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1061 Oyster Farming- a rural development programme in Kerala

Oysters form an important component of the inter-tidal biota of Indian coast. Traditionally oyster fishing has been at a subsistence level, catering to a restricted domestic market. The oyster culture technology developed by CMFRI in the 1970's could not be commercialized for two decades mainly due to the low consumer demand for oysters. Apart from this, shrimp and finfish farming are the traditional aquaculture practices in the coastal areas and all modernization and scientific interventions have been made mainly on these two farming systems.

In 1993, CMFRI initiated a location testing programme for bivalve farming as a prelude to transfer already developed technologies to the farmers of the coastal villages. The objectives of this project were field testing of oyster culture technology, modification of technology (if necessary), to collect economic data and to create awareness among the end-users about the benefits of oyster culture. Accordingly, hatchery produced oyster spat of CMFRI at Tuticorin were transported to Kerala and stocked in different estuaries. Among the various sites tested, best results were obtained in Ashtamudi Lake in Kollam district. Through continuous interaction with the farmers and other developmental agencies and through demonstrations, it was possible to convince the rural fishers about the techno-economic viability of oyster farming in the southern and central part of Kerala. Now this technology is adopted by more than 250 farmers in estuarine areas of Alleppey and Kollam districts of Kerala covering 2.2 ha. The total production during 2002 was estimated as 350 tonnes shell-on, yielding 28,000 kg meat, worth Rs. 12,60,000. An appraisal of the progress of oyster farming in Kerala is given below

Fig. 1 Oyster farms (racks) in Kayamkulam Lake in Kerala

Development of oyster farming in Kerala.

Based on the intense settlement of oyster spat in the experimental oyster farms at Ashtamudi in 1993-94 farm trials were intensified and 800 rens were stocked in the rack in 1995. The successful harvest of oysters (*Crassostrea madrasensis*) from the farm was witnessed by local fishers and administrators. This lead to the establishment of private oyster farms (Fig.1.) in the succeeding year. Though the number of farms were limited to six initially, farming activities by these farmers and their success kindled an instinct in the other fishers of the area to start oyster farming . The CMFRI convinced the state officials about the feasibility of oyster farming in the state and consequently, the Brackish water Fish Farmers Developmental Agency (BFFDA) included this particular aquaculture activity as a viable scheme for rural development. From 1999 - 2000 onwards the funding programme was intensified by the state goverment. Supported by the finance provided by BFFDA, several fishers in the vicinity of Ashtamudi Lake set up their own oyster farms and this was reflected in the increase in farmed oyster production . Another organization which has helped in the development of oyster farming in the state was

the Integrated Fisheries Project (IFP), Cochin. The entire oyster stock was purchased by IFP and the farmers were able to continue the farming activity.

Role of government organizations viz. BFFDA, MATSYAFED, IFP, CMFRI and NABARD in oyster farming.

The BFFDA, Kollam regularly organizes oyster farming training programmes in the villages around Ashtamudi and Kayamkulam Lakes in Kerala. The programmes are arranged by the BFFDA and the officials of CMFRI conduct theory and practical sessions on the various steps involved in oyster farming. Simultaneously the officials of CMFRI visit the areas where the farms are proposed to be set up and assess the suitability of the site for oyster farming. BFFDA provides financial assistance at the rate of Rs.1500 per farmer for setting up a farm of 500 rens. About 5 to 6 members of a Self Help Group avail this amount and utilize it to set up a big farm. This is reflected in the increase in farmed production of oysters from 2000 onwards. Since 2002, BFFDA has also helped the farmers to sell the oyster meat through Integrated Fisheries Project, Cochin and MATSYAFED.

The IFP at Cochin has helped in marketing the oysters produced by the farmers. At the time of harvest, the officials of IFP visit the site and collect the heat shucked oyster meat from the farmers. The meat is further canned as smoked oysters or oysters in brine and sold in the metropolitan cities. Sometimes the frozen meat is sold locally. The farmers get the advantage of selling the entire produce as a single lot at their own farm site.

MATSYAFED has helped in marketing the produce during the last season. Widening of the oyster market is an added gain. The National Bank for Agriculture and Rural Development (NABARD) initially helped in the preparation of bankable schemes based on the CMFRI technology.

In addition to serving as resource persons in the training programme organized by other developmental agencies, the CMFRI independently conducts training programme to the planners, farmers and officials of developmental agencies. They help the BFFDA officials to select the site suitable for oyster farming and help the farmers to set up the farms, in identifying the time to place the spat collectors, time of harvest based on condition index and provide scientific guidelines to maintain the quality of the oyster meat during post harvest processes. Initially CMFRI has also helped in the sale of the produce by transporting the iced oyster meat to Cochin city for distribution and sale through supermarkets and cold storage.

Status of oyster farmers of Kerala

In Kerala, oyster farming is now a household activity where all the family members are mobilized to participate in different activities. A survey was conducted during 2000-2001 in the coastal villages of Kollam and Kayamkulam to understand the socio-economic status of the farmers and their perception about oyster farming. Ninty oyster farmers were interviewed. The inferences made from this indicated that 50 % of the oyster farmers were in the age group 30-40 years, 24% were above 50 years, 20% between 20-30 years and 7 % between 40-50 years. Occasionally children help their parents in ren making. In Ashtamudi Lake, 95 % of the families involved in oyster farming earned their livelihood through clam fishing. The basic occupation of the oyster farmers in Kayamkulam is fishing. The women through activities related to agriculture and fisheries earn additional income for the family. 48% of oyster farmers had attended primary school, while 44 % had completed high school and 8% of oyster farmers were either undergraduates or

graduates. Retired school teachers were also active participants of the Women Self Help Groups. The survey also indicated that the main beneficiaries of oyster culture were women.

Role of women in oyster farming

In the coastal villages of Kerala, women play an important role in income generation for the family. The employment opportunities open to them are fish marketing, shrimp peeling, fish processing, ownership of small stores etc. As indicated by the survey, participation of women in oyster farming is high . In oyster farming there are five major activities such as ren making, rack construction, harvesting, post harvest processing and marketing. The socio-economic survey conducted among the oyster farmers showed that though women were involved in all these activities their participation is more in ren making (boring and stringing the empty oyster shells and suspending) and post harvest processing such as cleaning, shucking and packing. Farm construction and harvesting are usually done by the male members . Marketing in some locations (Kayamkulam Lake) was done exclusively by women. The level of participation by women in the various activities is given in Table. 1.

Table.1. Gender wise level of participation (in percentage) in various activities related to oyster farming in Kerala

Activity	Women and children	Men
Ren making	92	8
Rack construction	6	94
Harvesting and cleaning of ren	13	87
Meat shucking	82	18
Packing of meat	95	5

What is a Self Help Group (SHG)

This scheme was introduced by Government of India with an objective to improve the economic / living standard of the villagers by providing them financial assistance at low interest rates to implement small scale income generating activities. This was also intended to inculcate saving habits among the villagers. The important features of the SHG is given below

- The groups are formed by people living in the same village and with almost similar financial level, usually low income group.
- Each group will have a President, secretary, treasurer and two executive members. These members cannot hold the position for more than two consecutive years. The total membership should be less than 20, small groups of 10 to 15 members have been found to be better
- SHGs usually undertake group activities utilizing the resources available within the village or nearby localities.
- The finance of the group is handled through a bank under the joint account of two members of the office body. The group becomes eligible for getting a loan from the bank after six months of its formation. A credit plan has to be prepared and submitted to the bank.

Each member will be assigned specific duties and responsibilities. The freedom to decide the objectives, prepare and implement the work plan is within the group itself. The amount of money to be deposited by each member, the amount and interest rate for the loans availed by the members from the savings of group are decided by the members themselves. The savings earned by members through different income generating programme (like animal husbandry, catering, etc) will be pooled and this amount is made

available for the members for meeting their emergency needs. Each group will convene a weekly meeting of the members and keep record of the funds utilized and generated, discuss the progress of their activities and make necessary improvements as and when required. This serves to empower the women and make them capable of taking decisions. The financial security also instills confidence among the villagers and provides overall development of the society/village.

Women Self Help Groups in Oyster Farming. In Kerala, oyster farming is done mainly by the women SHGs. These are called "Sthree sakthee" (meaning women power). The salient features of these groups are given below.

- Each group consists of 8 to 12 members.
- The members participate in the oyster culture training programmes organized by BFFDA or CMFRI
- The president, treasurer and secretary usually have good liaison with BFFDA and they do the needful to get the finance in time.
- Loan is availed by 5 to 6 members in a group from the BFFDA and utilized for farming.
- All the members clean the shells and prepare the rens for spat collection.
- During harvest, the members actively participate in the post harvest processes.

Oyster Production in Farms

Most of the oyster farms (rack) are constructed depending on the topography of the site. The production per farm depends on the number of rens, number of spat per ren and growth of the oysters. Details regarding these are given in Table.2.

Table.2. Details of oyster farms in Kerala

Location of the farm	Kayakulam and Ashtamudi Lakes in Kerala,India
Number of farms	Kayakulam : 30 Ashtamudi : 20
Annual production	350 tonnes shell
Season of farming	October to June (sometimes in Ashtamudi Lake it extends upto September since the salinity does not fall below 10 ppt during the south west monsoon period (June to September)
Seed collection method	By placing rens prepared from shells collected locally, 4 to 5 shells per ren. Length of ren = 1 to 1.5 m
Spat collection period	November to February with a peak in December
Spat fall intensity	3 to 10 per shell in Kayamkulam 3 to 25 per shell in Ashtamudi
Size of the oyster farm	5x4m, 6x3m, 6x4m, depending on the area of the site. Depth 1.5 to 2 m
Number of rens per farm	Average 1500
Farm structure	Farm made of casurina / bamboo poles purchased locally
Ownership of farms	• Women Self Help Groups • Family owned
Farm particulars	One unit 6 x 4m (3 nos) constructed by utilizing the amount given for 3 members i.e. Rs.1500 x 3 = Rs.4500 No.of rens 500 x 3 = 1500

Production per ren	Average 5 kg/ren Total production per farm = 5 kg x 1500 rens= 7500 kg. Heat shucked meat weight = 8 % of 7500 = 600 kg. Amount (Rs) from the sale of 600 kg of meat @ Rs.60/kg of shucked meat = 600 x 60 = Rs. 36,000 per farm
Income from farm per family /unit	Rs. 6000 to Rs.12,000 depending on the stocking in the farm

Evaluation of the oyster farming adoption in Kerala

The success in commercialization of oyster culture in Kerala clearly indicated four major factors which have helped in popularizing this farming activity. They are:

1) Setting up of demonstration farms with farmer's participation. This helped to create awareness among farmers.

2) Training to farmers and continuous interaction with the target groups gave more confidence to the farmers.

3) Timely financial support to oyster farmers from government agencies

4) Support in marketing the produce through government agencies

The actual impact could be made only through demonstration farms set up by the Institute in different parts. The term "farm" in the Indian context is an earthern impoundment where shrimp and fish are farmed. An entirely new concept of farm - the "simple wooden racks" constructed for growing oysters was introduced among the villagers by involving them in the demonstration programmes. Later these fishers extended their expertise to new oyster farmers in the village.

Two decades since the development of oyster culture technology by the CMFRI, the first commercial oyster farm was set up in a coastal village of Kerala. The first oyster farmer, Mr. Vincent Mukkadan was also the recipient of the best farmer award constituted by the State during the year 1998. In the programmes on oyster culture in Kerala participation of villagers was given top priority. Their involvement in farm construction, ren making and harvesting succeed in developing an urge to own an oyster farm in the villages.

Supported by the financial assistance and marketing assistance by developmental agencies, the state is poised to double its production of oysters in the coming years. Oyster farming on a commercial scale is possible only through an integrated approach by the research organizations, state fisheries departments and village governing bodies and through this developmental programme overall rural development is possible (Fig.2).

Future prospects

The maritime states along the west coast especially Karnataka, Goa and Maharashtra have extensive estuarine systems which become conducive for oyster farming during the post and pre monsoon period. An added advantage for these states is that the oysters in the natural beds are fished and the meat is utilized in the restaurants and also for household consumption. It is possible to develop oyster farming as a rural development project in these states also.

At the national level the current level of beneficiaries are minimal. The adoption rate becomes fast when it is market driven. Since oyster markets (both internal and external) have not widened, the farmers hesitate to come forward on their own to start oyster farming. Currently the oysters produced by the farmers are marketed in the state itself. However, there is wide scope for expanding the market within the country

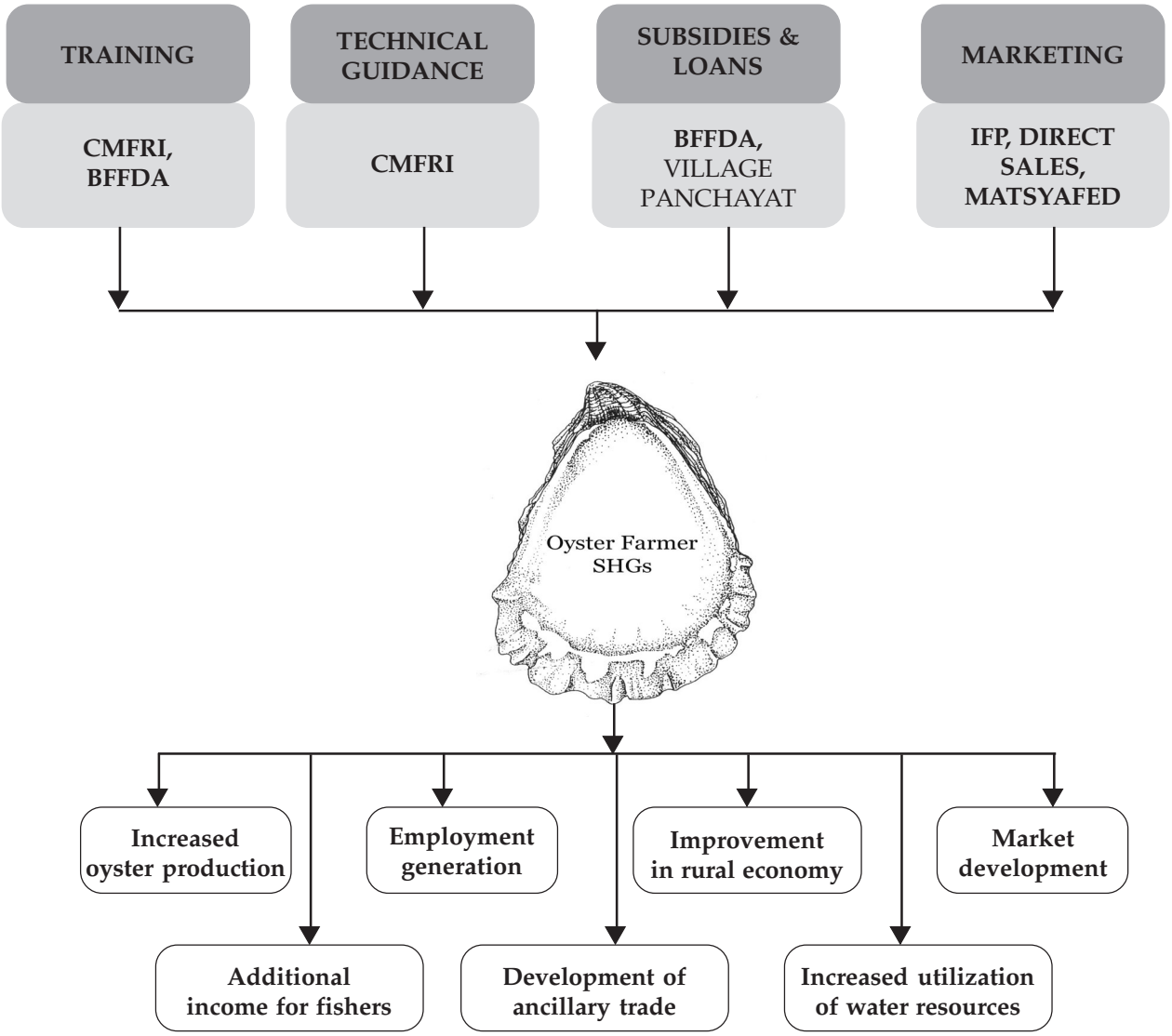

Fig.2. The supportive inputs for oyster farmers and impact of oyster farming on coastal villages

itself. Oysters form a gourmet food in the temperate countries and taking advantage of this the live oyster market can be developed to meet the demands of tourists. The live oyster trade can be expanded by setting up farms in clean unpolluted areas capable of producing single oysters which can be marketed by linking it with tourism. In addition to this oyster farming can also be integrated with shrimp culture. Oysters being filter feeders would help to control the frequent phytoplankton blooms in the ponds.

The success achieved in India clearly indicates that the involvement of the state officials and village governing bodies can catalyze the process of technology adoption. With good, unpolluted water resources other developing nations also can plan oyster farming programmes for rural development with the involvement of women.

Prepared by : **V.Kripa, K.K.Appukuttan, T.S.Velayudhan, K.S.Mohamed, P.S.Alloycious, P.Radhakrishnan, M. Joseph and J.Sharma, C.M.F.R.I., Cochin - 682 018**