

Prediction Modeling for Fish Farming of Some Selected Farms during 2014-'15 at Darbhanga District of Bihar

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ABSTRACT: This paper examines the costs and returns and other factors affecting fish production. The costs and returns analysis indicated that, variable cost, total cost of fish production in the study area, fixed cost. In order to utilize the available aquacrops of Darbhanga region for better economic returns, the following technologies could be made use of for developing location-specific packages and their subsequent transfer to the actual users, optimum utilization of ponds and tanks of the region through semi intensive and extensive culture of Fish. It is predominantly a cooperative and lucrative venture and does not necessitate higher education and specialized training but proper management and monitoring including regular monitoring of fish survivability. The state has immense natural aquatic resources in the forms of ponds and tanks where quality fish seed are required for good fish production.

KEY WORD: Econometrics, Sustainable development, livelihood generation, fisherfolk, Production.

I. INTRODUCTION

The pattern of global trade for cultured Fish thus presents a one way-flow, from developing tropical producer's countries to the three main markets in the developed world (FAO, 2013). India is the second largest producer of fish in the world contributing 5.68% of global fish production (FAO, 2014). India is also a major producer of fish through aquaculture and ranks second in the world after China. The total fish production during 2013-14 is at 9.579 million metric tonnes with a contribution of 6.136 million metric tonnes from inland sector and 3.443 million metric tonnes from marine sector respectively (FAO, 2013). The scenario of Bihar is given on chronological base. In 2004-05, the production of fish in Bihar was 2.67 lakh tonnes. The fish production increased steadily thereafter and touched the peak of 4.00 lakh tonnes in 2012-13. During the last two years, the production has been of the order of 3.44 lakh tonnes in 2011-12 and 4.00 lakh tonnes in 2012-13. Bihar has a span of 237.3 thousand hectares of water area and 3200 km of river length. This constitutes about 3.9 percent of the total geographical area (Government of Bihar Finance Department Economic Survey 2013).

II. MATERIALS AND METHODS

The study was conducted of Darbhanga district in Bahadurpur Block (latitude 26.1000511° N, longitude 85.9110475°E) A sample of 5 fish farmers was randomly selected from one block (Darbhanga Block) areas of Darbhanga district State (Bihar). Data was collected in 2014-'15 production season through administration of a questionnaire to the fish farmers. Analysis of the data was done using descriptive statistics and budgeting technique. The analysis revealed that land, water, labour and capital were the main resources employed in fish production. Data

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collection were made by two ways; firstly, collection of existing data (Secondary data) such as published literature, books, research articles and maps etc. of institutions. Secondly, present status, current problems and related legislation were collected from the literature survey. The collection of new data by filling of questionnaires is carried out. The collected data were statistically analyzed through SPSS 13.0 and R 2.14.2.

III. RESULT AND DISCUSSIONS

The present dissertation throws some light towards identification of important input variables, threats and the required management for the extensive of Fish culture. This culture long period of time, it giving late production profit, less risk in carp culture. 11 % of the farmers adopted Fish farming as their major source of income. this as their side income followed by 9% with agriculture and 3% fish farmers doing other business. While capital cost it clearly shows the maximum value Rs. 84,643 having an average value of Rs. 56812.70 , Concise Analytical Discussion for Average Economics (unit 1bigha) in connection with from (Table 1 & 2) Capital Cost for Fish Farming considering all the involved parameters during 2014-'15, over all Block .

Capital Cost = 79,747.662+ (-1.413) Construction + (-5.050) pump house cum workshop+ .349 X Land & farm equipment +1.137(*) Miscellaneous

(Table 1 & 2) Variable Cost it clearly shows that during 2014-'15, Darbhanga Block shows the maximum value (Rs. 2,93,936) and Darbhanga Block shows the minimum value (Rs 2,32,938) . This is mainly due to hike of prices in the subsequent periods. The statistical variation is moderate within the year, standard deviation and standard error being 21646.9204 and 6845.35729 in the respective Block. Concise Analytical Discussion for Average Economics (unit 1bigha) in connection with Variable Cost for Fish Farming considering all the involved parameters during 2014-'15, over all Block

Total variable Cost = 101088.052 + 15.122 Water accumulation cost +.921 cost of feed + (-3.69)Annual maintinace & 8.repairing cost +(-1.678) Miscellaneous expenditure

Fixed costs which are in nature and in most of the time not calculated by the farmers during their economic analysis. It clearly shows that the overall inter year average value is slight higher in the Block during 2014-'15, in Darbhanga Block shows the maximum value (Rs. 43,078.66). during 2014-'15, Darbhanga Block shows a minimum value (Rs. 16,655.73) having an average value of Rs. 40297.81. Concise Analytical Discussion for Average Economics (unit 1bigha) in connection with Fixed Cost for Fish Farming considering all the involved parameters during 2014-'15, over all Block .

Total Expenditure = - 19.052 Depreciation on Capital Cost + 10.087 Total Fixed Cost

(Table 1 & 2) Income sole important factor upon which the business stability depends. A 100% technically efficient farm will lie on the frontier and it produces maximum possible output using all the resources in an optimal way (Mishra.N, 2007). Concise Analytical Discussion for Average Economics (unit 1bigha) with different Factors related to the Income of Fish Farming considering all the involved parameters during 2014-'15, over all Block.

Total income = .233+0.005 survivability + (-617.006)* Total Biomass

Profit/ Loss clearly shows Darbhanga Block shows the maximum value Rs. 246,198.09 Similarly, in the case of inner year comparison among the Block, Darbhanga Block shows a minimum value (Rs. 99,860.5) having an average value of Rs. 55796.67. Concise Analytical Discussion for Average Economics (unit 1bigha) in connection with Total Income and Profit of Fish Farming considering all the involved parameters during 2014-'15, over all Block.

Profit = -406538.930+ 8.587 Capital Cost+ -1.394 variable cost + 1.084 Total Income

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From the Principal Component Analysis (Extraction Method) among different costs and Net Profit for both 2011 and 2012, it depicts that the major factors are Capital cost and Variable cost to explain the variation for net profit (Table 1 & 2).

Table 1: Average Economics of Fish Farming at Darbhanga block during 2014-'15: Schedule Depicted on Average Farm Size of 1,333.33 m²(1.0 Bigha) at Darbhanga district of Bihar(India)

Sl. No.	Particulars	2014
I.	Expenditure	1 BIGHA
A.	Capital Cost (C.C.)	
1.	Lease amount/1year	14,682
2.	Construction of ponds	16,821
3.	Inlet and outlet structure of pond	2,148
4.	Pump house cum workshop	2,892
5.	Watchman shed	2,768
6.	Pumps	3,421
7.	Electric installation with electrification	2,218
8.	Land and farm equipments (including maintenance charge for all machineries)	2,160
9.	Miscellaneous	2,852
	Total Capital Cost (TCC) (Rs.)	49,962
B.	Variable Cost (V.C.)	
1.	Water accumulation cost	1,567
2.	Chemicals and manure	1,126
3.	Cost of seeds	22,565
4.	Cost of feed	1,87,197
5.	Fuel charges	2,134
6.	Electricity charges	1,272
7.	Labour charges	68,163
8.	Medicines	2,378
9.	Annual maintenance and repairing cost	3,037
10.	Miscellaneous	2,128
	Total Variable Cost (TVC) (Rs.)	291,567
C.	Fixed Cost (F.C.)	
1.	Depreciation on capital cost @ 10%	4996.2
2.	Interest on capital cost @ 11%	5,495.82
3.	Interest on variable cost @ 11%	32,072.37
	Total Fixed Cost (TFC) (Rs.)	42,564.39
	Total Expenditure (TVC+TFC) (Rs.)	334,131.39
II.	Income	
Cal cula tion (Steps)	Average stocking density (no/m ²)	4
	Number of species	10000
	Average survivability @	68
	Total number of species survive	6800
	Average body weight (gm)	0.553
	Total biomass (Kg)	3,760.4
	Average selling price (Rs.)	123.75
	Total Income (Rs.)	465,349.5
III.	Profit/Loss	131,218.11

Table 2: Correlation Matrix for Average Economics (unit 1 bigha) comprising all the fish farms in connection with Profit during 2014-15, over all Village

	Capital Cost	Variable Cost	Fixed Cost	Total Expenditure	Total Income	Profit
Capital Cost	1					
Variable Cost	.599	1				
Fixed Cost	.792	.963	1			

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Total Expenditure	.626	.999(*)	.972	1		
Total Income	-.749	-.979	-.998(*)	-.986	1	
Profit	-.660	-.997	-.981	-.999(*)	.992	1

* Correlation is significant at the 0.05 level (2-tailed).

IV. CONCLUSION

Fish farming is predominantly a cooperative and lucrative venture and does not necessitate higher education and sophisticated training, but requires proper management and monitoring including that of fish survivability. The state has immense natural aquatic resources in the forms of ponds and tanks where quality fish seed are required for good fish production. Towards the development of this sector, it needs an elusive concept towards mobilization of natural resources, augmentation of trained manpower, capital and technical knowhow and their utilisation for attainment of constantly multiplying national goals, higher living standards and the change over from a traditional to a modern society. The essence of development is generally perceived as industrialisation and modernisation. Moreover, development is a multi-dimensional and multi-linear process. From the analysis it is clearly evident. Government should take initiatives and concentrate the focus upon the matter.

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BIOGRAPHY



Dr. Somen Sahu completed B.Sc. Honours in Statistics from Ramkrishna Mission Residential College, Narendrapur (Calcutta University) in 1991, Post-graduated in Statistics from Burdwan University in 1993, M.B.A. from National Institute of Personnel Management in 1995 with Gold Medal. He completed his Ph.D. from Jadavpur University in 2006. He was a National Scholar. He published number of articles in National & International Journals, and edited and contributed to several significant publications. His areas of interest are Bio-Statistics, Statistical Software Handling, Biomonitoring, Management Information System and Extension Education in different Agricultural fields. He introduced a new Model viz. Dr. Sahu's Networking Model which was adopted by Department of Fisheries, Government of West Bengal. He is the founder Secretary of International Organisation of Biological Data Handlers. He has life membership with various scientific & professional societies & organizations He is currently working as an Associate Professor and Head in the Department of Fishery Economics and Statistics, Faculty of Fishery Sciences, West Bengal University of Animal and Fishery Sciences, Kolkata for last 15 years.