Comparative Bio-Economics of Tribal Fishermen at Arsha Development Block of Purulia District: Before and After Implementation of Tribal Sub Plan (TSP)

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Abstract

In West Bengal, Purulia District is one of the poorly backward drought prone, topographically severely undulating lands with inadequate irrigation and insufficient of all agricultural inputs. The present status of tribal people is very poor as a consequence they are migrating to neighboring district and state for their source of income. Pisciculture is one of the main pillars of the local economy of the district and people mainly derive their livelihood by exploiting the fishery resources in the water bodies of the district. The district is bestowed with large number of water bodies which are utilized for Pisciculture activities. Fisheries represent a vital sector in the thrust programme of West Bengal Government for rural development through production of fish and other ancillary activities thereby generating rural employment and improvement of socio-economic status of the fishers who are the prime contributors of fisheries production. In general tribal peoples are mostly under BPL level. For this technological and financial help and proper training and monitoring are being required to change the livelihood condition. For improving the production scenario and simultaneous development of the fishers of those districts, the government introduces the Tribal Sub Plan to boost up the process. Accordingly training programmes, supply of feed, seed etc. at subsidised rate and the intervention of technical people are being implemented. As a result definitely a remarkable change in their income generation and affinity to the culture was made. Still Government's efforts in implementing a proper planning and management oriented marketing strategies are required for the sustainable development of the culture towards the upliftment of the employment and livelihood generation of the tribal fisher folks of this districts.

KEY WORDS: Tribal Sub Plan, Tribal Fishermen, Bio-Economics, Correlation, Economic Upliftment

1. INTRODUCTION:

For the process of development of the tribal people, it require management of land base, forest, fisheries, water resources, etc, where open access is there inefficient utilisation has resulted in faster depletion of these resources, less sustainment and as a result, environment degradation. It is evident that even if a ten percent higher efficient utilization is effected by and through avoidance of wastages, a substantial proportion of these resources can be sustainably conserved. Too much crowding for resource exploitation and lack of competitive prices have resulted in an uneconomical infrastructure, superfluous competitions misidentification of priorities lack of appropriate technologization, underplay of local interest and several other problems. Proper management of the commons imply more opportunities for the poor and better distribution of power. This is also essential to really decentra1i the overall decision making process and avoid over concentration of various interests.

Aquaculture, the farming and husbandry of fresh water and marine organisms has been recognised as a potential source of food and industrial product. For the developing countries, it can provide protein as well as foreign exchange. It can also provide alternative employment to fishermen and farmers. Aquaculture production has been increasing rapidly since the seventies. It accounts for about one tenth of combined fresh water and marine capture. Aquaculture is practised to a larger extent in the developing countries, mainly in China. Unlike capture fisheries in which the size of the catch is limited by the size and availability of fish population, aquaculture is limited by the extent of suitable areas. It must be practised close to the shore within estuaries and semi-enclosed bays or in open ocean waters near the shore. The land resource for aquaculture is one dimensional and therefore severe competition amongst the users may ensue. For development of aquaculture and pisciculture, transfer of technology to the developing countries is still in the initial stages.

In rural development which aims at developing the rural areas at par with urban regions common property management assumes greater significance owing to its specific endowment of the natural resources. For example, in exploitation of water resources, non-competitive' prices make water so cheap that this scarce resource is wasted for irrigation purposes. Where irrigation is privatized or competitively priced as in urban areas, the wastages are bound to decline. If community forestry is effectively managed by the community as a whole, deforestation will be minimum than in cases where common forestry is considered as belonging to somebody else. In fisheries, overcrowding and the nature of the commodity may force wastage deliberately. If

entry is regulated and preservation techniques are sophisticated with competitive prices, it has been pointed out that only half of the present resource exploitation would be necessary to fulfil the existing basic needs (Repetto, 1990).

2. 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 2014 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 $22^{\circ}42'35''$ and $23^{\circ}42'0''$ north latitude and $85^{\circ}49'25''$ and $86^{\circ}54'37''$ 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.

3. RESULT AND DISCUSSION:

3.1.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 m²) 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 m²) 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 m²) 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**

3.2.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 Culture of Tribal Sub Plan.

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. pond preparation, transport, raw cow dung, netting during culture, labour charge, harvesting cost, total input and total output under consideration.

Firstly, considering the correlation between pond preparation with other variables, there exist a significant moderate positive correlation with netting during culture, low positive correlation with transport and total output, low negative correlation with total output, moderate negative correlation with labour charge.

Secondly, considering the correlation between transport with other variables, there exist a significant high positive correlation with raw cow dung, moderate positive correlation with total input and total output, low positive correlation with Medicine/Prophylactics, labour charge and harvesting cost, moderate negative correlation with netting during culture.

Thirdly, considering the correlation between raw cow dung with other variables, there exist a significant moderate positive correlation with harvesting cost, total input and total output, low positive correlation with medicine/prophylactics and labour charge, moderate negative correlation with netting during culture.

Fourthly, considering the correlation between netting during culture with other variables, there exist a significant low positive correlation with medicine/ prophylactics, moderate negative correlation with harvesting cost, total input and total output, high negative correlation with labour charge.

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

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

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

Table 4: Correlation Matrix for Average Economics (unit 1bigha) comprising all culture under Tribal Sub Plan of Arsha Block in connection   with Tribal Fish Farming.

	Pond Preparation	Transport (Seed,Feed,Manure etc.)	Raw Cow Dung	Netting during culture	Medicine /Prophylactics	Labour Charge	Harvesting cost	Total Input	Total Output
Pond Preparation	1								
Transport (Seed,Feed,Manure etc.)	.239	1							
Raw Cow Dung	.000	.910(**)	1						
Netting during culture	.530	-.491	-.640(*)	1					
Medicine/Prophylactics	.000	.138	.258	.092	1				
Labour Charge	-.733(*)	.130	.375	-.861(**)	.181	1			
Harvesting cost	.000	.375	.500	-.557	.323	.515	1		
Total input	-.318	.508	.649(*)	-.776(**)	.463	.835(**)	.679(*)	1	
Total output	.291	.657(*)	.686(*)	-.458	.162	.203	.870(**)	.487	1

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

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

From (Table 5), The linear regression equation taking total input as dependent variable and other variables viz. pond preparation, transport, raw cow dung, netting during culture, medicine/prophylactics, labour charge and harvesting cost as independent variables. The equation revealed as below:

Total Input = -10500.000 + pond preparation + transport + (-5.857 x raw cow dung) + netting during culture + medicine/ prophylactics + (1.305 x labour charge) + harvesting cost.

The equation clearly indicates the most important variable (average value calculated for 1 bigha area, in all the cases) is raw cow dung. It is negative 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: pond preparation (-1.000, 1.000), transport (-1.000, 1.000), raw cow dung (-5.857, 5.857), netting during culture (-1.000, 1.000), medicine/prophylactics (-1.000, 1.000), labour charge (-1.305, 1.305), harvesting cost (-1.000, 1.000).

Table 5: Coefficients Matrix for Average Economics (unit 1bigha) comprising all culture under Tribal Sub Plan of Arsha Block in connection   with Tribal Fish Farming.

	Unstandardized Coefficients	95% Confidence Interval for B	
		Lower Bound	Upper Bound
(Constant)	4342.857	-4342.857	4342.857
Pond Preparation	1.000	-1.000	1.000
Transport (Seed,Feed,Manure etc.)	1.000	-1.000	1.000
Raw Cow Dung	-5.857	-5.857	5.857
Netting during culture	1.000	-1.000	1.000
Medicine/Prophylactics	1.000	-1.000	1.000
Labour Charge	1.305	-1.305	1.305
Harvesting cost	1.000	-1.000	1.000

Dependent Variable: Total Input

From (Table 6), The linear regression equation taking total output as dependent variable and other variables viz. pond preparation, transport, raw cow dung, netting during culture, medicine/prophylactics, labour charge and harvesting cost as independent variables. The equation revealed as below:

Total Output = -2937.723+(-.014 x pond preparation) + (.028 x transport) + (15.801 x raw cow dung) + (-.422 x netting during culture) + (-3.391 x medicine/prophylactics) + (-.732 x labour charge) + (43.555 x harvesting cost).

The equation clearly indicates the most important variables (average value calculated for 1 bigha area, in all the cases) are raw cow dung and harvesting cost. Both of them have positive impact upon Total output. All the other independent variables viz. pond preparation, netting during culture, medicine/prophylactics and labour charge have negative impact upon total output, and transport has positive impact upon total output. The 95% Confidence Interval i.e. the lower and the Upper boundaries are depicted as: pond preparation (-4.894, 4.866), transport (-4.323, 4.379), raw cow dung (-50.512, 82.115), netting during culture (-9.680, 8.836), medicine/prophylactics (-39.557, 32.776), labour charge (-2.582, 3.285), harvesting cost (-5.520, 81.589).

Table 6: Coefficients Matrix for Average Economics (unit 1bigha) comprising all culture under Tribal Sub Plan of Arsha Block in connection with Tribal Fish Farming.

	Unstandardized Coefficients	95% Confidence Interval for B	
		Lower Bound	Upper Bound
(Constant)	-2937.723	-67219.396	61343.950
Pond Preparation	-.014	-4.894	4.866
Transport (Seed,Feed,Manure etc.)	.028	-4.323	4.379
Raw Cow Dung	15.801	-50.512	82.115
Netting during culture	-.422	-9.680	8.836
Medicine/Prophylactics	-3.391	-39.557	32.776
Labour Charge	-.732	-4.542	3.078
Harvesting cost	43.555	-5.520	81.589

Dependent Variable: Total Output

4. CONCLUSION:

In the recent days fishery has played a crucial role for the development of tribal community in different parts of West Bengal, where the country share a major policy. A Comparison in the livelihood status specially in the economic upliftment was carried out in the tribals of Purulia district. The growth patterns and the relationship among the different input variable was under study in both cases that is before adoption of Tribal Sub Plan and after enjoying Tribal Sub Plan to judge whether there is any significant different between the two. The western districts Purulia with red laterite soil and primarily being rain fed have fallen behind the rate of growth in terms of productivity in this field. But this district has large number of water bodies mainly in the form of reservoirs and pond and there is immense scope of integration of fish culture with other husbandry practices. As total no of BPL families in rural areas of Purulia are 197381 (43.65 %) of which SC families are 40645 (20.59 %) and ST families are 47666 (24.15 %), there is immense scope of employment generation and economic up gradation through scientific fish farming. For improving the production scenario and simultaneous development of the fishers of the district, the government introduces the Tribal Sub Plan to boost up the process. Accordingly training programmes, supply of feed, seed etc. at subsidized rate and the intervention of technical people are being implemented. As a result definitely a remarkable change in their income generation and affinity to the culture was made. Still Government's efforts in implementing a proper planning and management oriented marketing strategies are required for the sustainable development of the culture towards the upliftment of the employment and livelihood generation of the tribal fisher folks of the district.

REFERENCES:

1.Majhi, A. (2014). Comparative bio-economics of tribal fisherfolk at selected regions of purulia district: before and after implementation of TSP (tribal sub plan) programme. M.F.Sc. Thesis. West Bengal University of Animal and Fishery Sciences.

2.Roy, D. (2012). Socio-economic status of Schedule tribes in Jhakhand.

3.Awais, M. and Ahmad, R. (2013). An analytical study of socio-economic condition of tribal farmers in Bijnor district of U.P. State.

4.Comprehensive District Agricultural Plan Under Rashtriya Krishi Vikas Yojana, Purulia, West Bengal.

5. Repetto, R. ed. The Global Possible, Resources, Development and the New Country,Affiliated East- West Press, New Delhi, 1990. Appendix p. 507

6. Bandyopadhyay K. Pradip.1999. Tribal Situation in Eastern India, Customary Laws among Border Bengal Tribes Gupta Press, Calcutta, Pp. 49-50.

7. Chaudhuri, H. and K.H. Alikunhi. 1957 Observations on the breeding of Indian carps by hormone injection. Curr. Sci. 26 (12), 381–382.