

# Proceedings

National Conference on  
**Fisheries Economics,  
Extension and Management**

January 5 & 6, 2000

Editors

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# 11 ECONOMICS OF ADVANCED CARP FINGERLING REARING ENTERPRISE IN ORISSA

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## **Abstract**

The present study was undertaken to analyse the economics of fry to advanced fingerling rearing in Cuttack District of Orissa. An attempt was made to study the costs and earnings from the advanced fingerling rearing ponds with higher stocking density for longer rearing period. The variation observed in production and returns are discussed in relation to the inputs and management practices employed. The operational cost structure revealed that feeding expenses accounts more than 55% of the total cost of production. The percentage of net return over operational cost in all the ponds ranges between 60 - 63%. Some key issues relating to technical and economic aspects are also discussed.

## **Introduction**

The carp culture has developed tremendously as a commercial enterprise in India. Generally for carp culture, the farmers prefer advanced fingerling or young fish for stocking in their grow-out ponds, because of its easiness to culture low mortality rate, smaller duration for culture, etc. (Srivastava 1985). Hence, many carp seed producers are showing interest to produce such advanced fingerling or young fish with an objective of more profit from the ponds with size intermediate between rearing and growout ponds. Some of the seed farms in Orissa are producing the advanced fingerling or young fish to meet the ever increasing demands for it. This paper highlights the economic validity of rearing of fry to advanced fingerling for eleven months along with the details of operational and profitability.

## **Material and Methods**

Cuttack a district in the State of Orissa, where there is a steady demand for freshwater fish and where freshwater fish culture is popular and lucrative, was selected for the study. Baramba block of this district, which accounts 400 fish farmers, was purposely selected. This block has 378 ponds under fish culture practices belonging to Revenue Department, Gram Panchayat and FFDA beneficiaries. The estimated annual fry

requirement in this block is nearly 20 lakhs. Keeping all the above facts in view, three ponds (with details as shown in Table 1) were randomly selected from this block.

At the beginning of the culture practice, the weed eradication was done manually from all the ponds. The unwanted fishes were eradicated by repeated netting of the ponds. Then, fish toxicants Mohua Oil Cake at the rate of 200 ppm was applied to kill the left over unwanted fishes. After two weeks of eradication of unwanted fishes, the lime at the rate of 250 kg/ha was applied in three equal instalments to help mineralisation of organic matter and for prophylactic reasons in all the ponds. The pond fertilization was made by organic manure (cattle dung) at the rate of 1500 kg/ha in four equal instalments. Inorganic fertilizers like Urea at the rate of 100 kg/ha and SSP at the rate of 100 kg/ha were applied in three equal instalments during the rearing practice. After 3-4 days of manuring the ponds, aquatic insects were seen and were killed by spraying soap oil emulsions in the surface water at the rate of 18 kg soap: 56 kg oil/ha during still weather in all the ponds. After the testing of complete detoxification, 25-30 mm sized fries of Catla, Rohu and Mrigal collected from different sources were stocked in various combinations as shown in the Table 1 at density of 4 lakhs/ha. The fish fry's were fed with powdered groundnut oil cake and rice polish in 1:1 ratio at the rate of 1% of the body weight and this rate was increased to at the rate of 2% of the body weight in the final month of rearing. The rearing of these fingerlings was done for eleven months from August to June. Then, the advanced fingerlings or young fishes of size 100-150mm were harvested and sold to local private fish farmers. The various informations and data on operational costs and their returns were collected from the farmers during the eleven months study period (August 1998 to June 1999) and are presented in Table 2.

### **Results and Discussion**

The analysis of costs and returns from three fingerling-rearing units (Table 2) could throw light on the economic efficiency of the enterprise. The stocking density (at the rate of 4 lakhs fry/ha) in the ponds is higher compared to the normal rates of 2 lakhs fry/ha. Moreover, the fry to advanced fingerling rearing period is also extended upto eleven months instead of three months of usual rearing. These seeds are purchased from

the Govt. Carp seed hatcheries of Orissa. The survival rate is low almost in all the three ponds i.e. about 50-60% and the growth rate is being reduced due to high stocking density. The cost of production in the pond-A, pond-B and pond-C are Rs.62777/-, Rs.89502/- and Rs.107571/- respectively. It has been observed that the cost of production is lesser in large sized ponds compared to smaller ponds. The cost of production also depends on the stocking, harvesting, feeding and fertilization of the pond. Feeding practices account more than 50% of total cost of production in many culture practices (Rabanal and Shang, 1979; Shang, 1981; Wattanuchariya and Panayoton, 1982). The experiences of carp and milkfish culture in various countries indicate that fertilization and feeding increase the carrying capacity and consequently, the production increases many times (Shang, 1982). The present study revealed that the cost of feed for rearing the fry to advanced fingerling is almost 55% of the total operational cost. Owing to high demand, the advanced fingerling of 150 mm size were sold with a good price of Rs.3/- per advanced fingerling. The returns that were obtained from the pond-A, pond-B and pond-C are Rs.100, 800/-, Rs.146,280/- and Rs.174,960/-, respectively. Hence, the net returns obtained from the pond-A, pond-B and pond-C are Rs.38, 023/-, Rs.56, 777/- and Rs.67, 389/- respectively. Ranadhir *et al.* (1988) stated that the percentage of rate of return on capital is 33.2% in case of carp fingerling rearing for 3 months with normal stocking density. Bhoumik (1990) indicated that the percentage of return on variable cost is 33.3% under similar rearing conditions of carp fingerlings. The economics of polyculture of Indian and exotic carp implies that the percentage of return is 58.3% (Sinha, 1990). It has been observed that the percentage of profit in carp fingerlings rearing is up to 70% (Sivashankaran et al., 1995). The present study shows that the percentage of net return for rearing of advanced fingerlings in all the ponds ranges between 60-63%, though the survival rate is very low. Sivashankaran et al. (1995) also opined that, the rearing of the carp fingerlings gives better percentage of profit and these rearing practices has higher rate of profit compared to fish production and other allied activities which confirms the findings of the present study.

### **Conclusion**

The study indicated that the rearing of carp fry to advanced fingerling with high stocking density for longer rearing period is more profitable compared to fish production

and other allied activities besides providing gainful employment. It is also found that the advanced fingerlings reared in high stocking density give better survivability and growth in the growout system which is farmer friendly. It is recommended that the potential demand for advanced carp fingerlings of the region should be assessed and sufficient number of units should be started to maintain the growth of this industry. There is an urgent need for standardisation of proper stocking density and proper management techniques to rear the fry to advanced fingerling for a longer period to achieve more survivability and profitability.

**TABLE 1. Details of advanced carp fingerling rearing ponds**

	Pond-A	Pond-B	Pond-C
Location	Barambagarh	Gopamathura	Jhajia
Area	0.15 ha	0.23 ha	0.27 ha
Depth	2 mts.	2 mts	2 mts
Soil type	Black	Deep black	Black
Soil pH	7.8	7.1	8.2
Water pH	7.5	7.2	7.9
Seed source	Govt. Fish seed farm, Kausalyaganga	Govt. Fish seed project, Saramanga	Govt. Fish seed farm, Kausalyaganga
Species stocked	Rohu, Catla, Mrigal	Rohu, Catla, Mrigal	Rohu, Catla, Mrigal
Species ratio	30:40:30	40:40:20	35:40:25
Manure used	Cattledung + urea + SSP	Cattledung + urea + SSP	Cattledung + urea + SSP
Number stocked	60000	92000	108000
Percent survival	56 %	53 %	54 %

**TABLE 2. Operational costs and earnings of advanced Carp fingerling rearing ponds**

**A. INPUTS**

		Rate (Rs-/unit)	Pond A (in Rs)	Pond B (in Rs)	Pond C (in Rs)	
For manual clearance of aquatic weeds		-	300	400	500	
For eradication of unwanted fish by netting		-	400	500	500	
For killing of unwanted fish by Mohua oil cake @ 200 ppm		2/kg	1200	1840	2160	
Lime @ 250 kg/ha		2/kg	150	230	270	
Fertilizers	Organic @ 1500kg/ha (cattle dung)	0.2/kg	90	138	162	
	Inorganic @ 100kg/ha each	Urea	5/kg	75	115	135
		SSP	3/kg	45	69	81
For killing of insects	Soap @ 18kg/ha	30/kg	81	124	146	
	Oil @ 56litre/ha	10/litre	84	128	151	
Cost of fry		60/1000 nos	3600	5520	6480	
Cost of transportation		-	2000	3000	3000	
Cost of feed	Rice polish	2/kg	40482	51764	61555	
	GNOC	8/kg				
Harvesting charges		-	3000	3500	3500	
Wages for labor		-	7000	8000	12000	
Miscellaneous expenses e.g. tray, tub, net, hapa etc.		-	2000	2500	3000	
Interest on working capital @ 15% annually			8188	11674	14031	
<b>Total</b>			<b>62777</b>	<b>89502</b>	<b>107571</b>	

**B. RETURN**

Particulars	Pond-A	Pond-B	Pond-C
Total income from the sale of the advanced fingerlings @ Rs 3/- per advanced fingerling	Rs 100800	Rs 146280	Rs 174960

**C. NET PROFIT (B-A)**

Particulars	Pond-A	Pond-B	Pond-C
Profit	Rs 38023	Rs 56777	Rs 67389
% of profit over operational cost	60.56%	63.43%	62.64%

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