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Economic analysis of front line demonstrations of fish under composite fish culture system

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Abstract

Front Line Demonstration (FLD) on composite fish culture was carried out to evaluate yield and economic analysis of fish culture technique during two successive years 2012-13 and 2013-14 in Allahabad district, Uttar Pradesh. Total 48 demonstrations were conducted in 39.00 ha water area. The highest fish harvest was recorded 37.75 q/ha, percentage increase of fish harvest was up to 51%, in FLD pond under composite fish culture system. Gross return to the tune of Rs.2,71,950 and Rs 3,20,875 per hectare were recorded from FLD pond in the year 2012-13 and 2013-14, respectively. A net profit of Rs. 1,79,150 and Rs. 2,19,625 per hectare and benefit-cost ratio of 2.93 and 3.17 were observed, respectively. By conducting FLD of proven technologies, yield potential and net income from composite fish culture can be enhanced to a great extent with increase in the income level of the fish farming community.

Key words: FLD**,** Composite Fish Culture, Local check, Yield, Benefit-cost ratio

Introduction

India has become the third largest fish producing country in the world, with total fish production of 7.13 million tones in 2008. Off the total, about 47.2% (3.36 mm t) of total comes from the freshwater aquaculture that has placed the country as the second largest world aquaculture producer. Fresh water aquaculture mostly comprises the ponds, tanks and other seasonal water bodies. The average fish production from tanks/ponds is around 2.5 tonnes /ha, the production has remained very low in seasonal waters (Eknath *et al*. 2009).

KVKs (Krishi Vigyan Kendra) are grass root level organizations meant for application of technology through assessment, refinement and demonstration of proven technologies under different 'micro farming' situations in a district (Das 2007). Front Line Demonstration (FLD) is a long term educational activity conducted in a systematic manner in farmer's field to worth of a new practice/technology. Only newly released technologies or those likely to be released in near future are selected for the FLDs. Only critical inputs and training are provided from the scheme budget, remaining inputs are supplied by the farmers themselves. Training of the farmers associated with the frontline demonstrations is a pre-requisite for the programme. The target audiences of FLDs are both farmers and the extension officers. The purpose is to convince extension functionaries and farmers together about the potentialities of technologies for further wide scale diffusion. FLDs are used as a source of generating data on factors contributing higher crop yields and constraints of production under various farming situations. With an object to combat the causes of yield erosion and lower economic returns, dissemination of recommended technology through FLD was successfully attempted.

Methodology

District Allahabad

Allahabad is situated in the South-Eastern part of the state Uttar Pradesh. It lies between the parallels of $24^0 77'$ and $25^0 47'$ north latitudes and $81^0 19'$ and $82^0 21'$ east longitudes. Topographically, the district of Allahabad

belongs to the central plane zone of Uttar Pradesh. It has tropical climate that the average maximum temperature ranges between 43^0C - 47^0C which may go as high as 48^0C during peak summers. The minimum average temperature is 2-4^0C which may fall as low as 1.5^0C during peak winter months (December to January). The average rainfall of the district is 960 mm and the monsoon season is spread between July-September.

Selection of fish farmers and study area

Krishi Vigyan Kendra, Allahabad, has conducted 48 FLDs on composite fish farming under real farming situations between 2012-13 and 2013-14 at five different blocks namely Chaka, Jasra, Kondiyara, Karchhana and Shankergarh under K.V.K. operational area. Total 39.00 ha water area was covered. Before conducting FLDs, a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspects of fish farming (Venkattakumar *et al.* 2010). The necessary step for selection of site and farmers, layout of demonstration etc. were followed as suggested by Choudhary (1999).

Technologies Selected for Package Practices

Package practices of composite fish culture were conducted as per guideline of Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar (Anon 2005).Visits of the farmers and the extension functionaries were organized at demonstration plots to disseminate the message at large. Yield data were collected from local check pond (Farmer's practice) and demonstration ponds. Cost of production, net income and benefit cost ratio were computed and analyzed.

Data Analysis

1. $\%\ \text{Change in Yield} = \dfrac{\text{Yield Demo. - Yield Check}}{\text{Yield Check}} \times 100$

2. Net Return = Gross Return - Cost of Production.

3. $\text{B. C. Ratio} = \dfrac{\text{Gross Return}}{\text{Cost of Production}}$

4. Increased Cost= Cost of Production (Demo) -Cost of Production (Local Check).

5. Increased Return= Gross Return (Demo) - Gross Return (Local Check).

6. Effective Gain =Net Return (Demo) - Net Return (Local Check).

Results and Discussion

Present study revealed that six species of Composite Fish Culture has many advantages over local practice of fish culture. The yield performances are presented in Table 1. The data revealed that in FLD pond, the performance of fish yield was found to be substantially higher than that under local check during all the years 2012-13 and 2013-14. The yield of fish under FLD recorded was 36.26 q/ha and 37.75q/ha during 2012-13and 2013-14 respectively. The yield enhancement due to technological intervention was to the tune of 48.00% and 51.00% over local check. The year-wise fluctuations in yield and cost of production can be explained on the basis of variations in predominant social, economic and microclimatic

condition of that particular village. It was also found that depending on identification and use of farming situation, specific interventions may have greater implications in enhancing systems productivity (Mukherjee 2003).

Table 1Yield performance of FLD on composite fish culture

Year	No. of Farmer	Total area of pond	yield (q/ha)		% change in yield
			Demo pond	Local check pond	
2012-13	25	19.50	36.26	24.50	48.00
2013-14	23	19.50	37.75	25.00	51.00

Economic indicators i.e. cost of production, gross returns, net returns and BC ratio of FLDs are presented in Table 2. The data clearly revealed that, the net returns from the recommended practice were substantially higher than control plot, i.e. farmers practice during all the years of demonstration. The cost of production of FLD ponds were observed 92,800 Rs./ha and 1,01,250 Rs./ha; in the year 2012-13 and 2013-14 respectively. The gross return of FLD ponds was observed 2,71,950 Rs./ha and 3,20,875 Rs./ha; in the year2012-13 and 2013-14, respectively. Highest net return was observed in the year 2013-14, which was 2,12,500 Rs./ha.

Table 2 Economic indicators of FLD on composite fish culture

Year	Economics of demo. ponds (Rs. /ha)				Economics of local check pond (Rs./ha)			
	Cost of production	Gross Return	Net Return	BCR (R/C)	Cost of production	Gross Return	Net Return	BCR (R/C)
2012-13	92,800	2,71,950	1,79,150	2.93	83,400	1,83,750	1,00,350	2.2
2013-14	1,01,250	3,20,875	2,19,625	3.17	85,750	2,12,500	1,26,750	2.48

(Sale price of fish per kg was Rs. 75 and Rs. 85 in the year 2012-13 and 2013-14, respectively)

In case of FLD Economic analysis of the yield performance revealed that cost benefit ratio of demonstration plots were observed significantly higher than check pond. The cost benefit ratio of demonstrated and control plots were 2.93 and 2.2; 3.17 and 2.48 during 2012-13 and 2013-14 respectively. Hence, favourable benefit cost ratios proved the economic viability of the intervention made under demonstration and convinced the farmers on the utility of intervention. The data clearly revealed that maximum cost benefit ratio of 3.17, was observed during 2013-14. The variation in cost benefit ratio during different years mainly maybe on account of yield performance and input output cost in that particular year (Mishra *et al.*, 2009). Table 3 shows Increased Cost, Increased Return and Effective Gain in Composite Fish Culture. Increased Cost was higher in the year 2013-14 and it was 15,500 Rs./ha. Increased return was higher in the year 2013-14 and it was Rs./ha.1,08,375. Effective gain was higher in the year 2013-14 and it was 92,875 Rs./ha.

Table 3 Comparative studies on increased cost, increased return and effective gain in composite fish culture

Year	Increased Cost (Rs/ha)	Increased Return (Rs/ha)	Effective gain (Rs/ha)
2012-13	9,400	88,200	78,800
2013-14	15,500	1,08,375	92,875

Conclusion

The results of FLDs convincingly brought out that the yield of fish could be increased by 51% with the intervention on six species culture, supplementary feeding, pond fertilizing coupled with the disease management in Allahabad region. Favorable cost benefit ratio is self-explanatory of economic viability of the demonstration and convinced the farmers for adoption of intervention imparted. The present technology was very suitable for enhancing the productivity of fish and to supplement the income of fish farmer of the country.

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