



Profitability of Fish Production in Selected Districts of North Karnataka, India

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Authors' contributions

This work was carried out in collaboration among all authors. Author HKHR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors JBR and RY managed the analysis of the study. Author RY managed the literature searches and data collection. All authors read and approved the final manuscript.

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ABSTRACT

The present investigation is the study of the profitability of fish production in Belagavi and Dharwad Districts of North Karnataka. The present study is purely based on primary data and multistage random sampling technique was employed for collecting data relevant to fish production from 60

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farmers (30 farmers from each of the two districts) practicing fish culture in farm ponds with the help of pre-tested interview schedule exclusively designed for the study. Average pond size considered for the study was 30x30 m². The data was analyzed by using Benefit Cost Ratio (BCR). The results revealed that, total cost incurred for fish production was Rs. 57579/pond/year in Belagavi and Rs. 49042/pond/year in Dharwad district. The average yield realized per pond was found to be higher in Belagavi district (1400kg/pond/year) than Dharwad district (1000kg/pond/year). Benefit Cost Ratio (BCR) was found to be 1.32 and 1.58 for Dharwad and Belagavi district respectively; these indicated that fish production was profitable in the study area.

Keywords: Fish production; economic analysis; benefit cost ratio; fish pond; net returns.

1. INTRODUCTION

“India is the third largest fish producing and second largest aquaculture producing country in the world. India is blessed with good marine and inland water resources, under marine resource India possess a coastline length about 8,118 kilometer, 2.02 million sq. km of Exclusive Economic Zone (EEZ), 0.53 Million Sq. km of continental shelf, 1537 fish landing centers and 3432 fishing villages. Inland resources consist of 3.15 million hectare area under reservoirs, 2.36 million hectare area of tanks and ponds, 1.24 million hectare area of brackish water and 0.19 million hectare length of rivers and cannels” [1].

“Hence there is a huge scope for fisheries and aquaculture in India. In 2017, the total fish production in India was 12,327 thousand tonnes with a share of 3,562 thousand tonnes from marine and 8,765 thousand tonnes of Inland. Andhra Pradesh is the highest Inland fish producing state of about 2861 thousand tonnes and Gujarat is the highest marine fish producing state of about 708 thousand tonnes. The fish production had risen from 752 thousand tonnes from 1950 to 12,327 thousand tonnes in 2017 with 5.06 percent growth. Fisheries sector contributes 5.23 per cent to Agriculture GDP and 0.91 per cent to overall GDP. This sector provides employment to 14 million people” [1].

“Karnataka has a costal length of 300 Km. Surface water in Karnataka is available in the form of rivers, waterfalls, lakes, reservoirs, etc., has water potential about 102 Km. Karnataka possess 17 lakh million cubic meters of surface water, which is six per cent to total countries surface water. Karnataka has seven river basins like, Krishna, Cauvery, Godavari, West flowing rivers, North pennar, South pennar and Palar. This State has 36,753 tanks with a capacity of about 6,84,518 hectares. In 2016, the total inland fish production in Karnataka was 1,58,568 Mts. Shivamogga, Mandya and Bellary are top three

fish producing districts about 17,443 Mts, 12,924 Mts and 10,388 Mts respectively. Karnataka contributes about (4.64 %) to total fish production in India. In North Karnataka, Bagalkote, Belagavi, Vijayapura, Dharwad, Gadag, Haveri, Shivamogga and Uttara Kannada districts are come under the Jurisdiction of University of Agricultural Sciences, Dharwad. Among these districts Belagavi was the second highest (4,760 Mts) and Dharwad was the second lowest (1,973 Mts) in fish production” [2].

2. MATERIALS AND METHODS

2.1 Study Area and Sampling Framework

The present study was conducted in Dharwad and Belgaum districts of North Karnataka, India. The multistage random sampling technique was employed. In the first stage, by considering the growth of fish production, Dharwad and Belgaum districts of North Karnataka was selected. In the second stage, out of five taluks in Dharwad district, three taluks (Dharwad, Hubli and Navalgund) and out of ten taluks in Belgaum district, three taluks (Belgaum, Chikkodi and Gokak) were selected purposively. In this third stage, from each taluk ten fish producing farmers were selected with the help of Krishi Vigyan Kendra (KVK) Dharwad and Belagavi thus making up total sample size of 60. The study was purely based on primary data; required information on input usage, yield obtained etc., was collected through personal interview method from fish producing farmers with the help of well-structured and pre-tested interview schedule exclusively designed for the study. The average size of pond considered for the study was 30x30 m², farm ponds that were considered for the study were not purposively used for fish production.

2.2 Analytical Tools

Benefit Cost Ratio (BCR) was used to examine the cost and returns; constraints in fish

production. It was worked out by dividing the total revenue with total cost.

$$B:C \text{ ratio} = TR/TC$$

Where,

TR= Total returns obtained from fish production

TC= Total cost incurred fish production

3. RESULTS AND DISCUSSION

3.1 Total Cost Incurred for Fish Production in the Study Area

The Table 1 presents a comprehensive analysis of the cost of production for freshwater fish farming in selected districts of North Karnataka, specifically Belagavi and Dharwad. The costs are categorized into Fixed Costs (FC) and Variable Costs (VC) for a 30 x 30 square meters pond over a year.

3.1.1 Fixed cost

The average fixed costs incurred for fish production (30x30 m² pond) was Rs. 24075, which accounts nearly for 45.72 per cent of total cost of production. Total fixed cost incurred for fish production in Belgavi district is Rs. 25338/pond which is higher than Dharwad district (Rs. 22813/pond). Among the fixed cost, tarpaulin costs accounts more in both the districts (Rs. 9800) suggesting uniform usage pattern, followed by depreciation on farm implements (Rs. 6382 in Belagavi and Rs.5484 in Dharwad).

3.1.2 Variable cost

The average variable costs incurred was Rs.28996/pond/year which accounts nearly 54 per cent of total cost of cultivation. With regards to spatial difference in the costs between Belgavi and Dharwad districts, the total variable cost was higher in Belagavi (Rs. 32241/pond) than in Dharwad (Rs. 26229/pond) and these accounts around 56 and 53 per cent respectively. Among the variable costs, cost incurred on fingerling was higher in both the districts i.e Rs. 10584 in Belagavi and Rs. 9485 in Dharwad district was as similarly earlier reported [3].

3.1.3 Total cost of production

The total cost involved for fish production in Belagavi district was Rs.57,579/pond/year, of

which the total fixed cost was Rs.25,338/pond/year (43.87 % of the total cost) and total variable costs was Rs.32,241/pond/year (56.13 % of the total cost). While in Dharwad district, total cost involved for fish production was Rs.49,042/pond/year, for which total variable costs was Rs.26,229/pond/year (53.63 % of total cost) and total fixed cost was Rs.22,813/pond/year (46.37 % of total cost). Overall, in both the district average total cost of fish production was Rs.53,071/pond/year, for which total variable cost contributes Rs.28,996/pond/year (54.28 % of the total cost) and total fixed cost contributes Rs.24,075/pond/year (45.72 % of the total cost), similar findings were also reported [4,5,6].

The expenses towards buying of tarpaulin, and construction of fish pond were the greatest contributors to total fixed cost in both the districts under study. Similarly, the cost of purchasing fingerling and charges towards fuel and electricity contributed highest to the total variable cost. The cost of fish feed amounted to 5.65 per cent of the overall cost of production. The results revealed that, total cost involved in fresh water fish production in Belagavi was more as compared to Dharwad district; this is mainly because of quality of inputs and source of availability of inputs to the farmers in Belagavi was superior to the Dharwad district farmers.

3.2 Returns Obtained from fresh Water Fish Production in Dharwad and Belagavi Districts of North-Karnataka

Returns obtained from fresh water fish production in Dharwad and Belagavi districts of North Karnataka was presented in Table 2. The analysis of total returns from fish production indicates that the total returns obtained per pond (30x30m) per year in Belagavi district was Rs.91,000, while it was Rs.65,000 per pond (30x30 m²) per year in Dharwad district. On an average Rs.78,000/pond/year was obtained from fish production.

Fish production in the study area was found to be profitable as indicated by per pond net returns. Net returns in Belagavi district was Rs.33,512/pond/year and in Dharwad district was Rs.15,958/pond/year. The average net returns was Rs.18,429/pond/year [7,8]. Benefit cost ratio was used to analyse the cost and returns of fish production. The B:C ratio ranged between 1.58 and 1.32 for Belagavi and Dharwad respectively. The overall B:C ratio of in both the districts was

Table 1. Cost of production of fresh water fish in selected districts of North Karnataka (30 x 30m² pond/year)

Sl. No.	Particulars	Districts				(Rs./Pond/year)	
		Belagavi (n ₁ =30)		Dharwad (n ₂ =30)		Pooled (n=60)	%
			%		%		
I Fixed cost (FC)							
1	Construction of fish pond	4894	8.49	4289	8.74	4592	8.65
2	Rental value of land	896	1.55	238	0.49	567	1.06
3	Depreciation	6382	11.00	5484	11.11	6118	11.52
4	Fish nets	648	1.12	558	1.13	603	1.13
5	Tarpaulin	9800	17.00	9800	19.98	9800	18.46
6	Interest on FC @ 12%	2714	4.71	2444	4.98	2601	4.90
	Sub total	25338	43.87	22813	46.37	24075	45.72
II Variable Cost (VC)							
1	Fish feed	4000	6.94	2000	4.07	3000	5.65
2	Fertilizer	924	1.60	648	1.32	786	1.42
3	Fingerlings	10584	18.38	9485	19.34	10034	18.90
4	Lime	438	0.76	678	1.38	558	1.05
5	Labour charges	2563	4.45	1399	2.85	1874	3.53
6	Fuel and electricity charges	9474	16.45	8591	17.51	9032	17.01
7	Miscellaneous	1785	3.10	1125	2.29	1562	2.94
8	Interest on working capital @ 8%	2473	4.29	1943	3.96	2147	4.04
	Sub total	32241	56.13	26229	53.63	28996	54.28
	Total cost of production (I+II)	57579	100	49042	100	53071	100

Table 2. Returns of fresh water fish production in selected districts of North Karnataka (30 x 30m pond/year)

Sl. No.	Particulars	Districts		(Rs./pond/year)
		pooled (n=60)		
		Belagavi (n ₁ =30)	Dharwad (n ₁ =30)	
1	Total cost	57579	49042	53071
2	Yield (kg)	1400	1000	1200
3	Price per Kg (Rs.)	65	65	65
4	Total returns (Rs.)	91000	65000	78000
5	Net returns (Rs.)	33512	15958	18429
6	Benefit Cost Ratio (BCR)	1.58	1.32	1.46
7	Cost of production (Rs./Kg)	41.12	49.04	44.22

observed that 1.46 indicates that more returns for each rupee invested in the fish production in the study area [9,10]. "The total cost involved for production for 1 kg of fish in Belagavi district was Rs. 41.12 and in Dharwad district was Rs.49.04. On an average total cost involved for production of 1 kg of fish was Rs.44.22" [11 &12]. Thus it clearly indicates that net returns and yield obtained in Belagavi was higher compared to Dharwad district. This could be due to usage of good quality fingerlings, level of input

application, management and care by the farmers towards fish production in Belagavi district.

4. CONCLUSION AND RECOMMENDATION

The study underscores the profitability of freshwater fish farming in North Karnataka, with Belagavi district demonstrating higher returns and cost efficiency compared to Dharwad district.

The findings offer guidance to farmers on cost-efficient practices, emphasizing optimal input utilization, effective management of fixed and variable costs, and the adoption of innovative production techniques. The analysis points towards the driving forces behind cost disparities and the role of input quality, management strategies, and market dynamics. Further research could delve into identifying best practices and innovation approaches for cost reduction and enhanced profitability in fish production in the selected districts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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