

MANAGEMENT STRATEGY FOR SHRIMP (*PENAEUS MONODON*, FABRICIUS) FARMING AT BHAGBANPUR REGION IN PURBA MEDINIPUR DISTRICT OF WEST BENGAL, INDIA

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ABSTRACT: Shrimp culture can give miracles towards socio-economic development for a large number of rural people. Its sustainable development can be achieved through the application of scientific methodology, input of technical knowledge at the crisis time, quality control mechanism targeted to marketing strategy, sufficient supply of institutional credit and Government involvement in the marketing strategy. An optimum output cannot be assured even after taking the risk of huge investment. The export policy promotion and distinct quality measures are the major thrust area for the recent days. Government efforts in implementing a proper planning and management oriented marketing strategies are required for the sustainability of the industry.

Key words: Shrimp, Export policy, Quality measures, Training, Sustainable development.

INTRODUCTION

Shrimp culture now represents the largest component of global aquaculture in terms of market value and among all kinds of aquaculture practices, shrimp aquaculture predominates all over the tropical and subtropical countries and shrimp culture is the world's most rapidly expanding warm water aquaculture sector (Phillips *et al.* 1993). West Bengal is considered with the largest impounded brackish water area in the country covering around 2,10,000 ha besides the coastline of 158 Km, spreading over

3 districts namely Purba Medinipur, North 24 Parganas, South 24 Parganas where traditional farming for tiger shrimp (*P. monodon*) is practiced. These systems are called (Bheri) or (Bhasabandh) system (FAO Fis. Stat. 1992).

Till date, though production level is high, there is a major dependence on export market where the key is on the other side, which totally controls the fate of the industry. In the surveyed block more or less 50,000 people directly and indirectly depend upon the industry.

With proper water management, selective

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stocking of quality shrimps seeds, use of pelletized feed and artificial aeration system, such farms are capable of producing 1-1.5 ton / ha / crop (FAO Fis. Stat. 1992). This type of extensive system and semi-intensive farming systems are mainly done in Purba Medinipur district, West Bengal which has 5618.22 ha of culturable brackish water area, among which 3,342 ha of potential areas are suitable for shrimp farming (Upadhyaya 2001). This study try to evaluate present status of shrimp industry, farm management practices adopted by the farmers, the constraints faced by them and to develop the better management practices.

MATERIALS AND METHODS

Selection of site :

The present study was carried out to evaluate the present status and problems of shrimp (*P. monodon*) culture practices going on and around the coastal belt of Purba Medinipur district particularly in Bhagbanpur-II block in West Bengal, India during June to September 2012. A random sampling of ten villages (*viz.* Baghandari, Ektarpur, Kantapukuria, Brindabanchak, Arjunnagar, Madhakhali, Jararnagar, Bamunia, Burir Dokan and Ramchak) and from each village five farmers *i.e.* in total 50 nos of shrimp farmers were interviewed to fulfill the purpose.

Data collection :

Data collection were made by two ways; collection of existing data (secondary data) such as published literature, books, research articles and maps etc. of institutions. The present status, current problems and related legislation were collected from the literature survey. The collection of new data by filling of questionnaires was carried out. The collected

data are later analyzed statistically.

RESULTS AND DISCUSSION

The main reason for adopting shrimp farming is for its huge return within a very short period of time. There is a huge risk in culturing and marketing the *P. monodon*, still they are practicing this system for the above reason. 73% of the farmers adopted shrimp farming as their major source of income, while 19% of them adopted this as their side income followed by 8% with agriculture and horticulture. Among all the surveyed 50 farmers, 33% constructed their farms in their own land and rest 67% farmers constructed farm either in leased land or in their relative's land.

Farm management :

Most of the farms under study are situated near Kalinagar Canal and its branches known as Suti Khal in the local name. Majority of farms are of small sizes (65%) ranging from 0.1 ha to 0.3 ha. 23% of the farms are less than 0.3 acre. 12% of the farm surveyed had water spread area more than 2 acre. It was observed that 61% of the farms had 1-2 ponds, 29% with 3-4 ponds and 10% more than 4 ponds.

During survey it was found that 18% of the ponds are 7-8 years old, 33% are 4-7 years, 32% are 2-4 years and 6% are 1-2 years of age. 11% are new ponds. 32% farms have single inlet and outlet system, whereas 56% of the farms have separate inlet and outlet. Rest (12%) has no provision of inlet and outlet. The ponds were ploughed manually, mechanically or both. The ponds were ploughed up to three times during the pond preparation. A maximum 70% of the farms ploughed their ponds only once, followed by 20% of the farms twice, another 10% do not plough. Ploughing facilities exposed the hidden

layers to the sun and eliminates toxic gases such as ammonia, hydrogen sulphide and methane produced in the pond due to previous crop (Kongkea 1995). For desilting, the maximum ponds (82%) desilted upto 5 cm. whereas only 8% of the farms desilted their ponds upto 10 cm, another 10% have not been desilted. For liming, farmers used quick lime, agricultural lime and dolomite without assessing the soil pH. Liming is done by applying CaO @ 500-600 kg/ha added with CaCO₃ @ 100-500 kg / ha in the beginning to 60-100 kg/ha towards the terminus for 3-4 days. Among the surveyed ponds 61% of the farms took 30 days or less to prepare their ponds, where as 39% took it for 31-50 days. Kongkea (1995) attributed that pond preparation to successful shrimp farming in Thailand suggested a minimum period of 30 days for the same. In the present study it was noticed that most of the farms (79%) introduced hatchery raised seed from Andhra Pradesh and West Bengal followed by both hatchery born and wild seed (11%) and others (10%) incorporated seed from wild collection. The stocking density adopted in present observation varied from @ 20-30/m². Maximum number of the farms were stocked with @ 20-25/m² (54%) followed by @ 30/m² (26%) and @ 18-20/m² (20%). The survey revealed that most of the farms used formulated commercial feed (C.P. Aqua, Water base, Godrej or Wockhart), while few farms used local feed. Maximum number of farms adopted a combination of broadcasting and check tray method as feeding strategies. Feeding frequencies mostly adopted by 65% of the farms @ 4 times day⁻¹ followed by 22% @ 3 times in a day & 13% @ 2 times feeding day⁻¹. The mean water exchange adopted per day in farms observed that 89% adopted water exchange depending upon their need. 87%

adopted water exchange @ 1-5 times/crop, 8% of the farms @ 5-10 times/crop and 5% of the farms @ >10 times/crop. The present study also revealed that most of the farms (65%) used pumping as a means of aeration and 25% used paddle wheel aerator, 10% used both the system. The most of the farms harvested their produce by drain harvest using bag net. Other nets employed were cast and drag nets. The average body weight of the shrimp recorded in farms ranged from 18- 34g. The maximum of the farms (85%) reported average body weight of 29-32g; while the min of 15% farms recorded 18-25gm. The average. production recorded in the farms varied from <1000 kg/ha in 17% of the farm to >2,900 kg/ha in 7% of the farms. Most of the farms (76%) recorded the average production in the range of 2301-2600 kg/ha/crop.

CONCLUSION

Shrimp culture can give miracles towards socio-economic development for a large number of rural people. But the only factor that is pulling them back is because of many uncertainty and unpredictability existing there on. An optimum output cannot be assured even after taking the risk of huge investment. The export policy promotion, distinct quality measures, application of scientific method, proper quality control mechanism targeted to marketing strategy, and presence of modern technology , sustainable market price, insufficient supply of institutional credit and such other ancillary facilities are the crucial factors, for sustainability and long term viability of the industry.

For the sustainability of this industry, it is essential that extensive training programme be conducted for farmers, in order to develop

ECONOMICS OF SHRIMP FARMING (5,000 M² POND) ON 2012.

Sl. No.	Particulars	2012	TOTAL COST
A.	Capital Cost	Amount (Rs.)	Amount (Rs.)
1.	Construction of ponds	1,70,000	Total Capital Cost=4,46,000
2.	Inlet and outlet structure of pond,	36,000	
3.	Pump house cum workshop	26,000	
4.	Watchman shed	18,000	
5.	Pumps (15 HP)	40,000	
6.	Aerators (1 HP) with accessories, 4 Nos.	85,000	
7.	Electric installation with electrification	25,000	
8.	Land and farm equipments	27,000	
9.	Miscellaneous	19,000	
	Total	4,46,000	
B.	Variable Cost	Amount(Rs)	
1.	Lease amount @ Rs. 1,00,000/year	1,25,000	Total Variable Cost=10,45,000
2.	Water accumulation cost	20,000	
3.	Chemicals and manure @ Rs. 30,000 /ha	20,000	
4.	Cost of seeds @ Rs. 50,000/ 1 lakh seeds (1,50,000 nos/5000 m ²)	1,00,000	
5.	Cost of feed @ Rs. 72/Kg	4,25,000	
6.	Fuel charges	60,000	
7.	Electricity charges	42,000	
8.	Labour charges	1,20,000	
9.	Medicines	68,000	
10.	Annual maintenance and repairing cost	15,000	
11.	Miscellaneous	50,000	
	Total	10,45,000	
C.	Fixed Cost	Amount (Rs.)	Total Fixed Cost=2,08,610
1.	Depreciation on capital cost @ 10%	44,600	
2.	Interest on capital cost @ 11%	49,060	
3.	Interest on variable cost @ 11%	1,14,950	
	Total	2,08,610	
D.	Total Expenditure over 5000m² area for one crop	12,53,610	12,53,610
E.	Total Income		
	Selling price @ Rs. 170/kg in 2012 Note: Stocking density 30 Nos. Seed/m ² = 30 X 5,000 = 1,50,000, Survival @ 65% = 97,500 and Total biomass = 97,500 X 35 gm = 3412.5 kg	5,80,125	5,80,125
F.	Profit/Loss (Revenue – Total Expenditure)	- 6,73,485	- 6,73,485
Average Net LOSS over 5000m² area for one crop on 2012 = 6,73,485			

confidence to practice shrimp culture. Crop insurance facilities should be introduced so that the farmers would not bury them under debt burden if there is a loss. The motto should be to practice an economically and ecologically viable shrimp culture. Besides all these, Government efforts in implementing a proper planning and management oriented marketing strategies are required for the sustainability of the industry. The adoption of such measures can revive the shrimp industry and make it a major contributor in earning foreign exchange for our country.

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