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Research Article

IMPACT OF TRADITIONAL PISCICULTURE ON HOUSEHOLD INCOME AMONG TRIBAL FISHERMEN AT ARSHA DEVELOPMENT BLOCK PURULIA DISTRICT: A STATISTICAL MODELING

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ABSTRACT

The study was carried out for a period of 5 months with the objectives to know the socio-economic condition of involved fishermen and find out some possible suggestions to uplift the livelihood status of local fishermen. The collection of data was done by survey method using well structured questionnaires, PRA and interviewing with fishermen. For the overall planning, and development and implementation in fisheries sector, it is necessary to have the sound knowledge about the livelihood pattern of the related people. Relatively in any practical field, socio-economic condition illustrates the present status, standard of living and economic condition of the people. In fact income earning activities as an outcome of socio-economic pattern which are affected by the community environment, is one of the most obvious issue that had not been conducted in the area. So in this respect, this study is very much important.

INTRODUCTION

Fish and fisheries is an important sector of most of the developing and developed countries of the World from the stand point of income and employment generation. Like any other countries of the world, rivers, reservoirs and aquaculture are the main sources of inland fisheries in India also.

Economically, the fishes constitute a very important group of animals. About 5.38 million people are dependent on fishing in India, of which about 3.28 million people live along the coast line with the rest on lakeside or river banks or near backwaters (2nd citizen's report, 1984-1986). Besides being used as a food it provides by-products of various kinds such as fish liver is an important source of oil and has medicinal values which are used for the treatment of different diseases. Fishes also provide fish fertilizer fish manure and several other products. Fishes have a great nutritive value and due to this, fishes are consumed in abundance not only in India but all over. In most part of the World, fish production is mainly from the wild. As the world population grows, fish resources are being depleted at an increasing rate as a result of environmental degradation, over harvesting and pollution, thus fish production could no longer meet the demand of the growing population. This had led an increase in the involvement of stakeholders in aquaculture. This method has also been plagued by the problems of overcrowding, poor environmental conditions and pollution which often result in reduced immunity of fish and higher susceptibility to parasites and diseases.

Fishermen contribute a lot in our economy. So improvement of their social life and economic condition is very important in context our national economic development. And for that proper management of capture fisheries should be done properly. Fishermen villages are mostly located in inaccessible areas, where there is little communication and developmental or social impact. There is no denying the fact that fishermen and fishing community as a whole the poorest and most disadvantaged group of Purulia. They have no other income generating activities except fishing, which cannot be carried out throughout the year and in idle periods, they lack alternative employment opportunities. Their socio-economic development is negligible. Hence it is essential to know the livelihood status of fishermen. For the overall planning, and development and implementation in fisheries sector, it is necessary to have the sound knowledge about the livelihood pattern of the related people. Relatively in any practical field, socio-economic condition illustrates the present status, standard of living and economic condition of the people. In fact income earning activities as an outcome of socio-economic pattern

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which are affected by the community environment, is one of the most obvious issue that had not been conducted in the area. So in this respect, this study is very much important.

MATERIALS AND METHODS

The present study is based on an intensive fieldwork conducted in Arsha block of Purulia district, West Bengal during the months of February 2017 to July 2017. Before the commencement of fieldwork, a pilot study was conducted during the month of January 2017. Based on that pilot study, Arsha block of Purulia district were selected for final study. Purposive sampling method was used while selecting the study area. Purulia came into force as a district of West Bengal in 1956. Purulia is the western-most district of West Bengal with an all-India significance because of its tropical location, its shape as well as function like a funnel. It funnels not only the tropical monsoon current from the Bay to the subtropical parts of north-west India, but also acts as a gateway between the developed industrial belts of West Bengal and the hinterlands in Orissa, Jharkhand, Madhya Pradesh and Uttar Pradesh. This district is between 22^{o} 42'35" and 23^{o} 42'0" north latitude and 85^{o} 49'25" and 86^{o} 54'37" east longitude. Midnapore, Bankura and Burdwan district of West Bengal and Dhanbad, Bokaro, Hazaribagh, Ranchi, West Singbhum, East Singbhum district of Jharkhand State bound this district. The total geographical area of the district is 6259 sq. kms. Out of which the Urban and Rural areas are 79.37 sq. kms (1.27%) (Municipalities & Non-Municipalities) and 6179.63 sq. kms (98.73 %) respectively. Physiographically, Purulia, the westernmost district of West Bengal, is well known as a drought prone district and falls within the semi-arid region of the state. Cultivation of this district is predominantly mono-cropped. Out of total geographical land 52.47 % are used for agriculture. 29.69 % are under forest coverage (including social forestry) and 10.15 % are identified as Wasteland. Soil erosion is the most prominent phenomenon of the district resulting huge deposition of fertile soil in the valley region. Vast areas of land remained uncultivable wasteland. Out of the total agricultural holding about 73 % belongs to small and marginal farmers having scattered and fragmented smallholding. About 90 % of the population lives in villages and about 44 % of the rural population is below poverty line. As per 2001 census total population of the district is 2535516, out of which 89.93 % are residing in rural areas and 10.07% are in urban areas. About 51.18 % of the populations are males and 48.82% are female. The percentage of Scheduled Caste and Scheduled Tribes are 18.29% and 18.27%. Total no of BPL families in rural areas of this district are 197381 (43.65 %). Out of which SC families are 40645 (20.59 %) and ST families are 47666 (24.15 %). Total no. of BPL families in Purulia and Jhalda Municipality are 2573 (11.31 %) and 571(15.98 %) respectively (District Statistical Handbook, 2013. Bureau of Applied Economics & Statistics, Purulia, Govt. of West Bengal) Researchers rarely survey the entire population because the cost of a census is too high. The three main advantages of sampling are that the cost is lower, data collection is faster, and since the data set is smaller it is possible to ensure homogeneity and to improve the accuracy and quality of the data. Sampling is concerned with the selection of a subset of individuals from within a population to estimate characteristics of the whole population which is homogeneous in nature. Sampling is the process of selecting units likes people, organizations from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen. Using random sampling method around 50 tribal fisher folk were selected for final study.

RESULT AND DISCUSSION

Concise Analytical Discussion for Average Economics (unit 1,333.33m^2) in connection with Total Output for tribal Fish Farming considering all the involved parameters over Arsha Dev. Block under Traditional fish Culture

From (Table 1) it depicted the bivariate inter-correlation among all the variables (average value calculated for 1,333.33m^2 area, in all the cases) viz. stocking, transport, raw cow dung, liming, feeding, labour charge, harvesting cost, total input and total output under consideration.

Firstly, considering the correlation between Stocking with other variables, there exist a significant high positive correlation with Transport (Seed, Feed, Manure etc.), low positive correlation with Labour charge and Harvesting cost, high negative correlation with Feeding, moderate negative correlation with Raw cow dung, low negative correlation with Liming, total output and Total output

Secondly, considering the correlation between Transport (Seed, Feed, Manure etc.) with other variables, there exist a significant low positive correlation with Labour charge, high negative correlation with Feeding, moderate negative correlation with Raw cow dung and Total input, low negative correlation with liming, Harvesting cost and Total output.

Thirdly, considering the correlation between raw cow dung with other variables, there exist a significant high positive correlation with liming, moderate positive correlation with feeding, harvesting cost, total input and total output, low positive correlation with labour charge.

Fourthly, considering the correlation between liming with other variables, there exist a significant low positive correlation with feeding, total input and total output, low negative correlation with labour charge and harvesting cost.

Fifthly, considering the correlation between feeding with other variables, there exist a significant moderate positive correlation with total input and total output, low positive correlation with labour charge and harvesting cost.

Sixthly, considering the correlation between labour charge with other variables, there exist a significant high positive correlation with harvesting cost, total input and total output.

Seventhly, considering the correlation between harvesting cost with other variables, there exist a significant high positive correlation with total input and total output.

Finally, considering the correlation between total input with other variables, there exist a significant high positive correlation with total output.

Table 1 Correlation Matrix for Average Economics (unit 1,333.33 m^2) comprising all traditional culture of Arsha Block in connection with Tribal Fish Farming.

	Stocking	Transport (Seed,Feed, Manure etc.)	Raw Cow Dung	Liming	Feeding	Labour Charge	Harvesting cost	Total Input	Total Output
Stocking	1								
Transport (Seed,Feed,Manure etc.)	.922(**)	1							
Raw Cow Dung	-.586	-.432	1						
Liming	-.370	-.090	.802(**)	1					
Feeding	-.885(**)	-.968(**)	.480	.061	1				
Labour Charge	.198	.023	.354	-.073	.154	1			
Harvesting cost	.117	-.054	.407	-.043	.230	.997(**)	1		
Total Input	-.365	-.464	.664(*)	.159	.633(*)	.829(**)	.871(**)	1	
Total Output	-.078	-.243	.505	.029	.417	.952(**)	.971(**)	.946(**)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

From (Table 2), The linear regression equation taking total input as dependent variable and other variables viz. stocking, transport, raw cow dung, liming, feeding and harvesting cost as independent variables. The equation revealed as below:

Total Input = -10500.000 +(2.250 x Stocking) + Transport (Seed, Feed, Manure etc.) + Raw Cow Dung + Liming + Feeding + (39.889 x Harvesting cost).

The equation clearly indicates that the most important variables (average value calculated for 1 bigha area, in all the cases) are stocking and harvesting cost. Both of them have positive impact upon total input. All the other independent variables have positive impact upon total input. The 95% Confidence Interval i.e. the lower and the Upper boundaries are depicted as: stocking (-10500.000, 10500.000), transport (-2.250, 2.250), raw cow dung (-1.000, 1.000), liming (-1.000, 1.000), feeding (-1.000, 1.000), harvesting cost (-39.889, 39.889).

Table 2 Coefficients Matrix for Average Economics (unit 1,333.33 m^2) comprising all traditional culture of Arsha Block in connection with Tribal Fish Farming

	Unstandardized Coefficients	95% Confidence Interval	
		Lower Bound	Upper Bound
(Constant)	-10500.000	-10500.000	10500.000
Stocking	2.250	-2.250	2.250
Transport (Seed,Feed,Manure etc.)	1.000	-1.000	1.000
Raw Cow Dung	1.000	-1.000	1.000
Liming	1.000	-1.000	1.000
Feeding	1.000	-1.000	1.000
Harvesting cost	39.889	-39.889	39.889

Dependent Variable: Total Input

From (Table 3), The linear regression equation taking total output as dependent variable and other variables viz. stocking, transport, raw cow dung, liming, feeding, harvesting cost and total input as independent variables. The equation revealed as below:

Total Output = -7350.465 + (11.266 x Stocking) + (-.434 x Transport, Seed,Feed,Manure etc.) + (-.374 x Raw Cow Dung) + (1.206 x Liming) + (.351 x Labour Charge) + (.599 x Total Input)

The equation clearly indicates the most important variables (average value calculated for 1 bigha area, in all the cases) are stocking and liming. Both of them have positive impact upon Total output. All the other independent variables viz. labour charge and total input have positive impact upon total output, transport and raw cow dung have negative impact upon total output. The 95% Confidence Interval i.e. the lower and the Upper boundaries are depicted as: stocking (-37.432, 59.964), transport (-1.620, .751), raw cow dung (-7.416, 6.667), liming (-5.040, 7.451), labour charge (-2.582, 3.285), total input (-.660, 1.858).

Table 3 Coefficients Matrix for Average Economics (unit 1,333.33 m^2) comprising all traditional culture of Arsha Block in connection with Tribal Fish Farming

	Unstandardized Coefficients	95% Confidence Interval for B	
		Lower Bound	Upper Bound
(Constant)	-7350.465	-84426.801	69725.871
Stocking	11.266	-37.432	59.964
Transport (Seed,Feed,Manure etc.)	-.434	-1.620	.751
Raw Cow Dung	-.374	-7.416	6.667
Liming	1.206	-5.040	7.451
Labour Charge	.351	-2.582	3.285
Total Input	.599	-.660	1.858

Dependent Variable: Total Output

CONCLUSION

Fishermen contribute a lot in our economy. So improvement of their social life and economic condition is very important in context our national economic development. The study provides enough evidence that fish farming in Purulia is very productive and brings increased income among the fish farmers. Results of the study revealed that respondent farmers are earning a significant income from fish farming. It was also observed by the researchers that due to having better communication facilities in the study area ,fish farmers can easily send their harvested fish to the capital city, thus the respondent fish farmers are enjoying a better income security. The earning from fish farming is also contributing significantly to their household income which is ultimately improving the lives of the poor farmers. Thus, the farmers in the study area are increasingly adopting fish farming as a better choice for

their livelihoods. The findings of the study also identified the significant factors (i.e., age, pond size, training on fish farming and access to information on fish farming) can influence the income from fish farming significantly. Thus, these factors should be addressed properly to make fish farming more cost-effective. Thus, it can be concluded that through adopting fish farming farmers can improve their income in a sustainable manner that might be the key to mass reduction of poverty among the poor farmers in rural Purulia. However, the study also explored that farmers have training need on fish farming as they have limited access to information regarding fish production and marketing. From the survey it was also identified that many socioeconomic constrains exist in fishermen communities. So there is a necessity to manage and provide proper guidelines and training for the proper use of resources to improve their socioeconomic and livelihood status.

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