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AN ECONOMIC ANALYSIS OF FRESHWATER FISH CULTURE

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Total cost of production per hectare of pond was Rs. 13,983/-for Pond A and Rs.6,660/-for Pond B. The culture method followed was intensive one in the case of Pond A condition while it was semi-intensive one in the case of Pond B condition. One hectare of Pond yielded 5060 kg of fish under Pond A condition white it was 1340 kg under Pond B condition. Yield variations are due to the differences in the culture, season and intensity of culture. The cost of production per kilogram of fish was found to be Rs. 2.76 and Rs. 4.97 for Pond A and B conditions respectively. For every rupee of investment the return worked out to Rs. 1.81 and Rs. 1.01 under Pond A and Pond B condition.

Fish is one of the main sources of animal protein, the cost of which is cheaper than meat and chicken. India's fifty percent of population is below poverty line and therefore the increase in fish production through culture would certainly help to solve the problem of malnutrition and undernutrition. Unlike meat and chicken, fish is easily digestible. The other advantages of fish culture on commercial scale are the generation of additional employment and income. These factors would also help removal of poverty resulting in the reduction of total population below poverty line. Hence, an attempt is being made to analyse cost and return of freshwater fish culture so as to create awareness among farmers to take up fish culture whereever possible.

MATERIAL AND METHODS

A case study was carried out to analyse cost and returns per hectare fish pond under all India Co-ordinated research project on Composite Fish Culture. Two ponds were used with an area of 0.1 and 0.15 hectare respectively. These two ponds were designated as pond A (with perennial water supply) and Pond B (with well water). Pond A condition is of longer duration running for 300 days with six species combination while Pond B condition is of 144 days duration with four species combination The idea of taking up culture under these to different conditions was to study the impacts of intensive and semi-intensive culture methods. Pond A condition was considered as pond with intensive culture, whereas the Pond B condition as semi-intensive culture The data pertaining to these two ponds were collected and analyses were taken up to find out the cost of culture and the results were presented as variable cost, fixed cost and total cost incurred towards culture. Further, the

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analyses attempted to find out the cost of production per kilogram of fish both on variable cost basis and total cost basis. This study also estimated the profit margins by two methods. One is the gross income in excess of variable cost alone and the other is the gross income in excess of cost. Lastly, this paper attempts to find out the rate of return. This could also be estimated by two methods : one is considering investment on working capital alone as investment;another is total cost as invest ment (CMFRI. 1978).

RESULTS AND DISCUSSION

The present study analysed the economic impacts of two different conditions of culture taken up at Fisheries College. Stocking was done during the month of November, 1980 in both the ponds whereas harvesting was taken up during the month of Aprl, 1981 and September 1981 in Pond B and Pond A respectively.

Due to limited water supply in the wells the duration of culture was restricted to 144 days in Pond B. Further number of species cultured were also limited to four species with lesser stocking density in Pond B so as to make the system semi intensive one, when compared to that or Pond A (Foster, 1972).

The cost analysis presented in Table II inidcatad that the cost incurred towards seeds, manures, fertilisers and supplementary feeds for Pond A was twice that of the cost incurred for pond B This was mainly due to the fact that the intensity of culture practices followed in Pond A was relatively higher in Pond A when compared with Pond B. This indirect cost was also higher in the case of pond A condition since the use of fixed capital was more in the case of pond A than pond B condition.

Total cost of production per hectare of pond under Pond A condition was twice that of Pond B condition. This increased cost was attributed to intensive culture taken up in Pond A due to intensive stocking, the cost of seeds, labour, feeds and fertilisers.

Total production per hectare of Pond was estimated as 5060 kg in the case of Pond A condition in which intensive cultue was taken up while it was 1340 kg in the case of Pond B condition where semi-intensive culture was taken up. Even, if the production is assumed to be two crops in Pond B the productivity would be less because of lesser stocking densities.

The results of economic analyses carried out were presented in Table III. The total cost of culture was estimated as Rs. 13,983/- for a production of 5060 kg of fish in Pond A condition. The gross income worked out to Rs. 25300 at a price of Rs. 5/- per kilogram leaving a profit margin of Rs. 16,717/-when variable cost alone is considered, while net profit being estimated as Rs. 11,317/- when all the costs were taken into con-

sideration. The cost of production per kilogram of fish was Rs. 1.70 on variable cost basis and this being Rs. 2.76 when total cost was taken into consideration. The investment-return ratio showed that every rupee of working capital yielded Rs. 2.95 while the same being Rs. 1.81/- on the total cost basis.

Similarly the results for Pond B condition (Table III) indicated that the total cost of culture was estimated as Rs. 6660/-. This was half of the total cost incurred under Pond A condition. The difference in cost of culture was mainly due to culture methods followed. Lesser cost incurred in Pond B condition was attributed to semi-intensive culture method followed. The profit margin worked out were Rs. 3190/- per hectare when variable cost alone taken into consideration while net profit being Rs. 40/-considering all the costs. To produce one kilogram of fish, the total cost was estimated as Rs. 4.97/- and the same being Rs. 2.62 when variable cost alone considered. The input - output ratio analysis revealed that for every rupee of investment of working capital yielded a return of Rs. 1.91 while it was 1.01 on total cost basis when all the costs are taken into consideration.

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Table I. Season, area and stocking density fish ponds.

Species	Stocking density	
	No. stocked actually	Number stocked estimated to one ha
Pond A		
Silver carp	120	1200
Catla	50	500
Rohu	50	500
Mrigal	125	1250
Common carp	125	1250
Milk fish	25	250
Pond B		
Catla	50	334
Mrigal	150	1000
Common carp	200	1334
Cauvery carp	200	1334

Table 2 Break-up of cost and their percentage to the total cost.

Cost Components	Cost /ha(Rs)		Cost (Rs)		percentage	
	Pond A	Pond B	Pond A	Pond B	Pond A	Pond B
I. *Variable cost*						
a) Preparation to the Pond	35.00	50 00	350.00	333.33	2.50	5.01
b) Seeds	76.50	57.00	765.00	380.00	5.47	5.71
c) Manures and fertilisers	153.50	119.50	1535 00	796.67	10.97	11.96
d) Supplementary feed	333.30	105.00	3333 00	700 00	23.83	10.51
e) Labour	210.00	157.50	2100.00	1050.00	14.98	15.77
f) Water	—	25.75	—	171.75	—	2.58
g) Miscellaneous	50.00	11.75	500.00	78.25	3.63	1.16
Total variable cost	858.30	526.50	8583.00	3510.00	61.38	52.70
II. *Fixed cost*						
a) Depreciation	270.00	236 25	2700.00	1575.00	19.31	23.65
b) Interest on fixed capital	270.00	236.25	2700.00	1575.00	19.31	23.65
Total fixed cost	540.00	472.50	5400.00	3150.00	38.62	47.32
III. Total Cost	1398.30	999.00	13983.00	6660.00	100.00	100.00

Table 3 Economics of Composite Fish Culture.

Particulars	Units	Amount/ha (Rs)	
		Ponds A	Ponds B
Production of fish Kg		5060.00	1340.00
variable cost		8583 00	3510.00
Fixed cost		5400.00	3150.00
Total cost		13983.00	6660 00
Total returns		25300.00	6700.00
Return over variable cost		16717.00	3190.00
Net profit		11317.00	40 00
Cost of production per kilogram of fish			
(a) Variable cost basis		1.70	2.62
(b) Total cost		2.76	4.97
Input-output ratio			
(a) Variable cost basis		2.95	1.91
(b) Total cost basis		1.81	1.01