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- Conservation
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GOI-UNDP-GEF PROJECT SINDHUDURG

Oyster farming by women self help groups At Wadatar, Sindhudurg district in Maharashtra State

Asokan P.K[1], Mohamed.K.S[1], Vipinkumar V.P[1] Kripa.V[1], Sasikumar.G[1], Vidya, R[1] Kaladharan.P[1], Alloycious,P.S[1], Jestin Joy.K.M[1], Digamber,P.B[2], Surendranathan,V.G[2], Rohit.S[2], Suhail.J[2], Daya.P[2], Durga.T[2] and Ghosh,S[2].

[1]*Central Marine Fisheries Research Institute, PB No: 1603, Ernakulam North P.O, Kochi- 682018.*
[2]*Sindhudurg Project, Office of the Range Forest Officer, 48-1, Dhananjay Niwas. Medha Malvan-416606, Sindhudurg District, Maharashtra-416606.*

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Abstract:

Practical dissemination of bivalve farming technologies in the potential maritime locations of Sindhudurg district was undertaken by ICAR-CMFRI. Initially a demo-oyster farm was setup in Wadatar, in Sindhudurg District under the UNDP-GEF funded project "Demonstration of bivalve farming at Sindhudurg District in the State of Maharashtra". The training and demonstration for oyster farming was given to the Self Help Groups-SHG, *"Prasidhi"* consisting of 10 members. Five hundred strings containing 7,000 numbers of oysters were harvested. Each string consists of 10-15 live oysters. Live oysters were sold at the rate of Rs. 150-200 per dozen. A total profit of Rs.45,000 was realized. This successful case study can be used as a case manual for group action for bivalve farming technology.

Construction of a rack at Wadatar

Training on oyster farming at a culture site in Sindhudurg

Introduction:

Subsistence fishery of bivalves is an age old practise in many coastal areas of the country. The culture of edible oysters was pioneered by James Hornell in Pulicat lake (Hornell,J. 1910 a,b). After a gap of seven decades, farming of edible oysters was taken up at Tuticorin Research Centre of CMFRI-Central Marine Fisheries Research Institute (Nayar and Mahadevan,1983). Initially, rack and tray method for rearing was followed with lime coated semi-cylindrical terra cotta roof tiles used as cultch material for spat settlement. Later, rack and string method was used wherein the oyster shells were the cultch material, which reduced the cost of material and labour. Rope culture of mussel in rafts was first tried in the open sea at Vizhinjam and Calicut centres of CMFRI in the 1970s (Appukuttan *et al*.,2000). Later, success in rope culture system by rack culture in the backwaters helped in popularising mussel farming in Kerala and later in Karnataka where the wild seeds of mussels are available However, this operation is restricted to the non-monsoon period. The production of farmed mussel in our country is near 8,000 tonnes. The production is mainly from Padanna, Kannur and Calicut in North Kerala and in Dakshin Kannada district of Karnataka (Mohammed *et al*.,1998; Sasikumaar *et al*.,2000). Oyster farming is mainly practised in Quilon, Allepey and Ernakulam districts of Kerala. This successful model of popularising bivalve farming has been adopted in Sindhudurg.

Maritime states along both the coasts of India have an extensive network of estuaries. These estuaries are subjected to wide variations in hydrographic condition due to the southwest monsoon during June to September and a less intense northeast monsoon from October to November. It is the non-monsoon period that is conducive for mussel farming.

Oyster farming has been proved as one of the profitable ventures in marine fisheries sector of the coastal belts of Maharashtra, successfully undertaken by mobilizing the women's self help groups. The CMFRI has successfully demonstrated oyster farming in the estuarine areas of the Sindhudurg district in Maharashtra, which has resulted in a positive socio-economic impact on the coastal fishing community especially among women. Edible oysters are one of the most widely cultivated bivalve mollusc all over the world. Being filter feeders, the oyster converts primary production in the water into nutritious sea food. Farming of these filter feeding bivalves has the advantage of being an eco-friendly aquaculture practice as there is no addition of feed to the system and hence feed cost and effort is also saved. As compared to other aquaculture technologies, oyster farming does not need very sophisticated practices and hence the outlay in capital is also less. The culture period is short as green mussels are one of the fastest growing bivalves which take five to six months and oysters takes about eight months to reach their market size. The materials required for culture are minimal and

Training on construction of rens by the 'Prasidhi SHG'

Training on construction of rens by the 'Prerana SHG'

sourced locally. The local market is good especially in Kerala, Karnataka, Goa and Maharashtra.

In consultation with the Sindhudurg district administration, a master plan was created to transfer the technology to potential beneficiaries. The entire farming operation, *viz.*, starting from seed collection to marketing, was done by the women themselves. In succeeding years the farming activities were intensified by the involvement of more groups. Now, oyster farming is a part-time vocation of the coastal fisherfolk in the Sindhudurg coastal belts.

Bivalve farming is constrained due to the lack of adequate seeds, quality of seeds and issues of environmental over-capacity in the main farming area. As the present study dealt with the documentation of a descriptive case study from the gender perspective in oyster farming SHGs, focusing on the gender equity and equality, there is ample scope to explore the gender empowerment paradigm along with emphasis on the three pillars such as economic empowerment, well- being and decision making. Being an important stakeholder of fisheries sector, women shoulder various roles.

Despite the economic and socio cultural significance of fishing in Maharashtra State, the women fisher folk at large are excluded from the mainstream of the society in the economically disadvantaged category without accruing the benefits from the fishing industry (Kurien, 1994). Traditionally, fisher women are important stakeholders in fish processing and marketing. With an increase in the awareness level among women on the economic activities and dissemination of aquaculture techniques, rural women from other castes have joined the fishery sector. Women constitute about half of the total population and comprise one-third of the labour force. Although, it is largely accepted that the role of women in fisheries sector is limited to processing and marketing, then, their role in activity like aquaculture cannot be ignored. On the other hand, their participation in this sector should be strengthened for better production.

Like any other sector of agriculture, women participation in aquaculture remains largely unnoticed. Women are rarely considered a target group for the adoption of new technology. Because women constitute half of the total population, negligence in brining to them to the forefront of action gives a negative signal to the total development process. It is estimated that women carry out almost 70% of agricultural workload, but in aquaculture, their role has not been properly identified. Women's role in fisheries is very significant and there is gender bias with respect to their work. This discrimination may be noted from the country's scenario through the economic upliftment of fisherwomen through appropriate policies, programs and projects. Women are the important stakeholders of our development process. The extension system hardly targets women folk for technological empowerment. Though the participation of women in fishery sector is age old, they

are still engaged in traditional methods of processing and marketing. Their participation in the culture sector is not properly defined as yet. Aquaculture is a developing sector and women participation in this sector needs meticulous planning for technological empowerment while addressing social and economic barriers. On-farm trials conducted by DRWA, CIFA, CIBA and CMFRI have revealed the strong motivation and capability of women for taking up aquaculture (freshwater, brackish water and marine). Empowering women in different aquaculture practices (freshwater and brackish water) can provide a suitable option for sustained economic and nutritional security of the family and thereby an in-depth observation on these dimensions made through the present study has ample scope to explore the paradigm of gender balance and women empowerment based on the views of 'Women in Development' (WID) and 'Gender and Development' (GAD).

Judicious utilization of common property resources for sustainable development without endangering the environment is possible through community participation. The development and empowerment of weaker sections and gender mainstreaming in the Indian fisheries sector in a broader visualization will be materialized to a great extent with the help of poverty eradication programs through transparent media, particularly the SHG's which can play a vital role for the development of fisheries sector. The requisite of the participation of fishing community, especially women, in the planning and implementation of various coastal sector development program is therefore of utmost importance.

Materials and Methods:

The data gathering protocols on gender mainstreaming were standardized. Major variables and dimensions to be quantified during data collection were shortlisted with expert consultation. Local enumerators were trained for data collection in the potential pockets where the mariculture technologies were being disseminated. Similarly the secondary data collection also contributed a vital role. Surveys were conducted at Malwan, Sindhudurg on the 1st March 2015.

Data was collected on socio-economic and behavioural aspects from fisher folk respondents among the different types of identified stakeholders under primary, secondary and tertiary sectors in the study locations of the mariculture technology. The information was essentially gathered through secondary data collection and triangulation was done in consultation with major sources of information such as the fishermen co-operative societies and SHG's of fisher folk using the survey staff of the Fishery Resource Assessment Division of ICAR-CMFRI and marine fisheries census reports of ICAR-CMFRI. Data was also gathered on demographic characteristics and elucidated specific case studies of women in mariculture sector. A review of the existing livelihood methods of women fisherfolk, mobilized as SHG's in the selected mariculture locations was also undertaken in the present study. The dependent variables like Group Dynamics Effectiveness of SHGs were measured by developing appropriate indices like the GDEI and other arbitrary scales for the assessment of gender perspectives like participation profile, constraint analysis, were standardized. The assessment of Group Dynamics Effectiveness of SHG's was done with a standardized protocol developed with twelve identified sub-dimensions, namely, Participation, Influence and Styles of Influence, Decision Making Procedures, Task Functions, Maintenance Functions, Group Atmosphere, Membership, Feelings, Norms, Empathy, Interpersonal Trust and Achievements of SHG.

The practical awareness and capacity building programs, including the training on oyster farming, were conducted at Wadatar for the benefit of the selected SHG. Technical training was given by the ICAR-CMFRI officials. The SHG's engaged in Oyster farming are Aprekar Swayam Mahila Bachatgat, Chavdekar Swayam Sahayatha Bachatgat, Prasidhi Bachatgat and Jay Bhagrang Swayam Sahayatha.

Under the UNDP-GEF project, training of the SHG's in Wadatar area for bivalve farming was conducted on the 16th October, 2015 for which two racks were assembled. On 9th of December, 2015 training in bivalve farming was given at Taramumbari and on 10th December training was organized at Vengurla and on 11th December the venue was at Devbaug near Malvan. In all the training centers, the fishermen were given hands-on training in making the oyster ren as cultch material and rack making were demonstrated.

By October 2015, the participants were given training on various aspects of oyster and mussel farming followed by practical training on rack and ren construction. A manual on bivalve farming in Marathi was published as the project output and distributed to all the participants. Four SHG's have been identified across the proposed sites by scholars and the staff at Sindhudurg.

Results:

Localities identified for bivalve farming through various visits were Devbhag, Taramumbri, Wadatar and Vengurla in the Sindhudurg district. Detailed discussions

with the bivalve fisher folk of the four identified areas of Sindhudurg were held. SHGs were mobilized in 2014 and CMFRI set up a demo oyster farm in Wadatar, in Sindhudurg District under the UNDP/GEF funded project "Demonstration of bivalve farming at Sindhudurg District in the state of Maharashtra". Training was imparted along with demonstration of oyster farming to the SHG, *"Prasidhi",* which consisted of 10 members. About five hundred strings containing 7,000 oysters were harvested. Each string consists of 10-15 live oysters. The recorded meat content was high at 11-12%. Live oysters were sold at the rate of Rs. 150-200 per dozen. The overall cost of production was estimated as Rs. 18,000-20,000. About 50% of the total production were sold as live oyster and a total revenue of Rs. 50,000 was obtained from live oyster sale alone, apart from the revenue earned by the of selling the meat of small oysters, which contributed around Rs.15,000. Therefore, the total revenue is calculated as Rs 65,000 with a profit of Rs.45,000. This success case can be used as a case manual for group action on a sustainable basis for bivalve farming technology.

The results of the yield and GDEI scores obtained for each SHG are presented in the Table below. The highest score on GDEI and C:B Ratio was obtained by Prasidhi SHG, which indicates a significantly positive correlation between BC Ratio and GDEI as achievements in terms of the yield is the most important dimension of GDEI.

Sl.No	Self Help Groups	C:B Ratio	Group Dynamics Effectiveness Index (GDEI)
1	Aprekar Swayam Mahila Bachatgat Devgad, Sindhudurg	1:3	0.85
2	Chavdekar Swayam Sahayatha Bachatgat, Devgad, Sindhudurg	1:2.9	0.84
3	Prasidhi Bachatgat Devgad , Sindhudurg	1:3.5	0.89
4	Prerana Swayam Sahayatha, Devgad , Sindhudurg	1:3	0.85
5	Jay Bhagrang Swayam Sahayatha Devgad, Sindhudurg	1:2.8	0.84

(C:B – Cost:Benefit; B:C-Benefit:Cost)

Discussion:

For a group to be developed as a SHG, it has to pass through various phases such as Formation phase, Stabilization phase and Self Helping phase. A SHG consists of members that are linked by a common bond, like caste, sub-caste, community, place of origin, activity etc. In an intensive study of Group Dynamics, Pfeiffer and Jones (1972) identified the factors of group dynamics and how the group is organized, the manner in which the group is led, the amount of training with regards to membership and leadership skills, the tasks given to the groups, its prior history of success or failure, etc. In a detailed study on group dynamics, Hersey and Blanchard (1995) gave emphasis on helping and hindering roles played by individuals such as establishment, dedication, dependence, attendance and avoidance along with aggressive, persuasive and manipulative behavior.

The SHG's promote a cooperative and participative culture among the members, which ensures the empowerment culture of the Self Helping phase. The loan sanctioning, utilization, accounts maintenance and timely repayment of loans, etc. are systematically accomplished with proper maintenance of the records by the group members. This ascertains the fulfillment of norms and standards of the SHG leading to economic empowerment of the members. The major expenditure required for bivalve farming is for labour and materials such as bamboo, nylon rope, coir, cloth, seed, etc. The labour costs essentially include construction, seeding, harvesting, etc. The BC Ratio of SHG's was found to be substantially good which proves the profitability of mussel farming in the first crop itself, whereas, in the subsequent years, material costs such as those of bamboo, rope, cloth and labour cost in construction, etc. are negligible, which ensures reasonable profit and adoption of mussel farming enterprise bringing about economic empowerment of rural women through organized Self Help Groups.

This successful case study in Sindhudurg essentially focused on the major objective of assessing the group dynamics of the SHG's of women fisher folk and identifying the important dimensions contributing to their effectiveness and assessing the influence of personal and socio-psychological characteristics on group dynamics. The project stressed on the popularization of and evaluation of molluscan culture technologies in the coastal

belts of potential maritime locations in Sindhudurg coast in consultation with NGO's and the State Government Departments mobilized SHG's. Whether The SHGs', are a temporary phenomenon, or would they continue on a sustainable basis, needs to be analyzed and probed. (Fernandez, 1995). The constraints have to be addressed, and empowerment should be brought about by adopting suitable economically viable micro enterprises in the fisheries and allied sectors by strengthening of these SHG's (Vipinkumar *et al*, 2013).

Bivalves being filter feeders need to be depurated before marketing as they may accumulate contaminants in higher levels than the ambient waters. The main function of depuration is the elimination of the microbial contaminants. By providing the ideal physiological conditions to the filter feeders to perform filtration activity with continuous flow of water ensures elimination of the depurated matter. A common depuration plant for the bivalve growers would help in getting value addition to the product. Organized fishermen's cooperatives can play a vital role in various stages of seeding, harvesting, sorting, grading, packing and marketing with an intention of export potential. As mussel seed availability is a major constraint, a bivalve hatchery unit in the coastal area would be a great boon in furthering bivalve farming in the region.

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