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Extension of Mussel Farming Through Community Participation In Karnataka- A Case Study

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ABSTRACT

Mussel Culture offers immense scope for development in our open waters for enhancing food and livelihood security of the fisherfolk, the vulnerable sections of our society. Self Help Groups (SHGs') do play a vital role in management of common property resources through community participation. Three case studies on Dynamics of Self Help Groups in Mussel Farming in open sea and estuaries in Karnataka coastal belts were explored for the present study. SHGs' were mobilised in Karnataka coastal belts and offered training through demonstration on mussel culture in open sea and estuaries at three sites namely Majali, Sunkeri and Bhatkal. Initially, training and demonstration programmes in 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 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 estuary, a 5 x 5 metre rack were constructed for mussel culture. In Bhatkal, 4 Self Help Groups of 15 members each exclusively of women fisherfolk comprising a total of 60 participants were trained on mussel farming with a trial in 5 x 6 metre rack culture by long line method in Mundalli river of Bhatkal estuary. The Effectiveness on Group Dynamics of these SHGs' was worked out based on Group Dynamics Effectiveness Index (GDEI) consisting of twelve sub-dimensions. The results showed significant variation in Group Dynamics and revealed that all twelve dimensions were positively correlated with GDEI. The most important dimensions affecting Group Dynamic Effectiveness are Group Atmosphere, Participation and Achievements of SHG. The findings of the study serve as a model for mobilizing Self Help Groups for group action. The scale of Group Dynamics Effectiveness Index can be used in similar future research in allied sectors. The identified interrelationships between the variables act as catalytic points for promoting group empowerment, which might give useful insight on the plausibility of using the group dynamics network for strengthening the functioning of SHGs'. The Net Operating Profit in all the SHGs' was positive in the initial trial itself indicating increasing returns in subsequent operations providing opportunities for economic empowerment of rural poor especially fisherwomen through organised Self Help Groups. Though the lucrative Goa market proximity was an added advantage for these mussel culture trials, appropriate strategies to address the socio-legal issues encountering mussel farming, awareness building and market development are the inevitable requisites for further expansion of mussel culture through community participation for sustainable development.

Key words : Self Help Group, Group Dynamics, Index, Community Participation, Sub-dimensions, Constraints, Mussel Culture etc

Introduction

Community participation can bring about judicious utilization of common property resources for sustainable development without endangering the environment is. Mussel Culture offers ample scope for development in our open waters for enhancing food and livelihood security of the stakeholders in our coastal agro climatic zones. It has already been proved as one of the profitable enterprises in the coastal belts as a subsidiary income-deriving source of rural fishermen community. The experimental trials conducted by CMFRI have proved the techno-economic feasibility of mussel farming. (Asokan et al, 2001 and Vipinkumar.V.P et al, 2001). Here an attempt has been made on exploration of a case study in Karnataka on socio economics of Self Help Groups of fisherfolk engaged in Mussel Farming.

A Self Help Group (SHG) consists of members linked by a common bond like caste, sub-caste, community, place of origin, activity etc.. The Group Dynamics of these SHG's 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.

Materials and Methods

Ten Self Help Groups of fisherfolk 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, 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. 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.

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.

Self Help Groups (SHGs') of fisherfolk were mobilised in *Karwar* and *Bhatkal* locations of Karnataka coastal belts. Three SHGs' of 15 members each comprising a total of 45 were mobilised in *Majali* (Open Sea) of *Dhandebag* and three SHG's 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 1.**

Results & Discussions

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 SHG's 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' was 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 yield in Kg per metre length of the rope recorded in all SHGs' as Average Yield showed a positive relationship with GDEI score. The correlation (r = 0.958139) was found significant owing to the 't' value 9.465624 at 1% level of significance. **(Table 2,3,4 and 5.)**

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 utilization of fund sources, accounts maintenance 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.

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Constraints faced by the fisherfolk 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 fisherfolk in mussel cultivation are as follows

- Unpredictable seed availability.
- Mortality of seeds during transportation.
- Reduced growth during certain years.
- **Meat shucking problems.**
- Marketing of mussels.
- Social constraints like caste splits, conflicts, politics etc. to a limited extent.

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. All the SHG 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. Though the lucrative *Goa* market proximity was an added advantage for these mussel culture trials, appropriate strategies to address the socio-legal issues encountering mussel farming, awareness building and market development are the inevitable requisites for further expansion of mussel culture through community participation for sustainable development.

Conclusions

An attempt has been made to assess the socio economic impact of mussel farming by mobilizing Self Help Groups in *Kerala* and *Karnataka* coastal belts. Mussel farming is slowly 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.

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 in various stages of seeding, harvesting, sorting, grading, packing, and marketing with an intention of export potential.

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.

Table 1: Mussel culture interventions in 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* *(Open sea)*	3	45	Raft culture	5 x 5 m
Bhatkal of *Mundalli* estuary	4	60	Raft culture	5 x 6 m

Table 2 : Relationship of Yield and GDEI of SHGs'

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		

Table 3 : Details of Mussel growth and Ecological Parameters in *Kali* estuary in *Karwar*

Date	Average length in mm	Weight (gm)	Mean Weight (gm)	Salinity ppt	Temperature o c	pH
08.12.03	28.41	1.72	0.54	35	29	6.27
24.12. 03	34.15	2.1	0.96	30	30	6.56
21.01.04	47.5	7.9	2.42	25	29	7.5
19.02.04	49.6	10.1	2.95	27	29	7.43
21.02.04	56	30.4	4.2	30	30	7.7
18.03.04	57	30.5	5.3	32	31	7.8
15.04.04	64	15.9	6.8	20	32	7.6
07.5.04	78	29.9	9.9	27	31	7.3

Table 4 : Details of Mussel growth and Ecological Parameters in *Mundalli* estuary in *Bhatkal*

Date	Average length in mm	Weight (gm)	Mean Weight (gm)	Salinity ppt	Temperature o c	pH
22.02.04	33.2	3.26	0.8	30	28	7.8
18.03.04	44.3	8.02	2.2	32	30	7.6
15.04.04	56.2	13.6	5.4	20	32	7.2
07.5.04	70.6	18.3	6.2	27	31	7.7

Table 5 : Details of Mussel growth and Ecological Parameters in open sea at *Majali* of *Dhandebag*

Date	Average length in mm	Weight (gm)	Mean Weight (gm)	Salinity ppt	Temperature o c	pH
22.02.04	33.2	3.26	0.8	30	28	7.8
18.03.04	44.3	8.02	2.2	32	30	7.6
15.04.04	56.2	13.6	5.4	20	32	7.2
07.5.04	70.6	18.3	6.2	27	31	7.7

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