International Journal of Pure & Applied Bioscience

Poverty Eradication through Traditional Fishing Practice among Tribal Fishermen at Some Selected Regions of Purulia District: A Statistical Analysis

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ABSTRACT

Poverty eradication or poverty alleviation is a set of measures both economic and humanitarian, that are intended to permanently lift people out of poverty. A field study was conducted on the socio-economic conditions of fishermen in Purulia District. 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. Socio-economic condition of tribal fishermen communities were presented in terms of, age group, religion, marital status, family type, condition of house, educational status of the fishermen, number of family members, school going children, school dropout children, household assets, use of electricity, occupation, sanitation, agricultural land, yearly income and expenditure, ownership of the domestic animals, source of drinking water, medical treatment, and loan etc. 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 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. Fishermen suffered many problems in this study area. So there is a necessary to manage and proper guideline for the proper use of resources by community people to ensure their livelihood pattern.

Key words: *Traditional Fishing, Tribal Fishermen, Poverty alleviation, Econometrics. Purulia*

INTRODUCTION

Fish and fishery resources play a vital role in improving socio-economic conditions of the fishermen and related people those are involved with its business. It also plays important role of employment opportunities in Purulia as well as West Bengal also. 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 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. Therefore proper fishery management policies, effective input supply, technical and social support may improve the livelihood of the fishers which will ultimately increase the overall fisheries productivity of Purulia district as well as West Bengal. The fishermen communities have been affected socio-economically from the very past and there are no alternatives for them. In general, efforts were made to the review relevant literatures on the socio-economic aspects of the fishermen communities and change in the impacts of environment and fish production in the Purulia district. Studies on the socio-economic aspects of fishermen though not very rare, with respect to the problem they are faced with, however the situation arising out all over the country.

MATERIAL AND METHODS

The present study is based on an intensive fieldwork conducted in Arsha & Bagmundi blocks 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 2014. Based on that pilot study, Arsha & Bagmundi blocks 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)

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 $1,333.33 m^2$) in connection with Total Output for tribal Fish Farming considering all the involved parameters over Arsha Dev. Block under Traditional fish Culture.

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 1) it depicted the bivariate inter-correlation among all the variables (average value calculated for $1,333.33 m^2$ 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 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 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 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

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).

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 Bagmundi Dev. Block under Traditional fish Culture.

Table 4: Correlation Matrix for Average Economics (unit 1bigha) comprising all traditional culture of Bagmundi 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.)	.904(**)	1							
Raw Cow Dung	-.300	-.640	1						
Liming	-.269	-.307	.530	1					
Feeding	-.627	-.688	.261	-.164	1				
Labour Charge	.141	-.024	.449	-.041	.016	1			
Harvesting cost	.780(*)	.629	.101	.003	-.456	.672	1		
Total Input	.440	.283	.032	-.536	-.033	.532	.475	1	
Total Output	.289	.201	.315	.259	-.134	.845(*)	.815(*)	.237	1

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

From (Table 4) it depicted the bivariate inter-correlation among all the variables (average value calculated for 1 bigha 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, moderate positive correlation with harvesting cost and total input, low positive correlation with labour charge and total output, moderate negative correlation with feeding, low negative correlation with raw cow dung and liming.

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

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

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

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

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

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

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

Table 5: Coefficients Matrix for Average Economics (unit 1bigha) comprising all traditional culture of Bagmundi Block in connection   with Tribal Fish Farming

	Unstandardized Coefficients	95% Confidence Interval for B	
		Lower Bound	Upper Bound
(Constant)	-71392.59	-71392.59	71392.59
Stocking	299.81	-299.81	299.81
Raw cow dung	-60.97	-60.97	60.97
Liming	153.11	-153.11	153.11
Feeding	8.80	-8.80	8.80
Labour charge	59.97	-59.97	59.97
Harvesting cost	-1996.19	-1996.19	1996.19

Dependent Variable: Total Input

From (Table 5), The linear regression equation taking total input as dependent variable and other variables *viz.* stocking, raw cow dung, liming, feeding, labour charge and harvesting cost as independent variables. The equation revealed as below:

Total Input = -71392.59 + (299.81 x Stocking) + (-60.97 x Raw Cow Dung) + (153.11 x Liming) + (8.80 x Feeding) + (59.97 x Labour charge) + (-1996.19 x Harvesting cost).

The equation clearly indicates the most important variables (average value calculated for 1 bigha area, in all the cases) are stocking and harvesting cost, where stocking has positive impact upon total input and harvesting cost has negative impact upon total input. All the other independent variables *viz.* liming, feeding and labour charge have positive impact upon total input and raw cow dung has positive impact upon total input. The 95% Confidence Interval i.e. the lower and the Upper boundaries are depicted as: stocking (-299.81, 299.81), raw cow dung (-60.97, 60.97), liming (-153.11, 153.11), feeding (-8.80, 8.80), labour charge (-59.97, 59.97), harvesting cost (-1996.19, 1996.19).

Table 6: Coefficients Matrix for Average Economics (unit 1bigha) comprising all traditional culture of Bagmundi Block in connection   with Tribal Fish Farming

	Unstandardized Coefficients	95% Confidence Interval for B	
		Lower Bound	Upper Bound
(Constant)	9724.046	9724.046	9724.046
Stocking	-12.726	-12.726	12.726
Raw cow dung	.041	-.041	.041
Liming	-2.835	-2.835	2.835
Feeding	-.119	-.119	.119
Labour charge	-1.331	-1.331	1.331
Harvesting cost	105.147	-105.147	105.147

Dependent Variable: Total Output

From (Table 6), The linear regression equation taking total output as dependent variable and other variables *viz.* stocking, raw cow dung, liming, feeding, labour charge and harvesting cost as independent variables. The equation revealed as below:

Total Output = 9724.046 + (-12.726 x Stocking) + (.041 x Raw Cow Dung) + (-2.835 x Liming) + (-.119 x feeding) + (-1.331 x Labour Charge) + (105.147 x harvesting cost.

The equation clearly indicates the most important variables (average value calculated for 1 bigha area, in all the cases) are stocking and harvesting cost, where harvesting cost is positive impact upon Total output and stocking is negative impact upon Total output. All the other independent variables *viz.* liming, feeding and labour charge have negative impact upon total output and raw cow dung has positive impact upon total output. The 95% Confidence Interval i.e. the lower and the Upper boundaries are depicted as: stocking (-12.726, 12.726), raw cow dung (-.041, .041), liming (-2.835, 2.835), feeding (-.119, .119), labour charge (-1.331, 1.331), harvesting cost (-105.147, 105.147).

CONCLUSION

Sustainable development cannot be achieved without a major contribution from Pisciculture.

The income conditions of the fishermen were not so good. The only source of income of fishermen is selling fish in the market and other place. There are very limited options for non-fishery related activities such as day labor in agricultural field, wall painter, and small trade (shops keepers) work. Moreover, every year many people are getting involved in fishing as a seasonal or part time occupation. As a result, fishing pressure is continuously increasing in the Lake. There are also effects of climate changes. 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 district. They have no other 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. Fishermen suffered many problems in this study area. So there is a necessary to manage and proper guideline for the proper use of resources by community people to ensure their livelihood pattern. Economic

condition of the villagers was not so good. Maximum of the villagers had the ability to take meals three times a day. The villagers mainly invested their money for vegetables production, trade (shop keeper), farming (poultry, cattle), jums cultivation and a few for dairies. Government and NGO's there interventions are therefore very important particularly in the form of education and health services, micro-credit, non-formal education provision. As Purulia is a backward district, so we should utilize our lands and water resources in maximum level to produce maximum output from this culture system so that our poor farmers can be benefited. Government should take necessary steps to improve the socio-economic conditions of fishermen.

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