunities. The major problems and constraints faced by the women in mussel cultivation are meat shucking problems, marketing of mussels, unpredictable seed availability, mortality of seeds during transportation, reduced growth during certain years, social constraints like caste splits, conflicts etc. to a certain extent.

1. It is imperative that the government agencies should come forward with improved marketing facilities as marketing of the mussel was perceived as one of the biggest constraints. Provision of loans with reduced interest rates and freezer facility for storage of harvested mussels can bring about a breakthrough in this sector in the near future.
2. Severe occupational health hazards have been noticed in women engaged in fisheries because, long hours of monotonous work are causing specific health hazards to fisherwomen depending on the type of work. In a study at Anjilikkad area, it was observed that 33% of women engaged in clam fisheries are suffering with backache. As they are exposed to smoke, they are also suffering with headache (19%). Because of hard work 21% of women engaged were having myalgia (Sathiadhas and Femeena Hassan, 2005).
3. Over the last four decades, modernisation of fisheries has essentially reduced women's role in the fishing industry in many ways. The modernisation has led to the concentration of fish landings in the harbours, the displacement of women from fish vending and the trade was taken over by fishermen. Some women who have no option other than fish vending to sustain their families now face many hardships. The large seafood export processing industry has provided many opportunities for women's employment, but only women from certain pockets can make use of these avenues. Moreover this export -oriented production cum processing sector has effectively transformed women from an independent self-employed status to that of wage earners. Improved transportation and infrastructure have reduced the opportunities of women engaged in drying and curing activities.
4. Drudgery and wage disparity and were often observed as notable issues in major sectors of employment in fisheries and mariculture sector which requires a considerable revamping.
5. In aquaculture research and technology development, integrating gender perspective is an essential requisite because the gender mainstreaming approach advances gender equality and equity in the society. Though women's role in Indian fisheries sector is very significant, there is a gender bias in respect of their works and the inequalities between men and women in rural India are observed in the social, cultural and economic lives and are being maintained in the society though various forms of bias. The advantage of this integration is that, it allows for the advancement of gender equality and equity regardless of whether it is women or men who are disadvantaged or whose position needs to be addressed and thereby identifies the areas where progress is lagging and highlights the need for intervention in specific areas in policy making and planning in aquaculture research and technology development.
6. The case studies explored in the preset study, narrated the general constraints faced by the women fisherfolk

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which include poor living conditions & livelihood security, educational Illiteracy, lack of proper employment, socially unorganized set up, gender inequality, alcoholism of men fisherfolk & exploitation, health problems, cultural bonding, customs, traditions, conservatism etc are the. In the meantime, at the SHG level, the marketing aspect was the major issue and the difficulty in choosing an appropriate micro enterprise for sustenance often makes the SHG as an additional burden As marketing aspect was perceived to be the major constraint of the SHGs rather than procedural hurdles of preparing minutes, reports, meetings, banking etc. it is obvious that it is high time for diversification of micro enterprise in additional to fishery based ones in these SHGs' for sustainability.

7. Similarly, it is inevitable that, there is a genuine need for integrating gender perspective in development works or in aquaculture extension also because women are the important stakeholders of our development process and our Extension system hardly targets the women folk for technological empowerment. Though women participation in fisheries sector though is age old, they are often engaged in traditional methods of processing and marketing. Their participation in aquaculture sector is not yet properly defined in the Indian context or requires a lot of advancements. Aquaculture is a developing sector and women participation in this sector needs meticulous planning for technological empowerment encompassing the social and technical barriers. The planners' perception of women and their roles has led to the introduction of aquaculture as a male activity. Consequently, extension services have ignored women's work in aquaculture. Past experiences have shown that more intensive fish culture systems are not within the reach of many small-scale farmers, especially women. Access to resources differs for men and women, and some of the biggest constraints women face are time and labour. A different kind of technical package may allow greater adoption by women farmers than is possible now. To ensure this, gender mainstreaming approach through integrating gender perspective in development works and aquaculture extension is a paramount requisite.

5. CONCLUSION

The removal of gender imbalances should be established as a priority to ensure rapid economic development of the country. It is a truth that, no nation can ignore fifty per cent of its population and bring in social change and economic prosperity. This would mobilize the remaining fifty percent of the country's human resources and would result in the smooth movement of the economic wheel. National policies should be resolute in tackling this issue and local bodies should ensure the implementation of these policies at the community level (Shyam et al, 2011). There is immense need to create better opportunities for women in coastal fishing communities to enhance their social and economic role and enable them to participate in development efforts, rehabilitation and conservation of the coastal and aquatic environment. Location-specific and need based training programmes for fisherwomen should be organized to enhance the awareness and technical know-how enabling them to start self-generating gainful employment ventures in aquaculture and post-harvest sector of fisheries. The special features of fisheries and aquaculture make it necessary to link micro finance to appropriate technology development and transfer to women clients. Both capture fisheries and aquaculture requires upgraded vocational training programmes and technical advice crucial for the success of women's micro enterprises. CMFRI has developed a technology for the farming of mussels in the open sea and protected bays. The technology is simple and cost effective and has been widely adopted by the fisherfolk of Kerala and Karnataka (Pillai, 2000). Several women SHGs in the Kasaragod district of Northern Kerala have successfully tailored the venture and proved profitable. Similarly adoption and expansion of ornamental fish culture can earn surplus high income both in rural and urban centres. Women could significantly contribute to this sector if trained and oriented in the right direction. Opportunities for women in fisheries could be enlarged in the field of integrated aquaculture, agribusiness consortia fishery estates, marine products development management of fishery infrastructure marketing and export as well as in research and technology development. Freshwater pearl culture is fast picking up as commercial venture and there are moves to integrate it with the carp culture to generate additional revenue to the farmer. Women could take up pearl culture as a productive income-earning venture on account of the vast unutilized potential. Promotion of diversified value added products not only accelerate earnings in exports, but also provide a multiplier effect on employment front especially for weaker sections and women folk. Efforts taken by government and non-governmental agencies to organise fisherwomen into self-help groups and involving them in the preparation of value added products and marketing has brought out encouraging results.

Another strategy to cope with the local demand patterns of quality seeds of fish/shrimps is the development of backyard hatcheries which could be taken up by women. House-based ventures are more preferred by women and found suitable to their present social fabric. Aqua-feed making using the indigenous resources, as a cottage industry may be developed to suit the needs of the aquaculture industry. Appropriate training programmes, including the possible linkages of necessary credit facilities in liaison with scientific institutes and formal financial institutions respectively should be imparted to the primary stakeholders are needed. Quantifying ergonomics of the women involved in aquaculture and allied activities by generating data and documenting the gender literature are important. For determining the economic contribution of women fisherfolk in order to enhance visibility, there is a need for the sensitization of development organizations and staff towards fisherwomen's economic and financial needs. Similarly improving the socioeconomic condition of women fisherfolk in terms of the pertinent areas of maternal health and nutrition care are important. Mobilization of Self Help Groups, setting up of Mahila Rural Co-operative banks, Women cell and collaboration and networking with NGOs etc are to be worked out by using the strategy developed in the case studies as a practical manual. Promoting "men and women partnership firms" instead of exclusively women-oriented enterprises is another practical strategy. The case studies explored showed that husband-wife enterprises with one or two helpers in fish processing/marketing in fishery related activities yields better prospects. Another inference to be drawn from the selected cases on bivalve farming narrated in the present study is that it is achieving considerable significance because of its profitability and it is quite interesting to proclaim in the near future that mussel culture is being fully grown up to possess the potential to be known as an exclusive women based independent enterprise in west coasts. It would be vital to look up on the gender issues in the selection of suitable sites and various operations fulfilling the essential parameters for undertaking bivalve culture trials. Export potential of bivalves can be promoted through value addition experiments on depuration plants in filtered seawater. Organised fishermen's cooperatives can play a vital in various stages of seeding, harvesting, sorting, grading, packing, marketing with an intention of export potential. As mussel seed availability is a major constraint, efforts should be initiated for widening the mussel seed production technologies developed by CMFRI on a larger scale. As gender mainstreaming approach advances gender equality and equity in the society, integration of the gender perspective in mariculture research and technology development in marine fisheries sector also is an essential requisite.

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SUMMARY OF RESEARCH

1. A brief descriptive diagnostic study was undertaken on gender mainstreaming in Indian marine fisheries sector emphasizing on the gender equity and equality stressed in the Indian context by elucidating success cases in marine fisheries. Policy and programs for aquaculture development in India also have been explored with special reference to mariculture sector based on primary and secondary data gathering methods. Practical cases on mariculture technologies disseminated by Central Marine Fisheries Research Institute with involvement of women were narrated which can be used as case model and practical manual for mobilizing SHGs in any key areas.
2. The paper also highlights the glimpses of gender issues and challenges in mariculture and marine fisheries sector in India and the future direction to proceed further. For ensuring a rapid economic development, removal of gender imbalances should be established as a priority and this would mobilize the remaining fifty percent of the country's human resources and would result in the smooth movement of the economic wheel. Integrating gender perspective in mariculture research and technology development is inevitable because the gender mainstreaming approach advances gender equality and equity in the society. The case studies explored the extent of empowerment brought out in different dimensions including social, political, spiritual and economic strength through Self Help Group mobilization and the suitability of appropriate micro enterprises for the betterment of livelihood parameters in the marine fisheries sector of the country.

FUTURE ISSUES

A tip of the iceberg of poverty eradication in marine fisheries sector is attempted in this study on dynamics of women's SHGs. The scale of Group Dynamics with 12 dimensions can be used for similar future research in fisheries and allied sectors for different types of community based groups such as youth, labourers, extension personnel etc. The lacunae identified in GDEI give feedback for the possible improvement in SHG functioning by taking care of the dimensions contributing their effectiveness. The success case studies elucidated can be adopted as a case model for mobilizing SHGs in other key areas like Agriculture, Forestry, Floriculture, Agro based industries, Watershed development etc. The strategy developed for mobilizing SHG can be used as a practical manual for organizing and managing SHGs' on any area on a sustainable basis. The future researchers can think about bringing social action for sensitization on crucial issues like women fisherfolk's rights and marketing channels including policies and other interventions to ensure equality through gender mainstreaming in mariculture and marine fisheries sector. To get a distinct outlook of the scenario of gender mainstreaming and Self Help Group Dynamics of women, and exhaustive research with larger sample and wider area involving the farmers of other crop enterprises like cash crops, perennials and homestead farming systems would be of ample scope. Similarly it is quite necessary for integrating gender perspective in aquaculture/ mariculture extension also because women are the important stakeholders of our aquaculture development process and our extension system hardly targets the women folk for technological empowerment. The identified constraints of SHGs and the preference ranking of micro enterprises give an idea on the appropriateness of the location specific venture in fisheries and diversified sectors for economic empowerment of SHGs' of women fisherfolk. The identified interrelationships between the variables can act as catalytic points for promoting group empowerment, which might give useful insight on the plausibility of using the group dynamics network for strengthening the functioning of women's SHGs'. Ultimately, poverty can only be eradicated by mobilizing women to solve their actual problems through Self Help Groups.

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