Performance of freshwater prawn under carp polyculture system in farm ponds in Sivaganga district, Tamil Nadu

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ABSTRACT

Frontline demonstrations (FLDs) were carried out at 5 farmers' farm ponds in Sivaganga district, Tamil Nadu to study the performance of freshwater prawn under carp polyculture system. Results revealed that survival rate was higher in treatment ponds and during the 6 months culture period catla, rohu and prawn grew to a size of 525, 450 and 44 g respectively. FLD farm ponds of 0.1 ha recorded higher fish yield of 147.00, 53.32 and 67.76 kg of catla, rohu and prawn respectively in comparison to control pond which recorded 129.60, 78.75 and 27.60 kg of catla, rohu and prawn respectively. Under FLDs farmers could realize a net return of Rs 1,74,332/ha with a benefit-cost ratio of 2.29.

Keywords: Carp; freshwater prawn; polyculture system; farm pond

INTRODUCTION

Polyculture of fishes in pond is practiced prevalently in many countries where stocking strategies are determined by the feeding habits of fish taking into account the natural feeds available in the various ecological niches within the pond (Alam et al 2001). The freshwater prawn, *Macrobrachium rosenbergii* has attracted enormous interest as an aquaculture species for polyculture across the globe (Perry and Tarver 1987). Polyculture of giant freshwater prawn along with carp is more popular compared to monoculture practice among fish farmers due to the high cost of management, low survival and differential growth of prawn under monoculture systems (Cohen et al 1983, Vasudevappa et al 1999, 2002). Also polyculture of prawn with fish improves the ecological balance of the pond water preventing the formation of massive algal blooms (Cohen et al 1983).

Sivaganga district situated in the southern agro-climatic zone of Tamil Nadu has moderate climatic condition and the weather is uniformly salubrious. The district gets major rainfall during the northeast monsoon period. The average annual rainfall of the district is about 800 mm. Farm ponds have been found to be an ideal solution in these conditions and have been well accepted by the farmers in the district. They are relatively small in size which allows them to be filled by even small amounts of rain and to fit well in the small plots of land owned by marginal farmers. Apart from meeting various needs of farmers viz crop irrigation and water for animal husbandry, farm ponds act as secondary source of income by supporting aquaculture activity. Farmers in the district carry out polyculture of carp with prawn in the farm ponds. However due to lack of scientific knowledge and proper management practices the production is low with lesser income. Hence it was planned to conduct frontline demonstrations (FLDs) on the polyculture of carp with prawn in farm ponds with the objective to demonstrate the scientific farming practices and increase the fish production and income of the farmers.

MATERIAL and METHODS

In order to demonstrate the polyculture of carp with prawn in farm ponds FLDs were conducted in farm ponds of 5 farmers in 2 blocks of the district viz Thirupattur and Sivaganga.

Selection of farmers

In the selected two blocks, farmers were made aware about scientific farming practices on polyculture of carp with prawn through trainings, seminars and lectures organized by the Krishi Vigyan Kendra scientists. During these programmes farmers were asked to give their requirement to go for scientific farming practices on polyculture of carp with prawn at their farm ponds. Only those farmers who were willing to take up polyculture as per the guidelines of the KVK experts were selected. It was made mandatory to the farmers that demonstration farm pond should be along the roadside so that maximum number of visitors could see the performance of the polyculture system. The participating farmer had also undertaken the fish farming practices being practiced by them as earlier and therefore it became easy to make comparison between treatment under demonstration and control ponds (farmers' practice).

Package of practices followed

Earthen farm ponds of 0.1 ha area were utilized for the study. The pond was drained, dried and limed using agriculture lime at 250 kg/ha. The pond was manured using 400 kg cow dung and a monthly dosage of 200 kg cow dung was applied. The pond was stocked with 350 catla and 150 rohu fingerlings (90-110 g) along with 2,000 prawn juveniles (2-5 g). For one hectare the fish and prawn stocking density was worked out to be 5,000 fish and 20,000 prawn juveniles. For the farm ponds under demonstration KVK provided only the fish fingerlings and prawn juveniles and all other inputs were applied by the farmers themselves at their own level as per the advice of the KVK scientists. For control ponds farmers stocked fish and prawn at their own level as they were practicing earlier.

RESULTS and DISCUSSIONS

Growth parameters and yield

The details regarding survival, growth rate, production and yield of polyculture of carp with prawn are presented in Table 1. The survival rate of catla, rohu and prawn in FLD farm ponds was 80, 79 and 77 per cent as compared to 72, 70 and 69 per cent in control ponds respectively. During the 6 months culture period catla fingerlings of 110 g mean weight grew to a size of 525 g while rohu of initial weight of 90 g attained 450 g and prawn reached 44 g from the initial weight of 3.5 g in FLD ponds. The growth in control ponds was lower than the FLD ponds. The final weight of catla, rohu and prawn in control pond was 450, 375 and 39 g respectively. FLD farm ponds of 0.1 ha recorded higher fish yield (147.00, 53.32 and 67.76 kg)

Table 1. Comparative performance of polyculture of carp and prawn under demonstration and farmers' practice

Parameter	Demonstration	Control (farmers' practice)
Survival (%)		
Catla	80	72
Rohu	79	70
Prawn	77	69
Initial mean weight (g)		
Catla	110	110
Rohu	90	90
Prawn	3.5	3.5
Final mean weight (g)		
Catla	525	450
Rohu	450	375
Prawn	44	39
Production (kg/0.1 ha)		
Catla	147.00	129.60
Rohu	53.32	78.75
Prawn	67.76	27.60
Yield (kg/ha)		
Catla	1470.00	1296.00
Rohu	533.25	787.50
Prawn	677.60	276.00

of catla, rohu and prawn respectively in comparison to control pond which recorded 129.60, 78.75 and 27.60 kg of catla, rohu and prawn respectively. The total production per hectare was worked out to 2,680.85 kg with fish contributing to 2,003.25 kg (74.72%) and prawn 677.60 kg (25.28%) in the FLD pond. Whereas in the control pond total production per hectare was worked out to 2,359.50 kg with fish contributing to 2,083.50 kg (88.30%) and prawn 276 kg (11.70 %).

This indicates that higher survival growth and yield of carp and prawn is obtained under polyculture system with scientific management practices. Hence it is imperative to encourage the farmers to adopt scientific farming practices for polyculture of carps with prawn.

Economics of polyculture

The economics of polyculture of carp and prawn computed for 1 hectare given in Table 2 indicates a production worth Rs 1,35,000.00 and the total revenue realized was Rs 3,09,332.00. The net profit was Rs 1,74,332.00 in six months. The FLD pond resulted in BCR of 2.29 compared to 1.77 in the control pond indicating the high profitability of polyculture of carp and prawn in farm ponds.

Table 2. Economics of polyculture of carp and prawn under demonstration and farmers' practice for 1 ha

Parameter	Demonstration	Control (farmers' practice)
Gross cost (Rs/ha)	1,35,000.00	1,40,000.00
Gross return (Rs/ha)	3,09,332.00	2,48,400.00
Net return (Rs/ha)	1,74,332.00	1,08,400.00
Benefit-cost ratio (BCR)	2.29	1.77

CONCLUSION

Based on the results of frontline demonstrations conducted it can be inferred that in a polyculture system involving catla, rohu and prawn, a fish production of about 2,000 kg per hectare and prawn of about 680 kg/ha in 6 months growing period is possible and profitable in farm ponds. The study revealed that scientific farming practices of polyculture of carp and prawn in farm pond has more potential than the farmers' unscientific practice.

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