

On farm trial of Bangladesh Fisheries Research Institute (BFRI) evolved two aquaculture technologies

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Abstract

Two BFRI evolved aquaculture technologies - integrated rice fish farming and carp polyculture with over-wintered fingerlings under different stocking densities were tested during 2003-04. The study was coordinated with two local NGOs namely NICHITA and JNDP, Muktagacha, Mymensingh. Integrated rice fish farming technology was demonstrated in 9 plots each having an area between 60-100 dec. during boro season. Fifteen days after transplantation of rice seedlings, fingerlings of rajpunti (*Barbodes gonionotus*) of 7-10 g of individual weight were stocked in the rice fields at the density of 3,000 (T₁), 3,750 (T₂) and 4,500/ha (T₃). The corresponding final weight of fish after three and half months in treatments 1, 2 and 3 were 110±14.21, 101±16.55 and 86±22.28 g, respectively. The mean weight of fish in treatments 1 and 2 was significantly higher than treatment 3. Fish production obtained from treatments 1, 2 and 3 were 218.16±18.29, 239.70±25.11 and 236±24.66 kg/ha, respectively. On-farm demonstrations of carp polyculture using over-wintered fingerlings rohu (25-28 g), catla (24-26 g), mrigal (21-26 g) and grass carp (20-24 g) under different stocking densities were undertaken in nine earthen ponds (1,200-1,600 m²) for a period of six months at three different stocking densities. The stocking densities of treatment 1 (T₁), treatment 2 (T₂) and treatment 3 (T₃) were 2,000, 3,000 and 4,000/ha, respectively. Fish were fed with rice bran and mustard oil cake (3:1). Soft green grass and banana leaves were provided mainly for grass carp. At harvest, the production obtained in treatments 1, 2 and 3 were 2,325±74.75, 2,620±49.66 and 2,982±171.52 kg/ha, respectively. The results demonstrated higher growth of fish in treatment 1 than those of treatments 2 and 3. However, treatment 3 contributed relatively higher production than those of treatments 1 and 2, whereas, highest net benefit was received from treatment 2.

Key words: On-farm trial, Aquaculture technology, NGO

Research findings

Integrated rice-fish farming

- The mean weight of fish in treatments 1 and 2 were significantly higher ($p < 0.05$) than treatment 3, however, treatments 1 and 2 did not show any significant difference ($p > 0.05$).

- Stocking density of 3,000-3,750/ha was suitable for better production and as well as economic return.
- Rice-fish farming is an ideal way of integrating aquaculture-agriculture which can offer the best opportunities to make rural farmers involve in generating additional work, improving their income and nutritional status.

Polyculture of carps using over-wintered fingerlings

- Among the four species under the three treatments, the highest average weight ($1,589 \pm 130$ g) was attained by catla in treatment-1. Catla reached an average weight of $1,100 \pm 122$ g in treatment 2, and 856.00 ± 76.65 g in treatment 3.
- The mean harvesting weight of rohu was 746.15 ± 52.99 , 633.14 ± 55.08 , 614.40 ± 97.61 g; mrigal- 789.24 ± 75.33 , 726.53 ± 100.29 and 652 ± 69.20 g; and grass carp- $1,280 \pm 141.65$, $1,218 \pm 193.45$ and $1,240 \pm 189.59$ g in treatments 1, 2, and 3, respectively.
- Survival rates in different treatments were fairly high and ranged between 90 to 94%.
- The highest production was obtained from treatment 3, where carp were stocked with higher stocking density i.e. 4,250/ha. The lowest production of 2,264 kg/ha was obtained in treatment 1 where carp were stocked at 2,250/ha.
- In cost-benefit analysis, highest net benefit of Tk. 103,983 was obtained from treatment 2, followed by Tk. 96,621 and 93,277 from treatments 3 and 1, respectively.
- Although the level of fish production in the present study can not be considered very high but the production obtained in this experiment within six months culture period was very encouraging in terms of maximum individual weight.

Policy implications

- Policy decision should be taken to disseminate these technologies through GOs and NGOs for increasing fish production as well as to improve the socio-economic condition of rural farmers.
- DOF and BFRI should provide regular training to fish farmers to disseminate these refined technologies.
- The GOs and NGOs involved in the fisheries sector should take initiative to popularise these technologies among the rural farmers.

Livelihood implications

Farmers' livelihood can be improved by adopting modern and refined aquaculture technologies in their water bodies and rice fields with the application of proper input in a sustainable way. Only the proper use of sustainable technology by rural fish farmers can ensure increased fish production, nutritional upliftment and sustainable livelihood.