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A Study on Fish Production of Different Size of Fish Farm Groups in Prayagraj District, Uttar Pradesh

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Uttar Pradesh is India's most populous state having 1662 lakh population as per 2001 census, against 16.2% of India's population with enough fisheries resources in the form of community ponds, tanks with dominance of rivers and man-made reservoirs. Five blocks (Koraon, Shankargarh, Karchhana, Handia, and Jasara) from Prayagraj were taken for study during the period of 1st December,2020 - 31st May,2021.
Aim: To examine the fish production of different size of fish farm groups.
Methodology: A study was conducted in the Prayagraj district of Uttar Pradesh. A total of 80 fish farmers were selected randomly from five blocks (Koraon, Shankargarh, Karchhana, Handia, and Jasara) and a pre-structured questionnaire was used to collect the data from the fish farmers. The fish farmers were classified into three categories on the basis of the size of pond area viz. small farmer: up to 0.125 ha., medium farmer: 0.125 ha to 0.250 ha., and large farmer: above 0.250 ha.
Result: The Study showed that, various independent variables of production like fingerlings, manures, feeds, and labor were being analysed in accordance with their respective sample of fish ponds and it is concluded that all of the independent variables affected the fish production differently. Using Cobb Douglas production function, 73% variation in gross value return from explanatory variables was observed in first size-group. Effect of Improved variety fingerlings was negative and coefficient of elasticity for human labor was positive but both impacted fish production significantly. A variation of 41.6% in gross value return was observed from second size group.

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Human labor impacted fish production significantly and its coefficient of elasticity was positive. Further, 45.7% of variation in gross value return was in third size group. Human labor and manure both had a significant effect, and their coefficients of elasticity was positive and negative respectively. Coefficient of multiple determination R^2 was 76.6% indicating variation in gross value return from independent variable from all farm's situations. Pond area and human labor variables had positive coefficient of elasticity but for improved fingerlings it was negative and all effected fish production significantly.

Conclusion: It was concluded that there is a need to further engage the fish farmers in the fish production practices and provide them with sufficient inputs of production like fingerlings, manures, feeds, and labor so that the farmers can boost the fish production in the study area.

Keywords: Area of pond (ha.); expenses on fingerlings; expenses on manuring; expenses on feed; fish production; size groups of fish farms.

1. INTRODUCTION

Fisheries in India is considered as an allied economic activity with a wide potential. The Fisheries Sector is basically a Greenfield Sector. After China, India stands at second position in terms of fish production and aquaculture in the world. Fisheries Sector provides direct employment and livelihood to around 16 million people and an indirect employment to many others and has a crucial role in the Indian Economy. Fish production has expanded from 5.66 MMT in 2000-01 to 12.61 MMT in 2017-18 that includes 8.92 MMT from inland fisheries and 3.69 MMT from marine fisheries [1].

The total fisheries potential of India has been estimated at 22.31 million metric tons (in 2018), of this, the marine fisheries potential stands at an estimated 5.31 million metric tons and the inland fisheries potential has been estimated at 17 million metric tons [2].

Looking at the previous studies and research done, we can observe that only 48.97 percent of available aquaculture resources were utilized for fish production in the state of Uttar Pradesh suggesting the need to expand the fish production Maurya et al. [3]. Another study in the state of Punjab in Ludhiana reveals that inland fish production was higher than marine fish production during the last three decades and the quantity of fish exports increased more than 14 times [4-13]. Also, the results of significance confirm the factors like area, labor cost and marketing cost and how various fish farmers are confronting various issues like fish diseases, flooding, poaching practices, less subsidy, poor or inadequate infrastructure, which needs to be resolved (Kaur 2017)

So, a brief view at the past literature show that there is a vast scope of fisheries sectors and various challenges are associated with it that needs to be addressed to make this a flourishing sector in the allied agricultural activities.

There is a large scope of fish production in Prayagraj districts given that the resources are efficiently utilized in the area and hence this study is carried out to examine the fish production with the various input of fish production.

2. MATERIALS AND METHODS

Prayagraj district of Uttar Pradesh is selected for study since the district is having high fish production. Five blocks (Koraon, Shankargarh, Karchhana, Handia, and Jasara) have been taken under study. A total of 80 fish farmers were selected by random sampling technique.

2.1 Sampling Design

A multistage random sampling technique is used to select development blocks, villages and ultimately fish farmers.

2.2 Selection of District

Uttar Pradesh comprises of 75 districts. Out of which Prayagraj district is selected purposely.

2.3 Selection of Development Block

Prayagraj district comprises of 20 blocks out of which Koraon, Shankargarh, Karchhana, Handia and Jasara are selected randomly.

2.4 Selection of Villages

For sampling, a complete list of villages having fishponds is procured from the CDO (Chief

Table 1. Regression coefficients of logarithmic value for fish production by different size-group of fish farmers

Size-group of Fish Farmers	Explanatory Variables					
	Pond Area (X1)	Human Labor (X2)	Improved Variety Fingerlings (X3)	Manure (X4)	Feed (X5)	R^2
Upto 0.125 ha.	-	0.758* (3.859)	-0.340*** (-1.620)	0.079(0.428)	0.287(1.018)	0.73
0.125 to 0.250 ha	0.259 (1.010)	.528* (3.150)	-0.179(-0.918)	0.003(0.017)	0.078 (0.336)	0.416
Above 0.250 ha.	0.168 (0.659)	0.634** (2.473)	0.008 (0.025)	-0.395*(-2.874)	-0.298 (-0.898)	0.457
Overall Size-group	0.398***(1.615)	1.095* (5.689)	-0.378*** (-1.465)	-0.071 (-1.199)	-0.239 (-0.933)	0.766

*Figures mentioned in enclosure denote 't' value; * indicates 1 percent level of significance; **indicates 5 percent level of significance; *** indicates 20 percent level of significance*

Development Office) office of sample block. 54 villages are taken for study out of which 10 percent of the farmers are selected randomly. Haldia, Karchana and Jasara have 9,14 and 11 villages whereas Karaon and Sankargarh have 10 villages each.

2.5 Selection of Fish Farmers

A list of fish farmers is prepared for collection of data and the total number of identified ponds were 80. fish farmers are further grouped based on their pond area as follows-

1. Small farmer: Up to 0.125 ha.
2. Medium farmer: 0.125 ha to 0.250 ha.
3. Large farmer: Above 0.250 ha.

2.6 Cobb-Douglas Function

Cobb-Douglass Production Function has been applied to analyse resource productivity in fish production. Cobb-Douglas production function used in this study is of the following form:

$$Y = ax_1^{b_2}.\, x_2^{b_2}\ldots\ldots\ldots\ldots x_n^{b_2}$$

Where

Y= Fish production
a = Functional coefficient (constant)

x_i = Value of i^{th} input factor

b_i = coefficient of elasticity of production of i^{th} input factor.
n = Total number of input factors (independent variables)
and i = 1, 2, ... n

2.7 Selection of Input Factors

Total production is influenced by several factors. Some of the factors like pond area, expenses on fingerlings, human labor, expenses on feed and expenses on manuring were selected as independent variables. They are denoted below;

X1 = Area of Pond (ha.)
X2 = Total Human Labor (Days)
X3 = Expenses on Fingerlings (Rs.)
X4 = Expenses on Manuring (Rs.)
X5 = Expenses on Feed (Rs.)

For Regression analysis, logarithmic form of production function was used and the regression equation was estimated using Cobb- Douglas function. Their estimates and corresponding R^2 values are mentioned in the Table 1.

3. RESULTS AND DISCUSSION

R^2 in first size group was 0.73 showing that there is 73% variation in gross return value by independent variables viz, X1 = Area of Pond (ha.), X2 = Total Human labor, (Days), X3 = Expenses on Fingerlings (Rs.), X4 = Expenses on Manuring (Rs.), and X5 = Expenses on Feed (Rs.). As observed from the table we can conclude that in first size group (up to 0.125 ha), expenditure on improved variety fingerlings was negative and had a significant impact on income. Thus, we can say that use of improved variety fingerlings (X3) impacted fish production significantly. Further, expenditure on feed had a non-significant impact on income, thus, it is inferred that better feed (X5) may not give better income.

The value of coefficient of multiple determination R^2 was 0.416 for second size group. This indicates that 41.60% of variations in gross value return was from independent variables. In case of second size group, expenditure on better feeding and improved variety fingerlings has a non-significant impact on income. Thus, usage of improved variety fingerlings impacted income from fish production significantly, whereas better yield from better feeding in terms from fish production may not give better returns to income.

R^2 value in third size group in fish production was 0.457 indicating that 45.70% of variations from gross value return was from independent variable in the equation. Expenditure on better feed and improved variety fingerlings impacted income non-significantly.

R^2 from all farms was 0.766 indicating that 76.60% variation in gross value return was from independent variable. Expenditure on improved variety fingerlings in overall size group was negative and had a significant impact on income. Thus, use of improved variety fingerlings has a significant impact on fish production. Expenditure on better feed in overall size group had a non-significant impact on income. Thus, better feed gives better yield in income from fish production may not add returns to the income.

4. CONCLUSION

On analysis using Cobb-Douglas production function it was found that in first size-group the explanatory variables explained 73 percent of variations in the value of gross return. The coefficient of elasticity for human labor was positive while that for improved variety fingerlings was negative and both had significant effect on fish production. In second size-group 41.60 percent of variations in the value of gross return was explained by the considered variables. The coefficient of elasticity for human labor turned out to positive and effect on fish production was the significant. In third size-group the explanatory variables explained 45.70 percent of variations in the value of gross return. The coefficients of elasticity for human labor and manure turned out to be positive and negative respectively and both had significant effect. For all farm's situation analysis to the value of the coefficient of multiple determination R^2 indicates that 76.60 percent of variations in the value of gross return was due to considered independent variables. The coefficients of elasticity for pond area and human labor were positive and that for improved variety fingerlings was negative but all had significant effect on fish production. Thus, fish production in the district registers an increasing trend but there are ample opportunities to cover the additional area for increasing the fish production.

For boosting the fish production in the area government should come forward with adequate policies for strengthening infrastructures such as seed and feed supply system, proper transport and communication, adequate cool chain arrangements during transport and storage, multiagency financial arrangements etc.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ministry of Fisheries, Animal Husbandry and Dairying, Department of Fisheries Standing Committee on Agriculture Report, 2019-2020.
2. National Fisheries Policies 2020 Report.
3. Maurya AK, Upadhyay AD, Khan S. Trend analysis of fish production in Uttar Pradesh, India. 2018;6(4): 180-184.
4. Goswami C, Zade VS. Statistical analysis of fish production in India. International Journal of Innovative Research in Science, Engineering and Technology. 2015;4(2):294-299.
5. Haryana Kisan Ayog, Hisar, Government of Haryana. Working Group Report on Fisheries Development.2012.
6. Islam MS, Jahan H, Abdullah Al-Amin AKM. Fisheries and aquaculture sectors in Bangladesh: an overview of the present status, challenges and future potential. Journal of Fisheries and Aquaculture Research. 2016;1(1):2-9.
7. Kumar GB, Datta KK, Joshi PK. Growth of fisheries and aquaculture sector in India: Needed policy directions for future. World Aquaculture. 2010;41(3):45-51.
8. Kummari S, Prakash B, Mamidala SP, Daggula N, Suresh G. Opportunities and prospects of inland freshwater aquaculture in Telangana: a step towards blue revolution. Journal of Entomology and Zoology Studies. 2018;6(3):314-319.
9. Saini R. Jhajjar to have North India's first ornamental fish hatchery. 2017.

   Accessed 5 December 2017

   Availablehttps://www.tribuneindia.com/news/archive/haryana/jhajjar-to-have-north-india-s-first-ornamental-fish-hatchery-508720.
10. Saravanan S. A study on production and export performance of fisheries sector in India. International Journal of Applied Research. 2015;1(13):71-73.
11. Sarin J. Fish farming a better proposition than growing wheat-paddy crops. The Weekend Leader.2017;8(22).
12. Singh DR, Vasisht AK, Kumar S. Profitability and technical efficiency of aquaculture in Punjab, India. Indian Journal of Fisheries.2015:62(2); 49-55.

13. Sree Vyshnavi PV, Venketa Rao P. Importance of marine fisheries in Indian economy. International Journal of Applied Science Engineering and Management. 2016;2(10): 68-83.

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