TRANSFER OF CRAB FARMING TECHNOLOGY IN COASTAL VILLAGES OF KERALA - AN INTEGRATED APPROACH

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Abstract

Aqua - business is emerging as an important livelihood option for the coastal fisher folk. Among diversified technological options crab farming provides immense opportunity as an alternative for the declining shrimp aquaculture in disease prone regions. Further it enables the utilization of the under utilized water bodies for better aqua productivity. Crab farming has been transferred to 40 fisherfolk in two coastal villages of Kerala by setting up demonstration farms and imparting training. This study shows that crab farming is highly profitable for small and marginal farmers. The major constraint for wider adoption and propagation is lack of hatchery produced seeds.

INTRODUCTION

In India, crabs form as a by catch of indigenous and mechanised fishing units to capture fishes from the inshore waters. The average annual crab landings from the marine sector in India during 1999-2000 accounts to 48,384 tonnes and the crab landings in Kerala alone during this period was about 15,150 tonnes. (Anon 2000). The export of crabs from India during 1996 was only about 3,880 tonnes. The exports increased continuously and in 2000 it was around 6,197 tonnes valued at Rs. 93.31 crores. (MPEDA 2000). The importing countries were mainly Malaysia, Korea, Singapore and Thailand. Commercial scale crab farming is widely practiced in many East-Asian countries like Taiwan, Indonesia, Phillipines and Malaysia. In India crab farming is yet to take off due to many techno-socio-economic constraints. The

ever increasing demand coupled with lucrative price both in the domestic and international markets for crabs induce many of our enterprising fisherfolk to shift their attention towards crab culture in recent years.

Crabs belonging to the genus *Scylla* of the family *Portunidae* are commonly known as mud crabs or green crabs or mangrove crabs. These crabs occur commonly in the shallow coastal waters, brackish water lakes, estuaries, swamps and mangroves. The relishable delicacy of the crab meat coupled with its therapeutic value commands higher demand among the marine products export from our country.

Kerala state has vast potential for aquaculture as it is gifted with a wider area of brackish water which favours the culture of marine organisms. The total brackish water available in Kerala is nearly 2.42 lakh hectares and from among this an area of 65, 000 ha was found suitable for shrimp culture. Since the shrimp culture in recent years is facing the disease threat, farmers are trying for alternatives which may help them to enhance their earnings with less risk. In this juncture, crab farming appears to be the next best alternatives for the farmers. So in order to enhance the adoption of crab culture by the farmers, efforts need to be put forth to propagate this technology among the farmers in the coastal villages.

INTEGRATED EXTENSION APPROACH IN TRANSFERRING CRAB FARMING TECHNOLOGY

An integrated extension approach involving the research system (knowledge generation system), the extension system (knowledge dissemination system) and the farmer system (clientele system) was applied in the transfer of crab farming technology. In any integrated approach emphasis should be on the operational mechanism of the organizations involved in the net work. Effective linkage and coordination within the development departments are the crucial factors for effective quality extension work and transfer of technology programmes.

The principle aim of transfer of technology programmes in fisheries extension is to increase productivity through transfer of appropriate technologies. It also includes ensuring input supply and information services, training of farmers for knowledge and skill upgradation to cope-up with technological advancements, marketing and management. For any development programmes to witness success, it is of paramount importance that scientists, extension workers and farmers work together as a team. (Samantha 1999). Participatory approach for technology development and technology dissemination plays a crucial role in the extension management system.

Research Methodology

Selection of villages

Chellanam and Panambukadu villages were selected from the Ernakulam district of Kerala state. Chellanam is having both open access marine fisheries and brackish water fisheries. Panambukaddu forms part of Mulavucaud island surrounded by brack waters. Both these villages offer immense scope for the development of aquaculture. The Chellanam village has a total area of 19.37 Sq km with a total population of 38,647 people. The major occupation of 80 per cent of the people is mainly fishing and the rest are involved in other jobs. The Mulavucaud panchayat has a total area of 10 Sq km and the population of this village is 22,525. Nearly 50 to 60 per cent of the people in this village are involved in fishing and fishery related activities. These two villages were purposively selected as they offer wider potential for aquaculture activities and the ponds spread in this area are quite suitable for crab culture.

Selection of beneficiaries

Detailed survey was conducted in Chellanam and Panampukadu villages and based on the pilot survey, a total of 40 fisherwomen families (30 farmers from Panambukadu and 10 farmers from Chellanam) having a pond area ranging from 5 to 10 cents were selected for transferring the crab farming technology. Each selected farmer was given a financial support of Rs. 10,000 for taking up culture activities and the amount was distributed for earmarked activities such as pond preparation, sluice maintenance, seed stocking, feed and harvesting. The financial assistance of Rs. 4,00,000 was given by the Ernakulam district administration under the special component plan.

Results and Discussions

Socioeconomic characteristics

To elucidate the feasibility of the integrated approach a field level venture was done and the results discussed. The general profile of the beneficiaries is presented in Table 1.

It is evident from Table I that nearly 45 per cent of the farmers belonged to young age group and 90 per cent of the farmers are literates. Nearly 35 per cent of the farmers had education upto primary and (30%) upto secondary level of education. Sixty seven per cent of the farmers are living in tiled houses. More than 50 per cent of the farmers had medium level of extension agency contact and mass media exposure.

Table 1
General profile of the beneficiaries

n=40

		No.	*Percentage*
1	**Age**		
	Young (< 35)	18	45.00
	Middle (36-50)	12	30.00
	Old (> 51)	10	25.00
2	**Education**		
	Illiterate	4	10
	Primary	14	35
	Secondary	12	30
	High school	8	20
	Collegiate	2	5
3	**Type of house**		
	Thatched	7	17.50
	Tiled	27	67.50
	Concrete	6	15.00
4	**Annual income**		
	< Rs. 5000	12	30.00
	Rs. 5000 - 10000	18	45.00
	Rs. 10000 - 15000	6	15.00
	> Rs. 15000	4	10.00
5	**Occupation**		
	Fishing alone	8	20.00
	Farming alone	22	55.00
	Fishing and farming	4	10.00
	Fishing and farm labour	6	15.00
6	**Extension agency contact**		
	Low	9	22.50
	Medium	21	52.50
	High	10	25.00
7	**Mass media exposure**		
	Low	7	17.50
	Medium	21	52.50
	High	11	27.50

Any programme implemented need to be compatible to the existing farming system and it should pave way for better utilisation and integration of available resources. The technologies identified for implementation should be location specific and also support the local needs. Blanket application of extension strategies/approaches in all the regions cannot provide effective or efficient services for better productivity, production and income. As a maiden attempt to transfer the technology of crab farming among the coastal fish farmers, model farms were set up in these two villages.

Setting up of model farms

The farmers identified under the programme were imparted training on different aspects of crab farming starting from pond preparation to harvesting. On gaining knowledge about the faming they have undertaken the crab farming in their own farms under the guidance of experts. Pond preparation such as *bund* construction, cleaning and deepening of ponds were done by using the family labours. The ponds were provided with slanting net fences so as to prevent the escape of crabs. The ponds were also provided with inlets and outlets for water exchange. Water intake was based on the tidal influx.

The farmers were provided with crab seeds collected from the wild by private parties. The seeds were stocked at the rate of 3 to 4 per sq. meter. On an average 140 crabs (weighing 200 to 250g) were stocked in each pond. The crabs were fed with the meat of bivalve and trash fish at the rate of 5 to 10% of body weight approximately. For maintenance of water quality, exchange of water was done frequently. The major water quality parameters such as temperature, salinity and pH were monitored regularly. The crab attained a marketable size of 500 to 900g in a period of 5 months.

Harvest/ production

After the attainment of marketable size, crabs were harvested using scoop nets. Hooks were used to retrieve the crabs from their burrows. An estimated yield of about 100 kg was achieved. The harvested crabs in live condition were locally sold by the farmers.

The comparative growth rates of crabs in the two villages were observed and presented in Table 2.

The crabs with an initial weight of 200 to 250g were stocked and they attained a weight of 750 to 870g after nearly 140 days. On an average the farmers harvested around 100 kg from 10 to 20 cents of pond area in both the villages. No marked difference in growth rate was observed in both the places. The gross income realised ranged from Rs. 15,000 to Rs. 25,000.

Table 2
Comparative growth rate of crabs in both the villages

Period (Days)	*Weight (g)*	
	Chellanam	*Panambukadu*
At the time of stocking	200-250	200-225
30	320-395	320-410
60	450-490	450-500
90	550-620	520-610
120	600-760	620-730
140	650-870	750-910

All the farmers (100%) reported that less availability of seed, non availability of formulated feed and stocking of uniform sized crabs as the major problems. This may be due to the fact that as such no commercial hatcheries are available in India to produce seeds. Mostly the farmers are giving trash fishes as feed and there is no formulated feed readily available as in the case of shrimp feed. Since the seeds are collected from the wild, it is very difficult to get uniform sized seeds. The other problems reported are escapism of crab (80%) and lack of financial support (40%). Even though netting is done around the field, any damage in the netting will act as a way for the crab to crawl out. The farmers are not able to get adequate loans from credit agencies to take up the culture activities. The details are given in Table 3.

Table 3
Constraints reported by farmers in adopting crab farming

n=40

Constraints	*No*	*Percentage*
Land leasing	12	30
No proper water exchange	8	20
Less availability of seed	40	100
Lack of financial support	20	40
Escapism of crabs	32	80
No formulated feed available in market	40	100
Stocking of uniform sized seeds	40	100

Conclusion

Crab farming is emerging as an alternate avocation for shrimp farming because of its high export demand and increased income. It could also be thought of as an enterprise in the shrimp farming areas because crab is a hardy species which is less susceptible to diseases. The hi-tech shrimp oriented aquaculture development in our country has not only enhanced productivity and earnings but also led to the problems of environment, disease outbreak and socio-economic conflicts. Rotation of crops is one of the best options suggested by experts to counteract the disease problems and crab culture is the ideal alternative to optimise the utilisation of our potential yield, earnings and employment.

The on farm demonstrations conducted have created an awareness about the crab farming technology and these have made the other farmers also to take-up this technology in their fields. This programme helped the farmers to derive supplementary income. Pond areas, which were unutilised/ underutilised, were put into use. Since the foremost requirement is the availability of seeds, efforts should be put forth by the researchers to develop hatcheries for producing seeds. Linking the fishermen to the credit agencies to avail financial supports may enhance the adoption level. For massive propagation of this technology more and more of this type of demonstrations should be conducted in different villages.

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