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Dynamics of Self Help Groups in Indian Marine Fisheries Sector

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The concept of 'Self Help Group' (SHG) exists prior to any intervention. The SHG consists of members linked by a common bond like caste, sub-caste, community, place of origin, activity etc. in these `natural groups' or 'affinity groups'. The `Self Help Groups' provide 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 (Fernandez, 1995). 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. 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. Rational utilization of common property resources for sustainable development without endangering the environment is possible through community participation.

Meaning of a micro enterprise

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) 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 Microfinance Institutions 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 etc. 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 Self Help Groups.

Based on the resource availability and circumstances the micro enterprises those the SHGs' can generally bring to practical utility in allied sectors 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, *Pappads*, 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. The suitability of the enterprise varies from situation to situation. The essential features for the success of a viable micro enterprise are :

1. The availability of sufficient quantity of raw materials locally.
2. The identified enterprise is known or easy to learn and practice.
3. The cost of production must be low.
4. The products must be of very good quality.
5. The availability of market for the products.

The present study focuses on the relevance of mariculture successfully attempted by SHGs. Mariculture offers good scope for development in our open waters for enhancing food and livelihood security of the stakeholders in our coastal agro climatic zones. The micro enterprises suitable in fisheries sector for SHGs in this sector are Mussel culture, Edible oyster culture, Pearl culture, Seaweed culture, Cage culture etc. Mussel farming 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. (Asokan *et al*, 2001,

Vipinkumar *et al*, 2001, Vipinkumar and Asokan, 2008). Here an attempt has been made on exploration of three case studies in Kasargod and Kollam districts of Kerala and Karwar of Karnataka on dynamics of Self Help Groups of fisherfolk engaged in Mussel Farming. Experiences and observations indicate that, for a group to be developed as a Self Help Group, normally a period of 36 months (3 years) will be required. Within this gestation period when the group passes through three distinct phases, up to 4 months as the Formation Phase, up to 15 months as Stabilisation Phase, and up to 36 months as the Self Helping Phase, the group gets led to the stage of a flourishing Self Help Group as per the indications given by social research results on Self Help Groups. The three distinct phases and the critical features are described as follows:

Group Initiation/Formation Phase (0 to 4 Months)

- The major steps in this phase should include the initial visit to the location, rapport building, awareness creation, identification of women fisherfolk, conduct of meetings, documentation of deliberations, action plans for arranging raw materials for the fishery based and diversified micro enterprises and the selection of 'leader of fisherwomen'

Building up / Stabilization Phase (4 to 15 Months)

- This phase must involve regular fortnightly meetings, maintenance of documents, scheduled implementation of action plan, procurement of inputs based on procurement plan as per production plan prepared based on market demand, market synchronized production planning, intensive training to carry out activities of production, credit and marketing aspects and changing the leaders of SHG after one year so that periodic rotation gives the other potential leaders a chance to lead.

Self Helping Phase (15 to 36 Months)

- The main steps to be included in this phase are the development of a fortnightly action programme, meetings for sharing experiences, refinement, and improvement and problem solving for the activities under the responsibilities of the leaders, The extension personnel's role will be limited to that of a facilitator, gradually reducing their presence at meetings. Active leaders will give way to new leaders after a two year term; inter-SHG contacts and healthy competition will be encouraged, favorable group atmosphere, empathy and interpersonal trust for significant achievements of SHG will be encouraged.

The fisheries Self Help Groups have to focus attention on joint efforts co-operatively for finding out suitable micro enterprises, which can assure a constant income for the fisherfolk, based on locally available resources for poverty eradication. 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. A couple of case studies on dynamics of Self Help Groups engaged in mussel culture are explored here.

1. Case study on Mussel Farming Self Help Groups of Women in Kasargod district:

The extreme north district of Kerala named as Kasargod, is particularly notable for mussel farming as it has been successfully accomplished by the women's Self Help Groups (SHGs) for the past few years. These groups were given financial assistance in the scheme namely; SGSY (Swarnajayanthi Gramaswa Rosgar Yojana) by the state government which takes care of economic empowerment of weaker sections (Vipinkumar *et al* 2001). Subsidies, bank loans etc are the part and parcel of it and it essentially focuses attention on poverty alleviation through organised Self Help Groups. This programme looks into training, credit, marketing, technical knowledge and basic facilities necessary for the upliftment of the poor to bring them above the poverty line within three years in such a way that they should have a monthly earnings of at least Rs 2000/-.It would be pertinent to have a look into the consequences of adoption and cost dynamics of mussel farming by the women's Self Help Groups in Kasargod district.

This district possesses an area of 1992 km^2 with a population of 10, 71508. The district with a population density of 538 km^2 has an average growth rate of 22.78 and 82.51 % literacy rate. Majority of the villagers earns their livelihood by agriculture, fishing, coir retting, coconut husk, toddy tapping etc. There is tremendous potential for aquaculture diversification in Kasargod coastal belts. Water bodies in these coastal belts have amble scope for the judicious utilisation of finfish culture, prawn and crab farming in Kasargod. (Asokan *et al* 2001). This study was undertaken in two major panchayaths namely Cheruvathur and Padanna in Kasargod district. The study area, Cheruvathur panchayath has an area of 18.37 km^2 with a population of 24, 504 out of which 18, 631 people are literate. Agriculture is the main occupation of the majority and about 150 families are engaged in fishing as the main occupation and about 300 families as subsidiary occupation.

Similarly, Padanna panchayath has an area of 13.08 km^2 with a population of 17, 961 out of which 12, 746 people are literate. About 200 families are engaged in fishing as main occupation and about 400 families as part time occupation. The brackish water estuary systems of these panchayaths are extremely suitable for mussel culture. Six Self Help Groups of women (three each from both panchayaths) were selected as the sample and the data were gathered as explorative case studies through personal interviews of the respondents. For the study, the Group Dynamics of members of Self Help Groups was measured by developing an index called Group Dynamics Effectiveness Index (GDEI). Group Dynamics Effectiveness was operationally defined for the study 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) For the computation of the Group Dynamics Effectiveness Index (GDEI), the scores obtained for each of the above mentioned sub-dimensions were first made uniform and then multiplied by the corresponding

weightage assigned to each as by expert judges. These scores were then added up to get the GDEI score of each respondent. It was also ensured that all the sub-dimensions identified as components of GDE were of high significance on the basis of the coefficient of agreement in judges rating as well as the statistical evidence from the results of the pilot study. The measurement device developed for the dependent variable *i.e.*, GDE was ascertained for its content validity.

Measurement of sub-dimensions

A. Participation: For the present study, participation was operationally defined as the degree to which the farmer is involved in group meetings, discussions and group activities of SHG.

B. Influence & style of influence: Influence was operationally defined as the degree to which a farmer can influence other member of SHG in a desirable way. Style of influence was operationalised as the manner in which the member attempts to influence other members of SHG. The four different styles included were autocratic style, peacemaker style, laissez-faire style and democratic style.

C. Decision making procedures: This is operationally defined as the degree to which farmer makes a decision with involvement of other group member of SHG, makes decisions without topic drifting, supports other members' decisions in consensus, feels the majority's decisions valid in the SHG, attempts to get all members participate in decisions of SHG and feels the gains of recognition for his contribution in decision making process.

D. Task functions: This is operationalised as the degree to which the farmer makes suggestions to tackle a problem in the SHG, summarises what has been covered in the group, tries to give or ask for facts, ideas, opinions, feelings, feed back etc. and keeps the group on target.

E. Maintenance functions: This is operationalised as the extent to which farmer helps others into group activities of SHG, helps/interrupts him in group discussions, feels the other members are co-operative and listening, perceives other members help in clarifying the ideas of all members, feels good or bad when ideas are accepted or rejected and the extent to which other members attempt to maintain task functions of SHG.

F. Group Atmosphere: This is operationalised as the extent to which the group member prefers friendly congenial atmosphere in the SHG, attempts to suppress conflict or unpleasant feelings in the group, feels other members are involved and interested and feels satisfied from the work climate.

G. Membership: This is operationally defined as the degree to which a group member feels accepted or included in the SHG, feels sub-grouping in the SHG and feels himself or other members to be outside the group.

H. Feelings: This is operationally defined as the degree to which the farmer feels anger/irritation, frustration, warmth, affection, excitement/boredom and competitiveness while performing the group activities of SHG.

I. Norms: This is operationalised as the extent to which the farmer feels the standards or ground rules and regulations are in operation that controls the behaviour of group members for the smooth functioning of the SHG.

J. Empathy: This is operationally defined as the degree to which the respondent is able to make out other person's feelings and thereby to understand it as he feels.

K. Interpersonal trust: This is operationally defined as the degree to which the respondent trusts the other members of the group as well as the faith other members have in him as perceived by the respondent.

L. Achievements of SHG: This is operationalised as the level of performance of SHG as perceived by the farmer as well as the performance of the farmer himself as the group member.

All these sub-dimensions were measured by a set of inventories containing appropriate questions arranged in a three-point continuum of always, sometimes and never with scoring pattern 2,1 and 0 for positive and vice versa for negative questions.

The cost estimates of all the selected Self help Groups were also computed and by taking in to consideration of major expenditure required for mussel farming is for the materials such as bamboo, nylon rope, coir, cloth, seed, etc. and labour costs essentially cover construction, seeding, harvesting etc. the Net Operating Profit and B:C ratio also were calculated for different SHGs to draw valid inferences. The basic data with regard to fisheries sector of Kasargod district is presented in Table 1. The study, focused attention on Group Dynamics Effectiveness as a trait of Self Help Groups 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.

Table 1 : General profile of fisheries sector in Kasargod district

Sl.No	Parameter	Kasargod
1	Length of the Coast line	70 km
2	No. of Marine Fishing villages	16
3	No. of Inland Fishing villages	2
4	Marine Fisher folk population 2004-2005	45989
5	Active marine fishermen	10566
6	Inland Fisher folk population 2004-2005	1004
7	Active inland fishermen	435
8	No. of Fisheries co-operatives	27
9	No. of domestic fish markets	164
10	Annual Marine Fish Production 2004-2005	8292 tonnes
11	Annual Inland Fish Production 2004-2005	1612 tonnes

Profile of Cost Estimates of Mussel Farming

The major expenditure required for mussel 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 scheme DWCRA started mussel farming as early as 1996-97 and are assisted by loan amount worth Rs 8800 / -per member with a subsidy amount worth Rs 4400/- which looks quiet fascinating. 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 can 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 shown in the Table 2. The Net Operating Profit in all the six SHGs was computed and found as substantially good which proves the profitability of Mussel farming in the initial trial itself and since during the subsequent years, 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.

Table 2 : Cost estimates of the SHG's in mussel farming in Kasargod district.

	SHG1	**SHG 2**	**SHG 3**	**SHG 4**	**SHG 5**	**SHG 6**
No.of ropes	**500**	**800**	**600**	**750**	**900**	**725**
Items						
Bamboo	6400	9600	7980	9000	11437	7800
Nylon rope	9954	17500	12000	15000	18000	14500
Coir rope	1100	1500	1200	1587	2000	1450
Cloth	3000	3250	1700	3338	3600	2250
Seed	6500	10000	8700	9000	10800	9770
Labour						
Construction	1600	2400	2170	2250	2700	2200
Seeding	1500	2565	1500	1875	2500	1800
Harvesting	1300	2000	1500	2000	2750	1875
Miscellaneous	1000	1600	1200	1500	1800	1450
Total Cost	**32,354**	**50,415**	**37,950**	**45,550**	**55,587**	**43,095**
Returns	**40,000**	**64,000**	**48,000**	**60,000**	**72,000**	**58,000**

Net Operating Profit	**7,646**	**13,585**	**10,050**	**14,450**	**16,413**	**14,905**
B : C Ratio	**1.236**	**1.269**	**1.265**	**1.317**	**1.295**	**1.346**
GDE Index	**52.78**	**54.33**	**53.91**	**57.32**	**55.68**	**59.14**

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 Self Help Groups 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 perfectly 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.

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

Self Help Groups (SHGs) of fisherfolk were mobilised in *Karwar* and *Bhatkal* locations of Karnataka coastal belts. Three SHG's 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.

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. The sample design for observation including the number of SHGs' trained, beneficiaries and method of culture is given in Table 3.

Table 3: Mussel culture interventions in Karwar of Karnataka state

Site	**No.Of SHGs Trained**	**No.of beneficiaries**	**Method of culture**	**Size of the rack / raft**
Sunkeri of Kali estuary	3	45	Rack culture	5 x 5 m

Majali of Dhandebag	3	45	Raft culture	5 x 5 m
Bhatkal of Mundalli estuary	4	60	Raft culture	5 x 6 m

Essentially the 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 by developing an index called Group Dynamics Effectiveness 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 major expenditure required for mussel farming is for the materials such as bamboo, nylon rope, coir, cloth, seed, etc. and labour costs essentially for construction, seeding, harvesting etc. 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. 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 (Vipinkumar.V.P, 2005). The correlation (r = 0.958139) was found significant owing to the 't' value 9.465624 at 1% level of significance. (Table 4) Experiences already indicated that for a group to be developed as an SHG, a period of at least 3years will be required. It has to pass through three distinct phases such as Formation phase, Stabilisation phase and Self Helping phase. These Self Help Groups promote a cooperative and participative culture among the members, which ensures the empowerment culture of the Self Helping phase. The utilization of fund sources, accounts maintenance 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 4 : 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	0.958139	**9.4656248**

SHG 4	12.6	57.32		
SHG 5	12.7	56.68		
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		

3. Case study on assessment of mussel farming technologies in gender perspective in Kollam district of Kerala

An attempt was made on assessing the mariculture technologies in gender perspective in mussel farming in Kollam area of Southern Kerala as a subsidiary income-deriving source of rural fisherfolk. The experimental trials conducted by CMFRI have proved the techno-economic feasibility of brown mussel farming in Kollam area. Kollam district of Southern Kerala is conspicuous for the brown mussel farming through the women's Self Help Groups organized through *Kudumbasree ayalkoottams*. It would be pertinent to have a look into the consequences of adoption and cost dynamics of mussel farming by the women's Self Help Groups in Kollam.

Geographical aspects of Kollam district

Quilon or Kollam, is an old seaport town on the Arabian coast. About thirty per cent of this district is covered by the Ashtamudi lake, thereby making it the gateway to the backwaters of the state. Kollam District which is a veritable Kerala in miniature is gifted with unique representative features - sea, lakes, plains, mountains, rivers, streams, backwaters, forest, vast green fields and tropical crop of every variety both food crop and cash crop. Area : 2,491 km^2 with a population : 25,84,118 and the Literacy level of 91.49 %. The district has a prominent place in the field of agriculture. The total extent of land under cultivation is **2,18,267** hectares. The principal crops are **paddy, tapioca, coconut, rubber, pepper, banana, mango and cashew.** About 70 per cent of the work force is engaged in agriculture. Coconut gardens extend to about 75,454 hectares. The five major crops: paddy, tapioca, coconut, rubber, pepper - are cultivated in an area of 1,73,847 hectares. Small and marginal farmers constitute more than 95% of the farming community and the average per family holding is 0.21 hectare. The basic data with regard to the fisheries sector of Kollam are presented in Table 5.

Table 5 : General profile of fisheries sector in Kollam district

Sl.No	Parameter	Kollam
1	Length of the Coast line	37 km
2	No. of Marine Fishing villages	27
3	No. of Inland Fishing villages	26
4	Marine Fisherfolk population 2004-2005	96703
5	Active marine fishermen	21368
6	Inland Fisherfolk population 2004-2005	36653
7	Active inland fishermen	6255
8	No. of Fisheries co-operatives	99
9	No. of domestic fish markets	324
10	Annual Marine Fish Production 2004-2005	143138 tonnes
11	Annual Inland Fish Production 2004-2005	10778 tonnes

Kollam is an important maritime district of the state with a coast line of 37.3 kms. Fishing has a prominent place in the economy of the district. Neendakara and Sakthikulangara villages thrive in fishing. An estimated number of 22,000 persons are engaged in fishing and allied activities. Cheriazheekkal, Alappad, Pandarathuruthu, Puthenthura, Neendakara, Thangasseri, Eravipuram, Paravoor and Thekkumbhagam are nine among the 26 important fishing villages. There are 24 inland fishing villages also. Considering the unique location and infrastructure available, the Government has initiated steps for establishing a fishing harbour at Neendakara which is expected to augment fish production by 15%. Average fish landing is estimated to be 85,275 tonnes per year. One third of the state's fish catch is from Kollam. There are 93 producer co-operatives, two credit cooperatives and one marketing cooperative in the fisheries sector. There are 38 Fishermen Development Welfare Cooperative Societies in the district. Nearly 3000 mechanised boats are operating from the fishing harbour. FFDA and VFFDA are promoting fresh water fish culture and prawn farming respectively.

The present study was undertaken in Kaunagappally thaluk http://kollam.nic.in/karumap.htmlsituated 27 Kms north to Kollam. It is linked with Kollam by rail and road. Thekkumbhagam and Needakara panchayats were selected from this thaluk. Of these, Dhalavapuram and Malibagam villages of Thekkumbhagam panchayat and Pannakkal thuruthu and Puthan thuruthu villages of Neendakara panchayaths were selected for data collection. Data were collected from 200 mussel farming households mobilized in Self Help Groups in these villages to represent the Southern part of Kerala

through the trained enumerators. The man and woman of each family were separately interviewed to get the response to assess the gender need and gender role with the help of a pre tested well structured interview schedule to get the response to assess the gender need and gender role. In addition to this, 4 Self Help Groups of women from each panchayath were selected to draw explorative case studies through personal interviews of the respondents. In addition to this 4 Self Help Groups of women from each panchayath were selected to draw explorative case studies through personal interviews of the respondents (Table 6). The Benefit -Cost ratio was analysed in each group and cost dynamics were worked out. The problems and constraints faced by the women were also assessed in each case and listed out.

Table 6. Details of the basic information gathered & SHGs identified in Kollam district.

Name of the panchayat	Village	Samples selected (Self Help Groups)	No. of members
1. Thekkumbhagam	Dhalavapuram	Mahatmaji Kudumbasree Group	19 members
	Malibhagam	St.Maries Kudumbasree Group	16 members
2. Neendakara	Puthan thuruthu	Ashtajalarani Group	18 members
	Pannakkal thuruthu	Chavara south Group	15 members

Gender Role and Gender Need in Mussel Farming

In Kollam district, the gender participation in different activities, gender needs, decision making and access and control over the resources in respect to mussel 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. 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.

Profile of Yield aspects & Groups Dynamics of Mussel Farming in Kollam

The major expenditure required for mussel farming is for the materials such as bamboo, nylon rope, coir, cloth, seed; etc. and labour costs essentially cover construction,

seeding, harvesting etc. The relationship of yield and GDEI of selected SHGs is presented in Table 7. 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 coefficient value was (r = 0.92025)

Table 7. Relationship of Yield and GDEI of selected SHGs in Kollam district.

SHG	Yield in Kg / m	GDEI score	Correlation Coefficient (r)
SHG 1	14.6	60.08	0.92025
SHG 2	12.1	57.78	
SHG 3	13.9	59.16	
SHG 4	15.1	62.17	

Observations in case studies undertaken in Kollam on brown mussel farming Self Help Groups of women also indicated that for a group to be developed as a fully potential SHG, it requires a period of at least 36 months. After 3rd year, most of the groups in the study areas are in the Self Helping phase. Most of these groups promote a cooperative, participative and empowerment culture among the members. The loan sanctioning, utilisation, accounts maintenance and timely repayment of loans etc. are also accomplished judiciously and systematically with proper maintenance of the records by the group members. This ascertains the economic empowerment of the members through organised Self Help Groups.

Problems and constraints of gender in mussel farming

Mussel farming 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 in the rank order are Unpredictable seed availability, Meat shucking problem, Marketing of mussel, Mortality of seeds during transportation, Reduced growth during certain years, Social constraints like caste splits, conflicts etc. to a limited extent. Here also, all the group members are of unanimous opinion 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.

The consequence of adoption of mussel farming when accomplished through organised Co-operative Groups of women in North Malabar areas and South Quilon areas of Kerala state is achieving considerable significance because of its tremendous 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 Kerala. 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.

An assessment of gender role and gender need is inevitable in this context. It would be pertinent to have a study on the drudgery in mussel farming trials as well as effect of coir retting zones on growth and attachment of mussel seeds to the strings, which often found by experiences and observations. Laboratory experiments should be broadened to study the effect of coir retting zones on growth of mussel. Similarly, 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 role in various stages of seeding, harvesting, sorting, grading, packing and marketing with an intention of export potential. Irrespective of the location specific problem oriented resource based alternative programmes for income generation, this study emphasises on the gender need and gender role also ultimately for economic empowerment through mussel farming as a means of poverty eradication through Self Help Groups.

Open sea cage farming

Open sea cage farming is a promising venture which offers the fishers a chance for cultivating marine fishes and for optimally utilizing the existing water resources. As and R& D activity, CMFRI launched the first open sea cage 15 m diameter made High Density Poly Ethylene (HDPE) in the bay of Bengal off Visakhapatnam coast during May 2007. The second and third versions of marine cage were all found sea worthy at any extreme sea conditions. For easy management and cost effectiveness in terms of reduced labour, the size of the HDPE cages has been modified to 6 m in the 4th version. In a series of demonstration trials, these cages have been found to be successful in many maritime states along the Indian coasts. Latest version of pen sea cage is a cost effective GI cage designed for low investment farming operations found to be suitable in west coasts. Cage culture is a low impact farming practice with high economic returns. The system is eco-friendly without any human intervention, and a higher survival of above 75% was achieved and sustained. The candidate fish species grown in cages are sea bass, red snapper, chanos, mullets, cobia, pompano, groupers, koth, pomfrets, lobsters etc. The mariculture in open sea cage devised under the present invention will expand a new mariculture space, thereby the mariculture scale can be expanded greatly; simultaneously the self-pollution of mariculture can be solved. Now a low cost cage made of GI pipes were are also being used in silent bays of east coasts. Self Help Groups initiated by CMFRI undertook cage farming for edible oyster in Moothakunnam areas.

Seaweed Culture

Around 60 species of commercially important seaweeds with a standing crop of1,00,000 tons occur along the Indian coast from which, nearly 880 tonnes dryagarophytes and 3,600 tons dry alginophytes are exploited annually from the wild. Seaweed products like agar, algin, carragenan and liquid fertilizer are in demand in global markets and some economically viable seaweed cultivation technologies have been developed in India by CMFRI and Central Salt and Marine Chemical Research Institute (CSMCRI). CMFRI has developed technology to culture seaweeds by either vegetative propagation using fragments of seaweeds collected from natural beds or spores (tetraspores/ carpospores). It has the potential to develop in large productive coastal belts and also in onshore culture tanks, ponds and raceways. Recently the culture of the carageenan yielding sea weed

Kappaphycus alvarezii has become very popular and is being cultivated extensively along the Mandapam coast. To make the seaweed industry more economically viable, research aimed at improvement of strains of commercially important species by isolating viable protoplasts and somatic hybridization techniques is being carried out. The rate of production of *Gelidiellaa cerosa* from culture amounts to 5 tonnes dry weight per hectare, while *Gracilaria edulis* and *Hypnea* production is about 15 tonnes dry weight per hectare. Pilot scale field cultivation of *Kappaphycus alvarezii* carried out in the near shore area of Palk Bay and Gulf of Mannar showed maximum increase in yield of 4.3 fold after 30-32 days in Palk Bay and 5.7 fold after 22-34 days in Gulf of Mannar. This is a promising venture being undertaken by the women's Self Help Groups in Mandapam. So far as much as 1200 families were engaged in seaweed farming of which 60% of the farmers are women.

Conclusion

An attempt has been made to assess the socio economic impact of mussel farming by mobilizing Self Help Groups in Kasargod and Kollam areas of Kerala and Karwar area of Karnataka coastal belts. Mussel farming is achieving considerable significance because of its profitability. 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. The consequence of adoption of mussel farming when accomplished through organised Self Help Groups of women in North Malabar areas and South Quilon areas of Kerala state is achieving considerable significance because of its tremendous profitability. 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 and 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. The study emphatically disclosed the deep rooted influence of Group Dynamics network among the farmer folk as influenced by their participation, influence & styles of influence, decision making procedures, task function, maintenance function, group atmosphere, membership, feelings, norms, empathy, interpersonal trust and achievements of SHG. Irrespective of the location specific problem oriented resource based alternative programmes for income generation, this study emphasises on the economic empowerment of rural women through mussel farming as a means of poverty eradication through Self Help Groups because, poverty can only be alleviated by mobilising the poor to solve their actual problems in the form of organised SHGs'. In the impact assessment, the correlation analysis revealed, a proportional relationship between the Group Dynamics Effectiveness and Average Yield obtained for each SHG, which ensures reasonable profit as a major consequence of adoption of Mussel farming enterprise bringing about economic empowerment of fisherfolk through organised Self Help Groups.

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