



AN ECONOMIC ANALYSIS OF CAPTURE AND CULTURE FISHERIES ACTIVITIES IN GULBARGA DISTRICT OF KARNATAKA

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ABSTRACT

The present study was conducted in Gulbarga district of Karnataka. The district has 22 fisheries cooperatives of which 17 are working and five are defunct. To accomplish the objective of the study, a random sample of six societies spread across four Taluks was selected. The study was based on primary data. The financial feasibility of fisheries cooperative societies was analyzed using Budgeting technique and Benefit-cost ratio. The capture fishing activity was more profitable than the culture fishing activity. In particular, the total variable costs incurred per quintal of culture fish was (₹ 6,772) more than that respect of capture fisheries (₹ 5,701). Also fixed costs per quintal of fish catch were more in culture fisheries (₹ 1,523) than in capture fisheries (₹ 1,011). As a result total costs of culture fisheries per quintal (₹ 8,296) were higher than total costs for capture fisheries (₹ 6,712). In addition to the higher costs incurred in fishing, the sale value per quintal of fish was also less (₹ 15,000) in culture fisheries when compared to the sale value of a quintal of capture fish (₹ 16,000). For each society, each of the six secretaries was asked to rank the above six problems from rank I to rank VI. The secretaries of fisheries cooperative societies ranked I the problem of depletion of water bodies due to the deposit of silt. Further, as many as 42.50 per cent of the members considered water scarcity as the very severe problem. The secretaries of fisheries cooperative societies ranked I the problem of depletion of water bodies due to the deposit of silt. Further, as many as 42.50 per cent of the members considered water scarcity as the very severe problem. Since fisheries is found to be economically viable as reflected by B:C ratio, efforts for desilting of the tanks will go a long way in making fisheries more promising enterprise.

KEY WORDS: Fisheries Cooperative, Economics, Budgeting Technique, B:C ratio, Problems and Garrett's Ranking.

INTRODUCTION

Fishery is an important sector in most of the developed and developing countries of the world from the stand point of income and employment generation. The experience in these countries indicates that the growth of the fishing sector stimulates the development and employment in related industries which contribute significantly to the total economic growth of the country. Fisheries can be broadly divided into two groups, as capture fisheries and culture fisheries. With an extensive coastal line extending along the mainland with a fairly wide continental shelf and slope and high sea beyond, the world has rich marine resources. The inshore waters forming the marginal sea together with the coastal inlets constitute an environment of high productivity offering great scope for culture of a wide variety of marine organisms. Similarly the inland fishery resources comprise two types of waters, namely the fresh water and the brackish, the former including river systems, an extensive network of irrigation canals, reservoirs, lakes, tanks, ponds etc. and the latter including the sprawling estuaries at the confluence of the river system with the sea, a large number of lagoons, brackish water lakes, impoundments and the vast areas of mangrove swamps containing tidal waters of fluctuating salinity. Indian fisheries are an important component of the global fisheries and the sector has been recognized as a powerful

income and employment generator. The contribution of this sector to foreign exchange earnings is substantial and forms 1.40 per cent of GDP. More than 6 million fishermen in the country depend on fisheries for their livelihood. Cooperatives are the shield of the weak and in India; fishermen are among the weakest sections of the community. Illiteracy, poverty, and lack of knowledge of latest fisheries technology are contributing factors. This vicious circle is further strengthened by lack of institutional support, both in infrastructure and finances. Consequently, fishermen are subjected to exploitation by middlemen, who act as money lenders, traders and contractors. The fishery co-operative movement in India began in 1913 when the first fishermen's society was organised under the name of 'Karla Machhimar (Fishermen) Co-operative Society' in Maharashtra. The state of West Bengal was the next to organise co-operative societies in the fishery sector in 1918. In the same year, Tamil Nadu also organised one co-operative society. The structure continued to grow over years into multi-functional units at the primary level, federations at district/regional, state and national levels. In Karnataka, there are 548 Fisheries Cooperative societies out of which 483 are working as on 31.03.2013. In Northern Karnataka, there are 13 districts. Fisheries Cooperative Societies are promoting fisheries activities in all these districts in various ways such as provision of

required equipments, fingerling and training facilities etc. Gulbarga is one of the important northern district of the state, where fisheries cooperatives was functioning for the promotion of economic welfare of their members. The present study was conducted with respect to Gulbarga district with an objective of analysing the economics of fishing activities of the members of fisheries cooperatives and to examining the problems faced by fisheries cooperatives and their members.

METHODOLOGY

The study was conducted in Gulbarga district. It has 22 fisheries cooperatives of which 17 are working and five are defunct. To accomplish the objective of the study, a random sample of six societies spread across four Taluks i.e., Afzalpur, Jewargi, Chittapua and Sedam taluk was selected. Further, a sample of 100 fishermen and 20 fisherwomen was randomly selected choosing 20 fishermen/fisherwomen members from each of the six fisheries cooperatives considered i.e., Meenugarike Sahakar Sangha-Mannur, Meenugarike Sahakar Sangha-Bandarwada, Meenugarike Sahakar Sangha-Kattisangavi, Dhanalaxmi Meenugarike Sahakar Sangha-Kundanoor, Mahila Meenugarike Sahakar Sangha-Ankeri and Kaagina Meenugarike Sahakar Sangha-Malkhed. The study was based on primary data. Economics of fisheries activity was analyzed using budgeting technique to estimate costs and returns from fishing activity both at capture and culture i.e., fish catch both from river and tanks, such fish catch consisted of various species selling at different prices, the weighted average price of fish was calculated by

$$WAP = \sum_{i=1}^n P_i * W_i$$

Where, WAP = Weighted average price

P_i = Price of i^{th} species

W_i = Proportion of i^{th} species in the total fish catch

The costs incurred in this analysis were Variable cost Fixed and cost. Variable cost consists of labour cost for catching fish, labour cost for fish marketing, cost of net repair, miscellaneous cost (cost of thermacoal and ice) and interest on working capital (9 %). The fixed costs consists of lease amount, depreciation on net, depreciation on butti, depreciation on teppa, depreciation on ice box and interest on fixed capital (11 %). For examining the problems faced by fisheries cooperatives Garrett's ranking technique was used to rank the problems faced by fisheries cooperatives. For this purpose six factors were first identified as important considered by the fisheries cooperative societies. For each society, each of the six secretaries was asked to rank the above six problems from

rank I to rank VI. In this analysis, rank I meant most important problem and rank VI meant least important problem. In the next stage, rank assigned to each problem by each individual was converted into per cent position using the following formula,

$$\text{Per cent position} = 100 (R_{ij}-0.5) / N_j$$

Where, R_{ij} stands for rank given for the i^{th} problem ($i= 1, 2, \dots, 6$) by the j^{th} individual ($j = 1, 2, \dots, 6$) and N_j stands for number of problems ranked by j^{th} individual.

RESULTS & DISCUSSION

Economics of fisheries activities undertaken by members

Table 1 presents economics of fisheries activities undertaken by members. The economics was worked out for the year 2012-13. Among the variable costs, labour cost for catching fish was significant one accounting for 88 per cent of the total variable cost. The next biggest item of variable cost was interest on working capital at nine per cent, which formed 8.25 per cent of the total variable cost. The total variable cost was of the magnitude of ₹ 1,02,624. The other components of variable cost like labour for marketing, net repairing etc were very meagre. The total fixed costs per member for river fishing amounted to ₹ 18,196. The fixed costs mainly consisted of depreciation on teppa (41.21%) and depreciation on net (33%). Depreciation on ice box and depreciation on butti accounted for 8.25 per cent and 6.86 per cent of the fixed costs. The lease amount paid was very meagre at less than one per cent of the fixed costs. Interest on fixed capital was calculated at 11 per cent and it amounted to around 10 per cent fixed costs. The total costs were ₹ 1,20,820. On an average each member caught 1,800 kgs of fish and sold an average price ₹ 160. The returns from sale of fish were ₹ 2,88,000 per member, the net return were ₹ 1,67,180. The B:C ratio of 2.83 indicated that capture fishing was a viable activity yielding a return of ₹ 2.38 for every one rupee spent. Jayaraman (1999) reported that, the average total cost was Rs.77,950/ha/ consisting of the total variable cost of Rs. 52,223 and the total fixed cost of Rs 25,727. The Total income and Net income were Rs. 1,45,824 and Rs. 67,874, respectively.

Table 2 presents the economics of capture fishing on quintal basis. The total variable costs incurred in catching a quintal of fish amounted to ₹ 5,701, which was mainly accounted for by labour cost (88%). The total variable costs per quintal of fish were ₹ 1,011 as mentioned earlier; this was mainly composed of depreciation on teppa, net, ice box and butti. The gross returns and net returns per quintal of fish workout to ₹ 16,000 and ₹ 9,288 respectively.

TABLE 1: Economics of capture fisheries activities undertaken by members during 2012-13 (₹/member)

Sl. No	Particulars	Qty (Kg)/No.	Price	Value (₹)
1	Variable cost (A)			
	a) Labour cost for catching fish	1,800 (Kg)	50	90,000 (87.69)
	b) Labour cost for fish marketing		2,000	2,000 (01.94)
	c) Cost of Net repair	3 (No)	50	150.00 (00.14)
	d) Miscellaneous cost (cost of thermacoal and ice)			2,000 (01.94)
	e) Interest on working capital (9 %)			8,473.50 (08.25)
	Total variable cost (A)			1,02,623.50 (100.00)
2	Fixed costs (B)			
	a) Lease amount		143	143.00 (00.73)
	b) Depreciation on Net	12 (No)	500	6,000 (30.85)
	c) Depreciation on Butti	5 (No)	250	1,250 (06.42)
	d) Depreciation on Teppa	3 (No)	3,000	9,000 (46.28)
	e) Depreciation on Ice box	3 (No)	375	1,125 (05.78)
	f) Interest on fixed capital (11 %)			1,926.98 (09.90)
	Total fixed cost (B)			19,444.98 (100.00)
3	Total cost (A+B)			1,22,068.48
4	Returns (4-3)			
	I) Return from sale of fish	1,800 (Kg)	160	2,88,000
5	Net returns			1,67,180.27
6	B : C Ratio			2.38

TABLE 2: Economics of capture fisheries activities undertaken by members during 2012-13 (₹/qtl)

Sl. No	Particulars	Value (₹)
1	Variable cost (A)	
	a) Labour cost for catching fish	5,000 (87.69)
	b) Labour cost for fish marketing	111.11 (01.94)
	c) Cost of Net repair	08.33 (00.14)
	d) Miscellaneous cost (cost of thermacoal and ice)	111.11 (01.94)
	e) Interest on working capital (9 %)	470.75 (08.25)
	Total variable cost (A)	5,701.30 (100.00)
2	Fixed costs (B)	
	a) Lease amount	07.94 (00.73)
	b) Depreciation on Net	333.33 (30.85)
	c) Depreciation on Butti	69.44 (06.42)
	d) Depreciation on Teppa	500.00 (46.28)
	e) Depreciation on Ice box	62.50 (05.78)
	f) Interest on fixed capital (11 %)	107.05 (09.90)
	Total fixed cost (B)	1,080.27 (100.00)
3	Total cost (A+B)	6,781.58
4	Returns	
	I) Return from sale of fish	16,000
5	Net returns (4-3)	9,218.42
6	B : C Ratio	2.35

Economics of culture fisheries activities undertaken by members

Table 3 presents the economics of culture fisheries activities undertaken by members. A comparative look at Table 4.4 and Table 4.6 makes it clear that the total variable costs incurred by a member in culture fishing amounted to ₹ 81,260 which was much less than ₹ 1,02,624 incurred in capture fishing. The reduction in the variable cost in respect of culture fishing was mainly on account of less labour cost incurred in catching the fish (₹ 60,000) as compared to that in capture fishing (₹ 90,000). As in the case of culture fishing, labour also engaged for catching the fish accounted for major proportion of variable cost (74%). The additional item of variable expenditure in respect of culture fishing was that of fingerlings, which formed 13 per cent of the variable costs. The total fixed cost in respect of culture fishing was ₹ 18,287 and thus very close to the fixed cost in respect of capture fishing. The total cost incurred by a member in

culture fishing amounted to ₹ 99,547 as against ₹ 1,20,820 in capture fishing. The fish catch per member in culture fishing was 1,200 kgs as compared to capture fishing (1,800 kgs). The price received by the fishermen in culture fishing was ₹ 150 per kg compared to ₹ 160 per kg in capture fishing. Thus, the gross returns per member in culture fishing were ₹ 1,80,000 compared to ₹ 2,88,000 in capture fishing. The net return per member in culture fishing were to the tune of ₹ 80,453, which were about half the net return from capture fishing (₹ 1,67,180). The B:C ratio of 1.8 in culture fishing indicated the viability of the activity and implied that every one rupee spent in the activity resulted in a gross return of rupee 1.80 (Table 4.7). Kujur et al. (2005) reported that, the economy of pig farming for a period of 6 months and pig-cum fish farming for 4 months indicated a net return on per rupee of investment to be Rs. 1.10, 2.26 and 1.13 on pig alone, fish alone and pig-cum fish, respectively under college farm

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condition, The corresponding values under village conditions were Rs. 167, 1.82 and 1.70 respectively. Table 4 presents economics of culture fisheries activities per quintal of fish caught in tanks. As the table reveals, the total variable cost per quintal of the produce was ₹ 6,771.61. This amount consisted of fingerling cost of ₹ 883.33, labour charge of ₹ 5,000, marketing cost of ₹ 166.66, net repair cost of ₹ 1,250, watchman salary of ₹

25, miscellaneous cost of ₹ 125 and working capital interest of ₹ 599.12. When examining the proportions of various components in the total variable costs, it is clear that fingerling cost formed 13.04 per cent, labour charge 73.83 per cent, marketing cost formed 2.46 per cent, net repair cost formed 0.18 per cent, watchman salary formed 0.36 per cent, miscellaneous cost formed 1.84 per cent and interest on working capital formed 8.84 per cent.

TABLE 3: Economics of culture fisheries activities undertaken by members during 2012-13 (₹/member)

Sl. No	Particulars	Qty (Kg)/No.	Price	Value (₹)
1	Variable cost (A)			
	a) Fingerling cost	10,600 (No)	1	10,600 (13.04)
	b) Labour cost for catching fish	1,200 (Kg)	50	60,000 (73.83)
	c) Labour cost for fish marketing		2,000	2,000 (02.40)
	d) Cost of Net repair	3 (No)	50	150.00 (00.18)
	e) Watchman salary	2 (No)	150/year	300.00 (00.36)
	f) Miscellaneous cost (cost of thermo coal and ice)			1,500 (01.84)
	g) Interest on working capital (9 %)			6,709.50 (08.25)
	Total variable cost (A)			81,259.50 (100.00)
2	Fixed costs (B)			
	a) Lease amount		100	100.00 (00.54)
	b) Depreciation on Net	10 (NO)	500	5,000 (27.34)
	c) Depreciation on Butti	5 (No)	250	1,250 (06.80)
	d) Depreciation on Teppa	3 (No)	3,000	9,000 (49.21)
	e) Depreciation on Ice box	3 (No)	375	1,125 (06.10)
	f) Interest on fixed capital (11 %)			1,812.25 (09.90)
	Total fixed cost (B)			18,287.25 (100.00)
3	Total cost (A+B)			99,546.75
4	Returns			
	I) Return from sale of fish	1,200 (Kg)	150	1,80,000
5	Net returns (4-3)			80,453.25
6	B : C Ratio			1.80

The fixed costs consisted of lease amount, depreciation on net, butti, teppa and ice box, and interest on fixed capital. On per quintal basis, lease amount was ₹ 8.33, depreciation on net was ₹ 416.66, depreciation on butti was 104.16, depreciation on teppa was ₹ 150 and depreciation on ice box was ₹ 93.75. These components of fixed costs formed 0.54 per cent, 27.34 per cent, 6.83 per cent, 49.21 per cent, 6.15 per cent and 9.90 per cent of the total variable costs in that order. The total fixed cost and the total variable cost per quintal of produce worked out to be ₹ 1,523.91 and ₹ 8,295.52 respectively. The returns from the sale of fish were ₹ 15,000 with the net returns of ₹ 6,704.48. As already mentioned in the above section, the B:C ratio in respect of culture fishing happened to be 1.80 implying that an expenditure of one rupee resulted in the gross returns of rupees 1.80 and the net returns of rupee 0.80. From the above discussion, it is clear that the capture fishing activity in was more

profitable than the culture fishing activity. In particular, the total variable costs incurred per quintal of culture fish was (₹ 6,772) was more than that respect of capture fisheries (₹ 5,701). Also fixed costs per quintal of fish catch were more in culture fisheries (₹ 1,523) than in capture fisheries (₹ 1,011). As a result total costs of culture fisheries per quintal (₹ 8,296) were higher than total costs for capture fisheries (₹ 6,712). In addition to the higher costs incurred in fishing, the sale value per quintal of fish was also less (₹ 15,000) in culture fisheries when compare to the sale value of a quintal of capture fish (₹ 16,000). It may be noted that the higher price realized for capture fish was on account of larger demand for fish species caught from river. These differences in cost and return structure of culture and capture fisheries ultimately resulted in higher B:C ratio for capture fisheries.

TABLE 4: Economics of culture fisheries activities undertaken by members during 2012-13 (₹/qtl)

Sl. No	Particulars	Value (₹)
1	Variable cost (A)	
	a) Fingerling cost	883.33 (13.04)
	b) Labour cost for catching fish	5,000.00 (73.83)
	c) Labour cost for fish marketing	166.66 (02.46)
	d) Cost of Net repair	12.50 (00.18)
	e) Watchman salary	25.00 (00.36)

	f) Miscellaneous cost (cost of thermo coal and ice)	125.00 (01.84)
	g) Interest on working capital (9 %)	599.12 (08.84)
	Total variable cost (A)	6,771.61 (100.00)
2	Fixed costs (B)	
	a) Lease amount	8.33 (00.54)
	b) Depreciation on Net	416.66 (27.34)
	c) Depreciation on Butti	104.16 (06.83)
	d) Depreciation on Teppa	750.00 (49.21)
	e) Depreciation on Ice box	93.75 (06.15)
	f) Interest on fixed capital (11 %)	151.01 (09.90)
	Total fixed cost (B)	1,523.91 (100.00)
3	Total cost (A+B)	8,295.52
4	Returns	
	I) Return from sale of fish	15,000
5	Net returns (4-3)	6,704.48
6	B : C Ratio	1.80

TABLE 5: Overall economics of fisheries activities (Capture + Culture) undertaken by members during 2012-13 (₹ /member)

Sl. No	Particulars	Qty (Kg)/No.	Price	Value (₹)
1	Variable cost (A)			
	a) Fingerling cost	27,000 (No)	1	27,000 (15.72)
	b) Labour cost for catching fish	2,500 (Kg)	50	1,25,000 (72.81)
	c) Labour cost for fish marketing		2,000	2,000 (01.16)
	d) Cost of Net Repair	4 (No)	50	200.00 (00.11)
	e) Watchmen salary	2 (No)	150/year	300.00 (00.17)
	f) Miscellaneous cost (cost of thermo coal and ice)			3,000 (01.74)
	g) Interest on working capital (9 %)			14,175 (08.25)
	Total variable cost (A)			1,71,675.00 (100.00)
2	Fixed costs (B)			
	a) Lease amount		100	100.00 (00.39)
	b) Depreciation on Net	15 (No)	500	7,500 (29.89)
	c) Depreciation on Butti	6 (No)	250	1,500 (05.97)
	d) Depreciation on Teppa	4 (No)	3,000	12,000 (47.83)
	e) Depreciation on Ice box	4 (No)	375	1,500 (05.97)
	f) Interest on fixed capital (11 %)			2,486 (09.90)
	Total fixed cost (B)			25,086.00 (100.00)
3	Total cost (A+B)			1,96,761.00
4	Returns			
	I) Return from sale of fish	2,500 (Kg)	150	4,00,000.00
5	Net returns (4-3)			2,03,239.00
6	B : C Ratio			2.03

Overall economics of fisheries activities (Capture + Culture) undertaken by members

It was also intended to examine the overall (culture + capture fisheries) in the study area. These results are presented in table 5 and 6. These results presented in table 4.9 pertain to the costs and returns in overall fishing per member. It may be noticed from the table that the labour cost for catching the fish accounted for the maximum proportion (about 73%) of the total variable costs, as which was of the order of ₹ 1,71,675. The fixed costs comprising of lease amount, depreciation on net, butti, teppa and ice box, and interest at 11 per cent amounted to ₹ 25,086. Thus the total cost per member amounted to ₹ 1,96,761. The fish yield of 2,500 kgs fetched a price of ₹

150 per kg on an average and led to the gross returns of ₹ 4,00,000. After accounting for the total cost, net returns amounted to ₹ 2,03,239. The B:C ratio for the overall situation was 2.03, which indicated a return of ₹ 2.03 for an expenditure of one rupee in fishing. Table 4.6 (B) presents economics for overall situation per quintal of fish. As the table depicts, the per quintal total variable costs were to the tune of ₹ 6,867. Also, the per quintal total fixed costs happened to be ₹ 1,003 per quintal with the total cost of ₹ 7,870. Returns from the sale of a quintal of fish in the overall situation were ₹ 15,000 leading to the net returns of ₹ 7,130.

TABLE 6: Overall economics of fisheries activities (Capture + Culture) undertaken by members during 2012-13 (₹/qtl)

S. No	Particulars	Value (₹)
1	Variable cost (A)	
	a) Fingerling cost	1,080 (15.72)
	b) Labour cost for catching fish	5,000 (72.81)
	c) Labour cost for fish marketing	80.00 (01.16)
	d) Cost of Net Repair	08.00 (00.11)

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	e) Watchmen fee	12.00 (00.17)
	f) Miscellaneous cost (cost of thermo coal and ice)	120.00 (01.74)
	g) Interest on working capital (9 %)	567.00 (08.25)
	Total variable cost (A)	6,867 (100.00)
2	Fixed costs (B)	
	a) Lease amount	04.00 (00.39)
	b) Depreciation on Net	300.00 (29.89)
	c) Depreciation on Butti	60.00 (05.97)
	d) Depreciation on Teppa	480.00 (47.83)
	e) Depreciation on Ice box	60.00 (05.97)
	f) Interest on fixed capital (11 %)	99.44 (09.90)
	Total fixed cost (B)	1,003.44 (100.00)
3	Total cost (A+B)	7,870.44
4	Returns	
	D) Return from sale of fish	15,000
5	Net returns (4-3)	7,129.56
6	B : C Ratio	1.90

CONCLUSION

It can be concluded from the results of the study that, the total variable costs incurred per quintal of culture fish was (₹ 6,772) more than that respect of capture fisheries (₹ 5,701). Also fixed costs per quintal of fish catch were more in culture fisheries (₹ 1,523) than in capture fisheries (₹ 1,011). As a result total costs of culture fisheries per quintal (₹ 8,296) were higher than total costs for capture fisheries (₹ 6,712). In addition to the higher costs incurred in fishing, the sale value per quintal of fish was also less (₹ 15,000) in culture fisheries when compared to the sale value of a quintal of capture fish (₹ 16,000). It may be noted that the higher price realized for capture fish was on account of larger demand for fish species caught from river. The secretaries of fisheries cooperative societies ranked I the problem of depletion of water bodies due to the deposit of silt. Further, as many as 42.50 per cent of the members considered water scarcity as the very severe problem. Since fisheries is found to be economically viable as reflected by B:C ratio, efforts for desilting of the tanks will go a long way in making fisheries more promising enterprise. Lack of market place for fish was very severe problem for around 42.00 per cent of the members, while it was a severe problem for another 44.00 per cent. Thus, there is a need for ear making a separate place for marketing of fish with basic infrastructure. It was clear from the results that still a

significant proportion of the members of fisheries cooperatives were not provided free materials such as net, life jacket, ice box, bicycles etc. Thus, steps have to be taken to ensure that such materials are distributed to every member to improve the efficiency of fishermen.

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