Redefining Lives: Inspiring Case Studies of Self-Help Groups and Gender Empowerment

Vipinkumar V.P., Reshma Gills, Swathilekshmi P.S., Sanal Ebeneezar and Jenni B.
FRAEE & MBFNH Divisions,
ICAR – CMFRI

Development signifies the upliftment of the most marginalized sections of society, enhancing their standard of living. In the context of India's fisheries sector, true development and empowerment of weaker sections can be significantly realized through poverty alleviation initiatives driven by transparent mechanisms like Self-Help Groups (SHGs). These groups hold immense potential to play a pivotal role in advancing the fisheries sector. A critical aspect of this transformation is ensuring the active participation of fisherfolk, particularly women, in the planning and execution of various coastal development programs. Their involvement is key to creating sustainable and inclusive growth within the sector.

The open-access nature of marine fishery resource harvesting in India necessitates a dual focus on technological innovation and management strategies that balance livelihood needs with resource conservation. As India’s premier Marine Fisheries Research Institute, the Central Marine Fisheries Research Institute (CMFRI), with over six decades of dedicated service, has been at the forefront of proposing sustainable strategies for harnessing the potential of capture and culture fisheries while ensuring their optimal utilization.

Technological advancements thrive best in collaborative ecosystems. The success or failure of any innovation hinges on the strength of the partnership between researchers and the end-user

community. Rational utilization of common property resources for sustainable development, without jeopardizing environmental health, becomes achievable through active community participation.

One promising avenue is bivalve farming, particularly mussel and oyster cultivation, which holds significant potential for boosting food and livelihood security in coastal agro-climatic regions. Mussel farming, in particular, has emerged as a profitable supplementary income source for coastal fisherfolk, as demonstrated by CMFRI's experimental trials, which confirmed its techno-economic viability (Vipinkumar V.P. et al., 2001; Vipinkumar V.P. and Asokan, P.K., 2008).

This narrative delves into three case studies from Kasargod and Kollam districts of Kerala, and Karwar in Karnataka, highlighting the dynamics of Self-Help Groups (SHGs) of fisherfolk engaged in mussel farming. These case studies provide valuable insights into how SHGs, combined with innovative aquaculture practices, can serve as catalysts for sustainable development in coastal regions.

A Self-Help Group (SHG) is composed of individuals united by a common bond, such as caste, sub-caste, community, place of origin, or a shared activity. The concept of Group Dynamics within these SHGs refers to the interactions and forces at play between members, shaping the group's internal structure and processes. It explores how these groups are formed, their organizational structure, how they function, and how they impact individual members and the overall group (Lewin et al., 1960).

In their in-depth study of Group Dynamics, Pfeiffer and Jones (1972) identified key factors that influence a group's success, including how the group is organized, the leadership style, the training received by members and leaders, the tasks assigned to the group, and the group's history of success or failure. Further, in a comprehensive study, Hersey and Blanchard (1995) emphasized

the roles individuals play within groups—both helpful and hindering. These roles include establishing, persuading, manipulating, committing, being dependent, attending, and avoiding.

This section presents a couple of case studies that explore the dynamics of Self-Help Groups engaged in bivalve farming, shedding light on how these forces come together to influence the success and sustainability of such initiatives.

1. Case Study: Empowering Women through Mussel Farming in Kasargod District

Kasargod, located in the northernmost region of Kerala, has emerged as a notable hub for mussel farming, a success story largely driven by women's Self-Help Groups (SHGs). These groups have been thriving in mussel farming for several years, thanks to financial assistance provided under the Swarnajayanthi Gramaswa Rosgar Yojana (SGSY), a state government initiative focused on the economic empowerment of marginalized communities (Vipinkumar et al., 2001). This scheme offers subsidies, bank loans, and other financial support, emphasizing poverty alleviation through organized SHGs. The program targets comprehensive empowerment, offering training, credit, marketing, technical expertise, and essential facilities to uplift the poor. Its ultimate goal is to help participants earn a minimum of Rs 2,000 per month and rise above the poverty line within three years.

Kasargod, with an area of 1,992 km² and a population of 1,071,508, has a population density of 538 per km² and an impressive literacy rate of 82.51%. The district's economy is largely driven by agriculture, fishing, coir retting, toddy tapping, and other local industries. The coastal belts of Kasargod have significant potential for aquaculture diversification, offering opportunities for finfish culture, prawn, and crab farming (Asokan et al., 2001). Mussel

farming, in particular, has proven to be a profitable and sustainable livelihood for many coastal women.

This case study delves into the impact of mussel farming on the economic empowerment of women in Kasargod, examining the adoption dynamics, cost-effectiveness, and broader implications for poverty alleviation in the region. Through the efforts of SHGs, these women have not only contributed to the local economy but have also demonstrated how organized collective action can lead to meaningful change.

Methodology

This study was conducted in two prominent panchayats—Cheruvathur and Padanna—within the Kasargod district, both of which are ideal for mussel farming due to their brackish water estuary systems. Cheruvathur panchayat spans 18.37 km² and has a population of 24,504, with 18,631 individuals being literate. The majority of the population depends on agriculture, while approximately 150 families rely on fishing as their primary occupation, with an additional 300 families engaged in fishing as a subsidiary livelihood. Similarly, Padanna panchayat covers 13.08 km², with a population of 17,961 and 12,746 literate individuals. Around 200 families in Padanna depend on fishing as their primary occupation, while 400 families participate in fishing on a part-time basis.

In both panchayats, six women's Self-Help Groups (SHGs)—three from each—were mobilized under the DWCRA scheme, with ongoing support and technological assistance from the Central Marine Fisheries Research Institute (CMFRI). These groups were selected as the sample for the study, and data was collected through exploratory case studies involving personal interviews with the respondents.

To assess the Group Dynamics within these SHGs, the study introduced the Group Dynamics Effectiveness Index (GDEI). This index was designed to measure the overall effectiveness of group dynamics based on key sub-dimensions, such as participation, influence and styles of influence, decision-making procedures, task functions, maintenance functions, group atmosphere, membership, feelings, norms, empathy, interpersonal trust, and the achievements of the SHGs (Vipinkumar and Baldeo Singh, 1998). This approach provided valuable insights into how the internal dynamics of the SHGs influenced their success in mussel farming and the broader impact on the community.

To calculate the Group Dynamics Effectiveness Index (GDEI), the scores for each of the sub-dimensions were first standardized, then multiplied by the corresponding weightage assigned by expert judges. These weighted scores were summed to determine the GDEI score for each respondent. It was ensured that all sub-dimensions, identified as key components of Group Dynamics Effectiveness (GDE), held high significance, as confirmed by the coefficient of agreement in judges' ratings and statistical evidence from the pilot study. The content validity of the measurement device used for GDE was thoroughly assessed.

Measurement of Sub-Dimensions

A. Participation:

Participation was defined as the extent to which a member engages in group meetings, discussions, and activities within the Self-Help Group (SHG).

B. Influence & Style of Influence:

Influence was defined as the ability of a member to impact other SHG members in a positive manner.

Style of influence referred to the method a member uses to influence others, which was categorized into four styles: autocratic, peacemaker, laissez-faire, and democratic.

C. Decision-Making Procedures:
This sub-dimension measured the degree to which a member contributes to decisions by involving others, avoids topic drifting, supports consensus, values the majority opinion, encourages participation, and feels recognized for their input in the decision-making process.

D. Task Functions:
Task functions were defined by the extent to which a member actively suggests solutions to group problems, summarizes discussions, provides feedback, offers ideas, and ensures the group stays focused on its objectives.

E. Maintenance Functions:
Maintenance functions measured how well a member assists others in group activities, fosters cooperative behavior, helps clarify ideas, and maintains the group's focus on both task and interpersonal harmony.

F. Group Atmosphere:
This sub-dimension assessed the degree to which a member values a friendly and supportive environment, works to resolve conflicts, encourages involvement, and is satisfied with the work climate within the SHG.

G. Membership:
Membership was defined as how accepted or included a member feels within the SHG, including whether they feel part of sub-groups or outside the main group.

H. Feelings:
Feelings were measured by the extent to which a member experiences emotions such as anger, frustration, warmth, affection, excitement, boredom, or competitiveness during group activities.

I. Norms:
Norms referred to the perceived standards, ground rules, and regulations that govern the behavior of members, ensuring the smooth operation of the SHG.

J. Empathy:
Empathy was defined as the ability of a member to understand and relate to the feelings of others within the group.

K. Interpersonal Trust:
This sub-dimension measured the level of trust a member has in others and the degree of trust other members place in them.

L. Achievements of SHG:
Achievements were assessed by how well the SHG performs as a collective, as well as the individual contributions and accomplishments of each member within the group.

Each of these sub-dimensions was measured using an inventory of relevant questions, rated on a three-point scale: *always*, *sometimes*, and *never*, with scores of 2, 1, and 0 for positive questions (and vice versa for negative questions). This structured approach allowed for an in-depth analysis of the dynamics within the Self-Help Groups and their effectiveness.

The cost estimates for all the selected Self-Help Groups (SHGs) were also calculated, focusing on major expenditures essential for mussel farming. These included costs for materials such as bamboo, nylon rope, coir, cloth, and seed, as well as labor costs covering construction, seeding, harvesting, and other critical activities. Additionally, the Net Operating Profit and Benefit-Cost (B:C) ratio

were computed for each SHG, providing valuable insights and enabling the drawing of meaningful conclusions from the financial data.

Results and discussion

Table 1 presents the basic data related to the fisheries sector of Kasargod district. The study focused on Group Dynamics Effectiveness (GDE) as a characteristic of Self-Help Groups, shaped by the collective influence of individual members. This influence is drawn from their skills and life experiences, which naturally vary from person to person, place to place, time to time, and situation to situation. As a result, the degree of GDEI observed among the respondents differs, reflecting these diverse factors and circumstances.

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 Fisherfolk population 2004-2005	45989
5	Active marine fishermen	10566
6	Inland Fisherfolk 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 primary expenditures for mussel farming include materials such as bamboo, nylon rope, coir, cloth, and seed, along with labor costs for construction, seeding, and harvesting. Women's Self-Help Groups (SHGs) under the DWCRA scheme began mussel farming

as early as 1996-97, with each member receiving a loan of Rs 8,800, accompanied by a subsidy of Rs 4,400. The loan has a 5-year term and an interest rate of 12.5% per annum. In addition, a revolving fund of Rs 5,000 was provided interest-free. As these SHGs become economically empowered through loan facilities, the returns from mussel farming allow them to gradually repay the loans.

The loans were disbursed through the Farmers' Service Cooperative Banks and North Malabar Gramin Banks in the Cheruvathur and Padanna panchayats of Kasargod district. The majority of SHGs showed remarkable progress in repaying the loans, indicating the profitability of mussel farming. The expenditure details for the selected SHGs during the initial year of mussel cultivation are presented in Table 2.

The Net Operating Profit across all six SHGs was found to be significantly positive, confirming the profitability of mussel farming even in its early stages. Furthermore, as material costs like bamboo, rope, cloth, and labor costs for construction decrease in subsequent years, it ensures a steady and reasonable profit. This, in turn, highlights the economic empowerment of rural women through the organized efforts of Self-Help Groups and the adoption of mussel farming as a sustainable enterprise.

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 have shown that developing a Self-Help Group (SHG) requires a minimum of 36 months and is a demanding process. The group progresses through various phases: the Formation phase, Stabilization phase, and Self-Helping phase. These phases cultivate a cooperative and participative culture among members, fostering the empowerment culture during the Self-Helping phase. The successful sanctioning and utilization of loans, diligent maintenance of accounts, and timely repayment are all meticulously managed by the group members, ensuring the proper documentation of records. This adherence to norms and standards confirms the group's success and leads to the economic empowerment of its members. A clear proportional relationship between the Benefit-Cost (B:C) ratio and the Group Dynamics Effectiveness (GDE) index is observed, as shown in Table 2.

2. Case Study: Mussel Farming Self-Help Groups in Karwar, Karnataka

Self-Help Groups (SHGs) of fisherfolk were mobilized by CMFRI in the coastal belts of Karwar and Bhatkal, Karnataka. A total of six SHGs, with 15 members each (45 members per site), were formed across two key locations: Majali (Open Sea) and Sunkeri (Kali Estuary) in the Uttar Kannada district. Training and demonstration programs on mussel farming were conducted in these regions. Two distinct training sessions were held: one focusing on raft culture in the open sea at Majali, and the other on rack culture in the Sunkeri estuary.

In Majali, a 5x5 meter raft was constructed for mussel farming in the open sea, while at Sunkeri, a 5x5 meter rack was set up for mussel culture in the Kali estuary. Additionally, in the Bhatkal estuary, four Self-Help Groups of women fisherfolk, under the NGO 'Snehakunja', comprising 60 participants, were trained on mussel farming. They initiated a trial using a 5x6 meter rack culture by the long-line method.

The study involved gathering data through personal interviews with members of these 10 SHGs. Group Dynamics within these SHGs was assessed using the Group Dynamics Effectiveness Index (GDEI). Growth parameters were monitored weekly across all sites, and mussel yield details were recorded during the harvesting phase for each SHG.

For further reference, the sample design for the study, including the number of trained SHGs, beneficiaries, and the method of culture used, is provided 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

Results & Discussion

The primary expenses involved in mussel farming include materials such as bamboo, nylon rope, coir, cloth, and seed, as well as labor costs for construction, seeding, and harvesting. The Self-Help Groups (SHGs) in Majali and Sunkeri were mobilized by the CMFRI project team, while the SHGs in Bhatkal were supported by the NGO Snehakunja. The first two trials and demonstrations were funded by CMFRI, while CMFRI only provided technical assistance during the training and demonstration for the third trial. The yield in all ten SHGs was found to be significantly good, confirming the profitability of mussel farming. Over time, as material costs such as bamboo, rope, cloth, and labor for construction decrease, reasonable profits emerge, making mussel farming a viable enterprise that contributes to the economic empowerment of rural women through organized SHGs.

However, the open-sea mussel culture encountered a setback due to sabotage of the seeded mussels by miscreants. Although reseeding was done, the yield did not match the success of the estuarine trials. Despite this, the yield per meter length of rope in all SHGs showed a positive relationship with the Group Dynamics Effectiveness Index (GDEI). A significant correlation ($r = 0.958139$) was observed, with a 't' value of 9.465624 at a 1% level of significance (Table 4).

Previous experiences have shown that the development of an SHG requires at least three years, passing through distinct phases: Formation, Stabilization, and Self-Helping. These phases foster a cooperative and participative culture, contributing to the empowerment of group members during the Self-Helping phase. Fund utilization, account maintenance, and proper documentation are all meticulously handled by group members, ensuring compliance with SHG norms and standards. This adherence leads to the economic empowerment of the members.

As seen in this case, a positive correlation between yield and GDEI is evident. One of the key dimensions of GDEI is the achievement of the SHG, which directly correlates with yield and economic success from the SHG's micro-enterprise. Thus, it is natural to observe a positive relationship between yield, the B:C ratio, and GDEI.

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		
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		

3. Case Study on Mussel Farming Technologies in a Gender Perspective in Kollam District, Kerala

This study aims to assess the adoption of mussel farming technologies in Kollam, Southern Kerala, with a focus on gender

dynamics. Specifically, it examines how mussel farming serves as a supplemental income source for rural fisherfolk, particularly through women's Self Help Groups (SHGs). The experimental trials conducted by CMFRI have demonstrated the techno-economic feasibility of brown mussel farming in the region. Kollam, renowned for brown mussel farming, has seen the active participation of women's SHGs organized through Kudumbashree Ayalkoottams. Analyzing the outcomes and cost dynamics of mussel farming within these groups is crucial to understanding its impact on women's economic empowerment.

Geographical Overview of Kollam District

Kollam, an ancient seaport town on the Arabian coast, is strategically located with approximately 30% of the district covered by the Ashtamudi Lake, making it the gateway to Kerala's scenic backwaters. Kollam is a microcosm of Kerala's natural beauty, offering a mix of coastal areas, lakes, plains, mountains, rivers, and streams. It has a land area of 2,491 km² and a population of 2.58 million, with an impressive literacy rate of 91.49%.

Agriculture plays a vital role in the economy of Kollam, with a total cultivated area of 218,267 hectares. The principal crops include paddy, tapioca, coconut, rubber, pepper, banana, mango, and cashew. Approximately 70% of the workforce is engaged in agriculture. The district is also known for its extensive coconut gardens, which span 75,454 hectares. Notably, small and marginal farmers represent over 95% of the farming community, with an average per-family landholding of 0.21 hectares.

Fisheries Sector in Kollam

Kollam is a key maritime district in Kerala, with a coastline of 37.3 km. The fishing industry is integral to the district's economy, with key fishing villages such as Neendakara and Sakthikulangara thriving on fishing and allied activities. Around 22,000 individuals

are involved in the fishing sector. The district has 26 significant fishing villages, including Cheriazheekkal, Alappad, Pandarathuruthu, Puthenthura, Neendakara, Thangasseri, Eravipuram, Paravoor, and Thekkumbhagam, alongside 24 inland fishing villages.

The Government has taken steps to further enhance the fisheries sector by initiating the development of a fishing harbor at Neendakara, which is expected to increase fish production by 15%. Kollam contributes one-third of Kerala's total fish catch, with an annual average fish landing of 85,275 tonnes. The district also boasts 93 producer cooperatives, two credit cooperatives, and one marketing cooperative in the fisheries sector. Additionally, 38 Fishermen Development Welfare Cooperative Societies (FDWCS) are active in the region. Over 3,000 mechanized boats operate from the Neendakara fishing harbor.

With the support of agencies like FFDA and VFFDA, Kollam is also a hub for freshwater fish culture and prawn farming. The district produces approximately 60% of Kerala's prawn production, further solidifying its prominence in the state's fisheries industry.

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

This comprehensive picture of Kollam highlights its rich natural resources and the robust role of fisheries in the local economy, setting the stage for understanding the broader impact of mussel farming, particularly for women's empowerment through organized Self Help Groups.

Methodology

This study was conducted in the Kaunagappally Thaluk, located 27 kilometers north of Kollam, well-connected by both rail and road. The villages selected for data collection were from the Thekkumbhagam and Neendakara Panchayats within this Thaluk. Specifically, Dhalavapuram and Malibagam villages from Thekkumbhagam, and Pannakkal Thuruthu and Puthan Thuruthu from Neendakara were chosen. A total of 200 mussel farming households, mobilized into Self Help Groups (SHGs), were surveyed in these villages to represent the southern part of Kerala. Trained enumerators conducted separate interviews with both men and women of each household, using a pre-tested and structured interview schedule to assess gender needs and roles in mussel farming.

Additionally, four women's Self Help Groups from each Panchayath were selected for detailed case studies. Personal interviews were conducted with the members of these groups to gather in-depth insights (Table 6). A Benefit-Cost (B:C) ratio analysis was performed for each group, and the associated cost dynamics were calculated. The study also identified and documented the problems and constraints faced by the women involved in mussel farming.

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

Results and Discussion

Gender Roles and Needs in Mussel Farming

In Kollam district, the study examined the gender roles in various mussel farming activities, gender-specific needs, decision-making, and access to resources. Overall, both men and women shared similar perspectives, with no significant differences in their views. However, notable gender-based variations were observed between the villages. One significant finding was that accounting and financial transactions were primarily managed by women. Both men and women identified the timely availability of spat as the most critical requirement for successful mussel farming. In terms of participation and needs, both genders expressed similar opinions on the matter. These findings align with Sahoo et al. (2009), who noted that gender roles in mussel farming are largely collaborative. Furthermore, the study analyzed the socio-economic, technological, and export support necessary for gender mainstreaming in the industry.

Yield Aspects and Group Dynamics in Mussel Farming

The major costs involved in mussel farming are materials such as bamboo, nylon rope, coir, cloth, seed, and labor for tasks like construction, seeding, and harvesting. The relationship between yield and Group Dynamics Effectiveness Index (GDEI) for the selected SHGs is illustrated in Table 7. The yield, measured in kilograms per meter of rope, showed a strong positive correlation with GDEI scores, with a correlation coefficient of (r = 0.92025).

Case studies of women-led Self Help Groups in Kollam further highlighted that it takes at least 36 months for a group to fully develop into a successful and self-sustaining SHG. After the third year, most of the groups in the study areas entered the Self Helping phase, where they fostered a cooperative, participative, and empowerment-driven culture. These groups demonstrated excellent management in loan sanctioning, fund utilization, account maintenance, and timely repayment, all while meticulously keeping records. This effective organization and discipline played a crucial role in the economic empowerment of the members, ensuring the sustainability and growth of mussel farming through SHGs.

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	

Problems and Constraints in Mussel Farming from a Gender Perspective

Mussel farming faces various challenges, including water salinity, seed availability, site selection, climatic conditions, and proper monitoring. The key problems and constraints faced by women in

mussel farming, ranked in order of significance, include unpredictable seed availability, difficulties with meat shucking, marketing challenges, seed mortality during transportation, reduced growth in certain years, and, to a lesser extent, social constraints like caste divisions and conflicts.

All group members are in unanimous agreement that improved marketing facilities, particularly those supported by government agencies, are crucial, as marketing is considered one of the biggest obstacles. The introduction of low-interest loans and freezer facilities for storing harvested mussels could significantly boost this sector.

The adoption of mussel farming through organized women's Self Help Groups (SHGs) in North Malabar and South Quilon areas of Kerala has proven to be highly profitable. Mussel farming has the potential to become a fully developed, women-driven enterprise in Kerala. Gender considerations play a critical role in site selection and the various operations of mussel culture, and an assessment of gender roles and needs is essential for the success of these farming initiatives.

Further research is needed on the drudgery involved in mussel farming, the impact of coir retting zones on seed growth and attachment, and the broader effects of these zones on mussel development. Additionally, laboratory experiments should be expanded to study these factors. The export potential of mussels can be enhanced through value-added processes like depuration in filtered seawater. Organized fishermen's cooperatives can play a key role in various stages of mussel farming, from seeding to marketing, with a particular focus on export opportunities. This study underscores the importance of gender roles and needs in mussel farming, ultimately advocating for economic empowerment and poverty alleviation through Self Help Groups (SHGs).

Conclusion

This study assesses the socio-economic impact of mussel farming through Self Help Groups (SHGs) in the coastal areas of Kasargod and Kollam in Kerala, and Karwar in Karnataka. Mussel farming has gained significant traction due to its profitability, but attention must be given to the selection of suitable sites that meet the essential parameters for successful mussel culture trials. Research on the impact of coir retting zones on seed growth and attachment should be expanded, as current observations indicate that these zones may not always be suitable.

The adoption of mussel farming by women's Self Help Groups in the North Malabar and South Quilon areas has proven especially profitable. To further promote mussel farming, the export potential can be enhanced through value addition processes such as depuration in filtered seawater. Organized fishermen's cooperatives will be crucial in improving various stages of mussel farming, including seeding, harvesting, sorting, grading, packing, and marketing for export.

As seed availability remains a major constraint, efforts should be directed toward scaling up mussel seed production technologies developed by CMFRI. The study revealed the profound impact of group dynamics within SHGs, shaped by participation, decision-making procedures, task functions, group atmosphere, interpersonal trust, and achievements. This reinforces the importance of organized SHGs in empowering rural women and alleviating poverty through mussel farming. The correlation analysis further supports the positive relationship between Group Dynamics Effectiveness and Average Yield, demonstrating the substantial profitability and economic empowerment resulting from mussel farming in organized Self Help Groups.

4. Dynamics of Women's Self Help Groups in the Malabar Fisheries Sector

(A Case Study of Women in Fisheries-Based Micro-Enterprises)

Case Study Overview:

Women have made significant contributions to the fisheries sector, especially in subsidiary activities related to capture fisheries, such as processing, value addition, sorting, grading, peeling, trading, and aquaculture practices like breeding and rearing fish, as well as marketing. In coastal fishing communities, families are heavily dependent on sea resources for their livelihood. The roles of Self Help Groups (SHGs) of women fisherfolk in the marine fisheries sector, which are mobilized through appropriate micro-enterprises in fisheries and diversified sectors, are pivotal in sustaining and enhancing the economic well-being of their families.

This case study, conducted in the Malabar region of Kerala, aimed to assess the Group Dynamics of women's SHGs to identify key factors contributing to their effectiveness and to uncover the challenges these women face in order to develop strategies for mobilizing more effective SHGs. From each of the four districts of Malabar—Kasargod, Kannur, Kozhikode, and Malappuram—three SHGs were randomly selected. The Group Dynamics of each SHG was evaluated using the Group Dynamics Effectiveness Index (GDEI), which included 12 dimensions: participation, influence and styles of influence, decision-making processes, task functions, maintenance functions, group atmosphere, membership, feelings, norms, empathy, interpersonal trust, and achievements of the SHG. The findings revealed significant variations in Group Dynamics, with the key dimensions influencing GDEI being the achievements of the SHG, participation, and group atmosphere. Personal and socio-psychological characteristics, such as education, income, socio-economic status, extension orientation, scientific orientation,

participation in mass media and social activities, cosmopolitanism, knowledge, attitude towards the SHG, and information use patterns, all had a positive and significant impact on GDEI. Empowerment programs were designed based on the ranking of preferred micro-enterprises in fisheries and allied sectors. Success stories showcasing the economic empowerment of women's SHGs were also highlighted. The constraints faced by these women were identified and ranked, and a strategy for mobilizing effective SHGs in the fisheries sector was developed.

Women's Self Help Groups in the Malabar Fisheries Sector

Women play a crucial role in the fisheries sector, particularly in subsidiary activities such as processing, value addition, sorting, grading, peeling, trading, and aquaculture practices, including breeding and rearing fish, and marketing. Coastal fishing communities depend almost entirely on marine resources for their livelihood, and the contribution of SHGs of women fisherfolk in establishing micro-enterprises within the fisheries and diversified sectors is central to the economic prosperity and sustainability of their families. Women in these communities are often the most vulnerable, experiencing deprivation and destitution. Thus, poverty alleviation programs should focus on improving the living conditions of women by creating sustainable livelihood opportunities.

In recent years, micro-credit-based poverty alleviation schemes have been implemented across many developing countries, including India, to address these issues. These schemes have been reinforced by state actions and institutional formations to streamline and successfully implement poverty alleviation programs (Yaron, 1992; Yunus, 1999).

In Kerala, the role of SHGs organized by women fisherfolk is critical in the fisheries sector, particularly in maritime states along India's coastal belts. Despite the economic and socio-cultural

importance of fishing in the state, women fisherfolk often remain marginalized, excluded from the benefits of the fishing industry (Kurien, 1994). The Malabar region, which makes up about half of Kerala's coastline, has lagged behind the rest of the state in terms of development (MCITRA, 2003). Fisherwomen in this region rarely benefit from the booming fish production, as fisheries development has often been separated from the advancement of fishing communities.

It is therefore important to examine the group dynamics of existing SHGs mobilized by development agencies to empower women in the Malabar fisheries sector. The sustainability of these SHGs—whether they are temporary initiatives or will continue in the long term—needs to be critically analyzed (Fernandez, 1995). Addressing the constraints these women face and adopting viable micro-enterprises in fisheries and related sectors will be essential to strengthen SHGs and empower women within the fishing community.

Focus of the Study

This case study in the Malabar region primarily aimed to achieve the following objectives:

- **Assessing Group Dynamics**: Evaluating the Group Dynamics of Self Help Groups (SHGs) formed by women fisherfolk, identifying the key dimensions that contribute to their effectiveness, and understanding the influence of personal and socio-psychological factors on these dynamics.
- **Empowering Women's SHGs**: Supporting the empowerment of women's SHGs through targeted training and the adoption of economically viable micro-enterprises in the fisheries and diversified sectors, while highlighting success stories of SHGs.
- **Identifying Constraints and Developing Strategies**: Identifying the challenges faced by women fisherfolk and formulating strategies to mobilize and strengthen effective SHGs, thereby addressing these constraints and enhancing their impact.

Quantification of Group Dynamics of Self Help Groups

Group Dynamics refers to the interactions and forces at play among members within a social group. It encompasses how groups are formed, their structures, processes, and how they function, influencing individual members, other groups, and the organization as a whole (Hersey & Blanchard, 1995). This study was conducted across four districts in the Malabar region of Kerala: Kasargod, Kannur, Kozhikkode, and Malappuram. In each district, three Self Help Groups (SHGs) of women fisherfolk were randomly selected, making a total of 12 SHGs. From each SHG, 15 women were interviewed using a pre-tested interview schedule.

To quantify the Group Dynamics of each SHG, an index called the Group Dynamics Effectiveness Index (GDEI) was developed. This index comprises 12 dimensions, as identified by Vipinkumar (1998) and Vipinkumar & Baldeo Singh (2001), including: Participation, Influence & Styles of Influence, Decision-Making Procedures, Task Functions, Maintenance Functions, Group Atmosphere, Membership, Feelings, Norms, Empathy, Interpersonal Trust, and Achievements of SHG. In this study, the GDEI was defined as the total of these forces acting among SHG members, based on these key dimensions.

Measurement of Group Dynamics Effectiveness

The 12 dimensions measured for the Group Dynamics Effectiveness Index are as follows:

Participation: The extent to which members are involved in group meetings and activities.

Influence & Styles of Influence: The nature of leadership and how influence is exerted within the group.

Decision-Making Procedures: The group's ability to make effective decisions.

Task Functions: The capacity of members to tackle problems and address challenges.

Maintenance Functions: The extent to which members maintain essential tasks within the group.
Group Atmosphere: The overall climate of the group, including its congeniality and supportiveness.
Membership: The level of inclusion and belonging within the group.
Feelings: The emotional engagement and expression within the group.
Norms: The rules and regulations that govern group behavior.
Empathy: The ability to understand and respond to the feelings of others.
Interpersonal Trust: The mutual trust and faith between group members.
Achievements of SHG: The overall performance of the SHG, including economic success and progress.
Each of these dimensions was measured through a set of inventories containing relevant questions (Pfeiffer & Jones, 1972). The total GDEI score for each individual was calculated by summing the individual scores across all components.

Location of Selected SHGs, Micro Enterprises, and GDEI Score

Table 1 presents the details of the 12 selected Self Help Groups (SHGs), their locations across four districts in the Malabar region, the corresponding micro enterprises, and their Group Dynamics Effectiveness Index (GDEI) scores. Based on the GDEI scores, steps were taken to empower the SHGs with the lowest scores, while success stories of women's empowerment from the SHGs with the highest GDEI scores in each district were highlighted.

Group Dynamics and Variability in GDEI Scores

The results, as shown in Table 2, indicated a significant variation in the GDEI scores across different SHG members and groups, as evidenced by the high variance ratio ($F=18.21$). Group Dynamics is a multifaceted phenomenon, shaped by a range of interacting factors. These factors vary in strength depending on individual skills, orientations, and past life experiences. Consequently, Group

Dynamics can differ from person to person, from group to group, and across different times, places, and situations. This variability helps explain the differential GDEI scores observed among the respondents.

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

District	Name of SHG	Location	Micro enterprise	GDEI Score
Kasargod	Kavunchira 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 Analysis of variance in Group Dynamics Effectiveness of SHGs

Source of Variation	Degrees of freedom	Sum of squares	Mean sum of squares	Variance ratio 'F'
Between groups	11	14368.06	1306.19	18.21**
Error	168	12064.26	71.81	
	179			

** Significant at 1% level of significance.

Influence of dimensions of Group Dynamics Effectiveness

The relationship of dimensions of Group Dynamics Effectiveness with GDEI was established in this study first by simple correlation analysis to identify the most important dimensions (Table 3).

Table 3. Simple correlation analysis of dimensions of Group Dynamics Effectiveness (n=180)

Variable No.	Characteristic	Correlation coefficient (r)
1.	Participation	**0.947****
2.	Influence and Styles of influence	0.938**
3.	Decision making procedures	0.919**
4.	Task functions	0.907**
5.	Maintenance functions	0.913**
6.	Group atmosphere	**0.945****
7.	Membership	0.874**
8.	Feelings	0.879**
9.	Norms	0.884**
10.	Empathy	0.869**
11.	Interpersonal trust	0.918**
12.	Achievements of SHG	**0.949****

** Significant at 1% level of significance

A perusal of the Table 3 indicated that, out of 12 dimensions, the degree of relationship with GDEI was maximum in the case of Achievements of SHG, followed by Participation and Group atmosphere.

Influence of Personal and Socio-Psychological Characteristics

Among the 17 personal and socio-psychological characteristics examined, Table 4 reveals that 14 variables—namely education, annual income, farm household size, socio-economic status, extension orientation, scientific orientation, mass media participation, social participation, cosmopolitanism, knowledge, attitude towards SHGs, attitude towards the intervening agency, attitude towards fellow farmers, and information source use pattern—were positively and significantly correlated with the dependent variable, "Group Dynamics," at the 1% significance

level. However, three variables—age, occupation, and fishing experience—were found to have no significant relationship with Group Dynamics.

Table 4. Relationship of personal and socio-psychological characteristics with GDEI (n=180)

Variable No.	Characteristic	Correlation coefficient
1	Age	0.087
2	Education	0.310**
3	Occupation	0.058
4	Annual income	0.503**
5	Farm household size	0.508**
6	Fishing experience	0.147
7	Socio-economic status	0.871**
8	Extension orientation	0.840**
9	Scientific orientation	0.813**
10	Mass media participation	0.479**
11	Social participation	0.687**
12	Cosmopoliteness	0.678**
13	Knowledge	0.767**
14	Attitude towards SHG	0.820**
15	Attitude towards intervening agency	0.791**
16	Attitude towards other members	0.782**
17	Information source use pattern	0.847**

** Significant at 1% level of significance

Micro Enterprises in Fisheries and Diversified Sectors

Empowerment programs were implemented in each district for the SHGs with the lowest GDEI scores, focusing on suitable micro enterprises in fisheries and allied sectors. These programs were based on the preference ranking of the SHGs. The preference

ranking of micro enterprises, tailored to the location-specific needs in fisheries and allied sectors across all four districts, was conducted. The identified and appropriate micro enterprises for each district are presented in Tables 5 and 6.

Table 5. 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 6. 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

A review of Table 5 highlights the promising potential of bivalve farming, particularly mussel culture, in the Malabar fisheries sector, as well as other activities such as processing, drying, and value addition, which are all highly viable fishery-based micro enterprises (Vipinkumar et al, 2001). Table 6 reveals a strong preference for agricultural-based enterprises in Malabar, including vegetable farming, ornamental gardening, and floriculture.

Additionally, allied sector micro enterprises such as glossary repacking and garment manufacturing show tremendous potential. A micro enterprise is defined as an activity requiring minimal capital, manpower, local raw materials, and a local market. These enterprises can be individual ventures, either known or unknown (Vedachalam, 1998).

Preference rankings for 12 fishery-based micro enterprises, 15 agricultural micro enterprises, and 15 allied sector micro enterprises based on their suitability in the northern coastal belts of Kerala are detailed in Tables 5 and 6. In the fisheries sector, successful micro enterprises developed through the availability of local resources and experiences include value-added fish units, dry fish units, fish processing units, ready-to-eat fish products, ready-to-cook fish products, ornamental fish culture, mussel culture, edible oyster culture, clam collection, and cage farming. In the agricultural sector, women's Self Help Groups have successfully ventured into vegetable cultivation, ornamental gardening, floriculture, kitchen gardens, orchards, fruit products, fruit processing, sericulture, mushroom cultivation, medicinal plants, vermi-composting, snack production, catering, bakery units, and cereal pulverizing units.

In allied sectors, micro enterprises undertaken by SHGs across Kerala include woodwork units, stonework units, soap production, garment units, computer centers, poultry farming, cattle rearing, piggery units, beekeeping, stitching units, hand weaving, candle production, chalk manufacturing, umbrella units, foam bed units, bamboo handicrafts, paper covers, scrap selling, vegetable seed production, marriage bureaus, medicine collection, patient services, real estate, medicine processing, direct marketing, coir brushes, plastic weaving, second-hand sales, meat masala production, pickle and spice powders, consumer service centers, home delivery services, repacking businesses, cleaning products, soap production, kids' garments, toffee and sweets, photocopying, emery powder, domestic animals, nursery plants, notebook production,

bookbinding, rubber slipper manufacturing, pillow cushions, incense stick production, cloth whiteners, eucalyptus oil, dolls, hand shampoos, soap shampoos, detergent shampoos, jackfruit jam, chips, catering services, grape wine, pineapple wine, soft drinks, chicken farming, dried mango wafers, gooseberry wine, ginger wine, papads, tomato sauce, day care centers, coconut water vinegar, syrups, artificial vinegar, mixed fruit jams, milk chocolate, tomato squash, gum production, cleaning lotions, soft drink shops, reading rooms, private tuition, counseling services, rent sales, and repair centers. These opportunities are contingent upon the suitability of local situations and the availability of resources.

The suitability of micro-enterprises varies based on the context. Key features for the success of viable micro-enterprises include the availability of sufficient local raw materials, ease of learning or familiarity with the enterprise, low production costs, high-quality products, and a readily available market for the products. Several financial organizations support SHGs by providing funding, including the Khadi and Village Industries Board, Department of Commerce & Industry, Jawahar Rosgar Yojana, Women Industrial Cooperative Societies, Kerala State Social Welfare Advisory Board, Kerala Financial Corporation, National Bank for Agriculture and Rural Development (NABARD), District Rural Development Agency (DRDA), and various Non-Governmental Organizations (NGOs), along with Kudumbashree Ayalkoottam groups.

The constraints faced by women fisherfolk in Malabar, both in general and as members of Self Help Groups (SHGs), are outlined in Table 7. While common challenges like poor living conditions, illiteracy, and unemployment are acknowledged, the focus of this study is on the specific constraints faced by SHGs. Among these, the marketing aspect was identified as the most significant barrier, overshadowing procedural challenges related to preparing minutes, reports, meetings, and banking. These priorities and constraints clearly indicate the urgent need for diversifying micro-enterprises within SHGs, in addition to those centered around

fisheries, for their long-term sustainability. Many women-led SHGs in Malabar have already begun exploring and diversifying into other viable enterprises within the fisheries sector.

Table 7. 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

Strategy for Mobilizing and Strengthening Effective SHGs of Women Fisherfolk

Based on the findings of the study, a comprehensive strategy for mobilizing and strengthening effective Self-Help Groups (SHGs) of women fisherfolk was developed through consultations with 6 social mobilization experts, 12 leader members from selected SHGs, and 12 officials from intervening agencies. This strategy is organized into three key phases of group development: **Group Formation**, **Stabilization**, and **Self-Helping**. Each phase outlines critical features, including norms and bylaws, to ensure the SHG's success. Below is a brief outline of the developed strategy:

1. Group Formation Phase (0 to 4 Months)

The initial phase involves laying the groundwork for the SHG. Key steps include:

- Conducting initial visits to the location, building rapport, and creating awareness among the women fisherfolk.
- Organizing introductory meetings to identify potential members and discuss the group's goals.
- Developing an action plan and documenting all deliberations.
- Mobilizing genuine members and holding follow-up meetings to address challenges and provide solutions.
- Organizing training on fishery-based and diversified micro-enterprises, with a focus on sourcing raw materials, gathering marketing information, and selecting 'Leader Fisherwomen' for roles in production, credit, and marketing.
- Conducting the first basic field training, followed by need assessments for future training programs focused on production technology and management.

2. Building Up / Stabilization Phase (4 to 15 Months)

In this phase, the focus is on strengthening the group's structure and functionality. Key steps include:

- Holding regular, need-based meetings to maintain momentum and address emerging issues.
- Training women leaders in production, credit management, and marketing, ensuring they are equipped to implement the action plan.
- Procuring necessary inputs based on the production plan aligned with market demands, and ensuring synchronized production planning.
- Providing intensive training on production, credit, and marketing aspects, with leaders teaching other members.
- Rotating the leadership within the SHG every year to provide new members with opportunities for leadership, while maintaining the role of intervening agencies as enablers.

3. Self-Helping Phase (15 to 36 Months)

The final phase focuses on ensuring the sustainability and autonomy of the SHG. Key steps include:

- Developing a fortnightly action plan for the group to continue refining, improving, and solving problems.
- Reducing the intervention of external extension personnel, allowing the SHG members to manage their own affairs independently.
- Rotating leadership every two years to ensure fresh leadership and maintain engagement within the SHG.
- Encouraging inter-SHG communication and fostering a competitive spirit through activities such as contests to recognize the best member or SHG.
- Establishing norms for defaulters and ensuring active participation in all activities for the SHG's continued success.
- Promoting a positive group atmosphere, empathy, and interpersonal trust to achieve significant outcomes and maintain the group's cohesion.

By following this strategy, SHGs of women fisherfolk will be better equipped to manage their micro-enterprises and continue making a positive impact on their communities.

Practical Utility

This study offers a glimpse into poverty eradication efforts within the Malabar Fisheries sector, focusing on the dynamics of women's Self-Help Groups (SHGs). The **Group Dynamics Effectiveness Index (GDEI)**, which encompasses 12 key dimensions, serves as a valuable tool for future research on community-based groups in fisheries and allied sectors. This framework can be applied to various groups, such as youth, laborers, and extension personnel, to assess and enhance their group dynamics.

The insights gleaned from the identified gaps in the GDEI provide essential feedback for improving the functioning of SHGs. Addressing these gaps can directly enhance the effectiveness of

SHGs. The successful case studies highlighted in this research can serve as model templates for mobilizing SHGs in other sectors, including **Agriculture**, **Forestry**, **Floriculture**, **Agro-based industries**, and **Watershed development**.

The strategy developed for mobilizing SHGs can be utilized as a practical manual for organizing and managing SHGs in any sector, ensuring their sustainability over time. Furthermore, the constraints identified within the SHGs, along with the preference ranking of micro-enterprises, offer valuable insights into the suitability of location-specific ventures in both **fisheries** and **diversified sectors**, fostering the economic empowerment of women fisherfolk.

The interrelationships among the identified variables act as catalytic points for promoting group empowerment. These insights can guide the strengthening of SHG functions, enhancing their ability to address challenges effectively. Ultimately, it is through mobilizing women to tackle their problems independently via SHGs that poverty eradication becomes a tangible reality.

5. Institution-Village-Linkage-Programme (IVLP) for Technology Assessment and Refinement (TAR) in the Coastal Agro-Ecosystem of Ernakulam, Kerala

A significant initiative aimed at empowering fisherfolk was undertaken through the **NATP-funded IVLP project**, with the primary objectives of assessing local needs, understanding the coastal agro-ecology, and refining production systems using advanced scientific management practices. The program aimed to enhance productivity, ensure sustainability, and improve farm systems, making them more equitable, stable, and profitable.

The IVLP was implemented in **Elamkunnapuzha Village**, located in **Vypeen Island, Ernakulam District, Kerala**, over the past three years. The project engaged **687 farm families**, representing a population of **3,435 stakeholders**. In this collaborative effort, **31 techno-interventions** were introduced, including **13 in fisheries**, **13**

in agri-horticulture, and **5 in livestock**. Additionally, **15 training programs** were organized, benefiting **576 farmers**. The strong linkages established during the program helped stakeholders sustain their efforts, leading to a lasting impact. This initiative has earned widespread acclaim and is now celebrated as the **"Elamkunnapuzha Model of Development."**

Key Techno-Interventions for Expansion

During the final phase, refined technologies were prioritized for horizontal expansion across Kerala. The six selected interventions included:

1. **Monoculture of Grey Mullet**
2. **Monoculture of Milkfish**
3. **Polyculture of Finfish**
4. **Integrated Nutrient Management (INM) in Coconut Plantations**
5. **Dairy Farming with Paragrass**
6. **Poultry Farming with the 'Gramalakshmi' Breed**

Projected Economic Impact

At just **25% adoption** across Kerala, the projected economic benefits from these six interventions are staggering:

- **₹420 crore** from an additional **60,000 tons of fish production**.
- **₹220 crore** from a surplus **1,000 tons of milk yield per day**.
- **₹12 crore** from enhanced poultry farming revenue.
- **₹190 crore** from increased productivity in coconut plantations in coastal districts.

Sustained Development and Market Support

Several IVLP interventions were sustained through the **ATIC of CMFRI**, which acted as a sales outlet for products from IVLP units. This platform provided a vital connection between the production units and the market, ensuring the long-term viability of the technologies introduced.

The **Institution-Village-Linkage-Programme** at Elamkunnapuzha stands as a beacon of sustainable development, illustrating how targeted interventions, scientific practices, and stakeholder collaboration can transform local economies and empower communities. This model now serves as an inspiration for scaling similar initiatives across other regions.

6. **Empowering Weaker Sections: Success Case Studies of Individual Achievements**

The empowerment of weaker sections, particularly fisherfolk, is vividly exemplified through success stories of individuals who achieved remarkable professional milestones, enhanced their earnings, and generated employment opportunities. These inspiring case studies highlight the transformative impact of strategic interventions and the resilience of individuals in overcoming challenges.

Self Help Groups (SHGs) mobilized around various micro-enterprises, with significant inspiration and support from **ATIC**, were also studied to uncover additional success stories. The role of ATIC in guiding and facilitating these SHGs was pivotal in turning small initiatives into thriving ventures.

Methodology for Livelihood Analysis

Data collection for the livelihood analysis involved a combination of methods, including:

- Existing information: Utilizing documented resources and records.
- People's perceptions and opinions: Gaining insights through interactive discussions.
- Direct observations: Studying real-time practices and outcomes.
- Personal interviews: Engaging with individuals to capture their lived experiences.

This comprehensive approach to livelihood analysis sought to uncover the strategies and assets individuals and households use to sustain their livelihoods. The analysis followed frameworks and methodologies from leading references in the field, such as: Aujimangkul et al. (2000), DFID (2001), Graham and Tanyang (2001), CBCRM Resource Center (2003), Arciaga et al. (2002), Ashby (2003) etc. These studies emphasize that a livelihood encompasses not just financial earnings but also the resources, strategies, and networks individuals and households deploy to build resilience and achieve sustainable development.

A Model for Inspiration

The success cases serve as a guiding light, demonstrating the transformative potential of strategic interventions, knowledge sharing, and community mobilization in improving the lives of marginalized communities. These stories are not just about economic gains but about restoring dignity, confidence, and hope for a better future.

(6.a) Dry Fish Processing: A Success Story of the 'Janani' Women's Self-Help Group at Elamkunnapuzha

The **'Janani' Self-Help Group** (SHG), based in Puthuvyppu Post, Elamkunnapuzha, Vypeen Island, has become a shining example of empowerment through sustainable fish drying practices, facilitated by the **CMFRI** intervention. This group, comprising 15 determined women, revolutionized their traditional fish drying methods into a commercially successful venture.

Drying fish was not new to these women. For years, they had been individually drying fish on a small scale, relying on traditional methods. However, the lack of hygiene in their processes led to significant wastage, yielding minimal profits. Most of the dried fish was used for household consumption, with the surplus sold locally, often door-to-door.

A Journey of Transformation

The President of the group, **Mrs. Chandramathi Appukuttan**, reflects on this transformation with pride. Having settled in Elamkunnapuzha after her marriage 20 years ago, she became part of a 13-member women's group in 1997. At the time, they relied on market surpluses during bumper fish catches for their drying activities. Though operational costs were low, the lack of hygienic practices resulted in poor product quality and low profits.

Everything changed when their group was selected by **ATIC of CMFRI** for targeted interventions under the **IVLP** program. Through this initiative, the group began processing high-quality fish on a commercial scale. The transition was accompanied by a host of improvements:

1. **Training and Awareness**

   Scientists from CMFRI provided hands-on training, introducing the group to hygienic fish-drying techniques, such as dip treatment using calcium powder. This knowledge dramatically improved the quality and shelf life of their products.

2. **Upgraded Infrastructure**

   The group received **special drying racks**, which minimized fish wastage during processing and maintained product quality. This improvement replaced the traditional methods of drying fish on open surfaces, reducing contamination and spoilage.

3. **Enhanced Packaging and Marketing**

   The group transitioned from using paper packing to high-quality, attractive packaging, making their products more marketable. New marketing outlets suggested by CMFRI further expanded their reach.

A Growing Impact

Mrs. Chandramathi remarks, "It feels like luck smiled upon us when ATIC of CMFRI chose our group for this program. With their inputs and support, we've learned hygienic processing methods and found better markets for our products. Today, our dried fish is in demand, and more women are inspired to take up similar ventures."

This success story highlights how scientific interventions and community support can empower marginalized groups, transforming traditional practices into scalable, sustainable businesses. The achievements of **'Janani' SHG** serve as an inspiring model for women across coastal communities to venture into profitable, hygienic, and sustainable fish-drying enterprises.

Conservation of Marine Resources: The Inspiring Story of Theeram Turtle Protection Group at Kolavi Palam, Payyoli

The picturesque **Kolavi Palam Beach**, near Payyoli in northern Kerala, is renowned for its seasonal gatherings of marine turtles during nesting periods. Inspired by the beauty and vulnerability of these creatures, a group of passionate young nature enthusiasts formed the **Theeram Nature Conservation Society** to safeguard this vital marine resource. Their commitment soon caught the public eye, with newspapers highlighting their dynamic efforts in marine conservation.

The remarkable work of Theeram quickly gained widespread recognition, prompting interventions from key stakeholders like the **Kerala Forest Department**, the **Kerala Forestry Project**, the **Malabar Coastal Institute for Training, Research and Action (MCITRA)**, and leading research institutions such as **CMFRI** and **IISR**. These collaborations focused on educating the public about the importance of sea turtle conservation and marine resource management.

From Awareness to Action

In 1992, the group launched awareness programs that resonated with the community, culminating in formal assistance from the Kerala Forest Department in 1998. Support included the establishment of two turtle hatcheries and sheds, along with the provision of lanterns, torches, and wages for six dedicated members. With this support, Theeram gained legal registration and began operating systematically.

The group transformed Kolavi Palam into a vital turtle breeding ground while also championing broader marine resource conservation. They connected with the **ATIC of CMFRI** to learn the principles of **Responsible Fisheries Management**, mangrove conservation, and ecosystem sustainability. ATIC provided essential materials such as bulletins on sustainable fisheries management, FAO's Code of Conduct for Responsible Fisheries, and national conference proceedings on marine turtles. Interactive meetings facilitated by CMFRI scientists at Kolavi Beach fostered knowledge-sharing with fisherfolk, reinforcing the group's efforts.

Overcoming Challenges

Despite facing significant hurdles such as severe sea erosion—which reduced the shoreline to just 350 meters—and the loss of several hatcheries, Theeram's dedication has not wavered. Over the years, the group has successfully released more than **40,000 turtle hatchlings** into the sea. They remain hopeful for a large arribada (mass nesting) in the near future.

Expanding Conservation Efforts

Theeram's impact extends beyond turtle conservation. The group has planted mangrove seedlings, nurturing them with unwavering commitment to restore natural habitats. They have also established a **nursery of forest trees** comprising 35 different species, raising approximately **30,000 seedlings** with assistance from the Forest Department. This initiative aims to create a permanent green infrastructure for the region.

Educating and Inspiring

The group organizes awareness camps, projects films, and conducts slide shows to educate the community on the importance of nature protection and mangrove conservation. They continue to maintain strong ties with ATIC, with frequent interactive discussions held both at Kolavi Palam and at ATIC, under the leadership of their President, **Sri Surendrababu**, and Secretary, **Sri Sureshbabu**.

The efforts of Theeram Nature Conservation Society stand as a testament to the power of grassroots action in conserving marine resources. Their unwavering commitment serves as an inspiration to many, showcasing the profound impact of collective effort in protecting our natural world. But as the time progressed, the present stage of Theeram is not at all conspicuous because of sea erosion and lack of government support.

(6.c) infish Culture: A Farmer's Success Story at Puthuvyppu

Mr. Karthikeyan, a 48-year-old resident of Thirunilathu, Puthuvyppu, Elamkunnapuzha, with a primary level education, has become a shining example of success in finfish culture. In 1996, he ventured into fish farming on his own 42 cents of land, initially facing several challenges. The land, overgrown with dense bushes, blocked the inflow and outflow of saline water, leading to silt accumulation and an increase in weed growth. Determined to turn his fortunes around, he cleared the bushes, deepened the area, and constructed temporary sluices at the eastern corner of the pond to facilitate water exchange.

Without hiring additional labor, Mr. Karthikeyan relied entirely on his family, particularly his wife, **Mrs. Isha**, who actively participated in all farm operations. Initially, he allowed the natural entry of species such as **gray mullets, pearl spot, and milkfish**, occasionally supplementing them with selective stocking of **Mugil cephalus**. However, the absence of a specific stocking rate and irregular feeding patterns resulted in low yields and minimal economic returns, barely sufficient to sustain the family.

The Turning Point

Mr. Karthikeyan approached **ATIC** and enrolled in the **IVLP program** of CMFRI. He received hands-on training on critical aspects of finfish farming, including the importance of maintaining functional sluice gates for effective water exchange, systematic stocking, and feeding protocols. Armed with newfound knowledge and guidance from scientists, he implemented these best practices in his farm operations.

Reflecting on his journey, he shares: *"The training I received completely transformed my approach to fish farming. By following the stocking and feeding methods suggested by the experts, my income from fish culture increased from Rs. 32,000 to nearly Rs. 55,000. This additional income allowed me to provide quality education for my daughters. Without a doubt, I owe this success to the IVLP program and the support from ATIC of CMFRI."*

A Remarkable Transformation

Today, Mr. Karthikeyan's farm stands as a model for aspiring fish farmers in the region. His journey underscores the potential of adopting scientific methods and leveraging institutional support to achieve both personal and professional growth.

(6.d) Crab Culture & Crab Fattening: A Farmer's Success Story at Malippuram

Sylvi Figerado, a dynamic farmer from Pathissery, Malippuram, Elamkunnapuzha, has achieved remarkable success in **crab monoculture** using CMFRI technology. A matriculate by education, Figerado initially leased a 6-acre pond for shrimp farming after an unsuccessful stint as a boat owner during the 1980s. His fishing business suffered significant losses, leaving him in financial distress. At the time, his two young sons were unable to contribute to the family income, prompting him to explore other avenues.

The Transition to Crab Culture

With guidance from the **IVLP team of CMFRI** and regular farm advisory support from **ATIC**, Figerado decided to try crab farming. Initially skeptical, his doubts and reluctance toward crab culture were dispelled through consultations and hands-on advice on critical aspects like water exchange, stocking quality seeds, uniform seed size selection, farm management, and feeding techniques. His wife, **Juliet**, also 53, played a vital role, providing unwavering support in all farming operations.

Financial Success

In 2002, the couple earned an impressive profit of ₹47,000 from a single harvest, and their earnings crossed ₹50,000 in the next cycle. This upward trend has continued, and Sylvi and Juliet now confidently rely on crab farming as a consistent source of income. They proudly state:

"Whenever we need money, we just sell crabs and get the required amount instantly. Crab farming is undoubtedly the best technology for generating high profits with minimal risk."

Diversification and Sustainability

Sylvi and Juliet have further diversified their farming activities by integrating **duck farming** and **homestead vegetable cultivation**, including bitter gourd and cowpea. The ducks' excreta serve as organic manure for their homestead garden, enhancing soil fertility and sustainability.

Their journey exemplifies how adopting innovative technologies and sustainable practices can transform lives, making Sylvi and Juliet role models for aspiring farmers in the region.

Other projects for Self Help Groups

Under **SCSP scheme**, the DST funded project on 'Empowerment of SC fisherfolk through Entrepreneurial Capacity Building of SHGs in marine sector' an amount of 7 lakhs and under the project on Science Technology and Innovation Hub in Fisheries Sector, Kochi Corporation, Ernakulam district, Kerala State' Rs. 86 lakhs have been utilised for the following number of startups mobilised for 91 SHGs representing 576 beneficiaries. The training on the technologies to the SHGs was essentially undertaken with the assistance of KVK, Ernakulam.

1. Cage farming-16
2. Pearlspot seed production-7
3. Fish culture-10
4. Fish fertiliser production-3
5. Value added fish production-13
6. Mussel culture-5
7. Oyster-5
8. Clam units -5
9. Integrated fish farming- 8
10. Ornamental fish culture-10
11. Dry fish unit-3
12. Fish vending units- 6

Under the project on Science Technology and Innovation Hub in Fisheries Sector, Kochi Corporation, Ernakulam district, Kerala State' an interactive kiosk on fishery-based interventions, entrepreneurial consultancy cell, entrepreneurial data documentation cell with smart class set up and digital training hall and a mobile training unit embedded with a lab facility with all digital devices for imparting filed training to farmers have been mobilised. The adoption of innovative farming technologies, including cage culture, mussel and oyster farming, marine ornamental fish cultivation, scientific fish farming, and advanced seed production techniques, has been actively promoted to empower Self-Help Groups and enhance sustainable livelihoods.

Amble research on the fish farming technologies with practical application such as Cage culture, Mussel & Oyster culture, Seaweed farming, Marine ornamental fish culture has been done and these technologies have been brought out for enhancing the income of farming communities.

Under the Government Scheme, the Department of Science and Technology (DST) granted 2 funded projects to offer technological and scientific aid to farmers as the following:

1. 'Empowerment of SC fisherfolk through Entrepreneurial Capacity Building of SHGs in marine sector' with a financial outlay of Rs 26 lakhs (2019-22)
2. 'Science Technology and Innovation Hub in Fisheries Sector, Kochi Corporation, Ernakulam district, Kerala State' with a financial outlay of Rs 3.2 Crores (2022-25)

A project proposal focusing on fishery-based entrepreneurial technologies for the Scheduled Tribe community in Lakshadweep Islands and Kerala has been meticulously prepared and is ready for submission to the Department of Science and Technology (DST), New Delhi for external funding.

- Odede, K. (2023). Empowered Women Can Transform the World's Poorest Communities. Time. Retrieved from Time
- Kato, M. P., & Kratzer, J. (2013). Empowering Women through Microfinance: Evidence from Tanzania. ACRN Journal of Entrepreneurship Perspectives, 2(1), 31-59.

Under the umbrella of "Redefining Lives," a collection of inspiring case studies highlights the transformative power of Self-Help Groups (SHGs) and their role in economic and gender empowerment. (Kumar and Corbridge (2002), Holvoet (2005), Sanyal (2009), Swain and Wallentin (2009), Deininger and Liu (2013), Kato and Kratzer (2013), Desai and Joshi (2014), Brody et al. (2015), Datta (2015), and Odede (2023).) These case studies, drawn from the researcher's dedicated projects undertaken throughout the coastal belt of the country, exemplify how community-driven

initiatives can uplift marginalized sections of society, particularly women in fisheries and allied sectors.

These narratives emphasize the interplay of collective effort, scientific intervention, and grassroots innovation, revealing how SHGs serve as catalysts for holistic empowerment. Beyond economic gains, they foster self-reliance, gender equity, and environmental stewardship, offering replicable models for broader community development. Together, these stories reflect the profound potential of empowering lives through purpose-driven collaboration and resource optimization, painting a compelling picture of transformation and hope.

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