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Economics of Dried Fish in Jaldah Khuti of West Bengal

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ABSTRACT

Fish drying is an important part of the economic development foe the rural coastal people. The present study was carried out to find out the economics of Jaldah khuti in the coastal belt of West Bengal. The survey was made from September 2017 to April 2018. The study area was purposively selected, and the total economics involved in this system was analyzed. Survey question schedule was made for the collection of data. Many marine and coastal species were commonly used for drying like Harpodon nehereus, Prawns & crabs, Sardinella longiceps, Escualosa thoracata, Trichiurus savala, Arius sp, Chirocentrus dorab, Polynemus indicus, Rastraliger kanagurta, Pama pama, Leognathus sp., Polynemus paradiseus, and Setipina phasa etc. Different types of maket intermediataries are involved in the trading system like fish processor, Beparis, Aratdars, Wholesalers, and Retailers etc. The price of dried marine fish varies with the quality of the fish species, size, availability. The study revealed that the dry fish industry can made it a major contributor in earning foreign exchange for our country and at the same time play a crucial role to the socio-economic upliftment and employment generation of a major portion of coastal rural people.

Key word: *Economic analysis, Dry fish, Khuti, Sustainable development.*

INTRODUCTION

Fish is a major source of food for human beings from time immemorial. Fish being an extremely perishable commodity, the proven preservation method of curing is still being practised in India[7,9,3]. In India, consumption of dried fishes is about 32% of the total marine landings and about 17% of the total catch used for the production of dry fishes[13]. Dry fish is an essential source of animal protein supplement, which is preferred as a key dish or used as a flavouring agent in combination with other food items. However, all dry fish are in great demand during the fishing ban period when the availability of fresh fish in the market is lower[2]. Indian dry fish export contributed 8% in fish exports and earned 754 crores during 2012-2013[8].

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But, exported dried items have revealed a negative growth of 38.59% in quantity 28.17% in rupee value and 32.59% in USD terms respectively, even though unit value realisation picked up from 2.35 to 2.58 in the year of 2015-16 with a positive growth of 9.77%[6]. Fish drying is evolved from a subsistence occupation to a full-fledged flourishing business in the coastal districts of West Bengal. Drying of low-value fishes is widely practised by the coastal fishers. Dried fish now caters to different sectors such as quality fish /prawns for human consumption, and low-value fishes for the preparation of fish feed as well as poultry feed. In "Khutis" fishes are dried under natural sunlight in bamboo poles in the coastal areas of West Bengal. The major Khuties located at coastal West Bengal includes Jaldah mohana, Sankarpur, Jaldha, Junput, Mandarmoni, Petuaghat etc.[10]. These khuties have produced 10152 tons dry fish during 2015-16[6]. Purba Medinipur is the leading district of dry fish production in West Bengal with 7475 MT production in 2015-16[6]. Although few authors have studied the marketing network of dry fishes in West Bengal, the economics of fish drying and marketing is less explored[12,5,14]. To study the economics of fish drying and associated marketing channels of Jaldah Khuties, the current study was performed.

MATERIAL AND METHODS

Sampling Frame

To assess the economics of fish drying Jaldah of Ramnagar-I block from Contai sub-division was purposively selected as representative from the district of Purba Medinipur. A list of 150 families connected with fish drying who are living in the surrounding area of the selected Khutis were prepared, and ten Khuti owners and dry fish processors were randomly selected for questionnaire and interview. Similarly, two auctioneers, two wholesalers and two retailers were also randomly selected for marketing analysis through interview and questionnaires.

Questionnaires and Data Collection

The questionnaire was developed in a logical sequence of that the target group could answer chronologically. For this study, a combination of the questionnaire, interview, Participatory Rural Appraisal (PRA) tool such as Focus Group Discussion (FGD) and cross-check interviews with key informants were used.

Data Collection

Secondary data were collected from the available sources. Primary data were collected in 2017 using pre-tested structured questionnaires and interview in the local language and subsequently converted to English. Collected data were suitably categorized, tabulated for interpretations, generalizations and implications.

Analysis of Data

The collected data were statistically analyzed using the statistical package SPSS 20.0 computer program (SPSS Inc. Chicago, Illinois, USA). Microsoft Excel was used for the representation of data and results.

To estimate the various cost and income[11] and to obtain profitability measures[4] available standard procedures were followed.

RESULTS AND DISCUSSION

A. Capital cost

In Jaldah khuti the capital cost value (unit: 1 bigha) for land and farm equipment, construction of bamboo rack, construction of the cemented tank and miscellaneous was Rs. 5539.65 ± 1505.23, Rs. 25551.25 ± 5690.66, Rs. 8744.52 ± 2874.10 and Rs. 3534.01 ± 1091.59 respectively while the total capital cost was Rs. 43369.43 ± 9379.481.

In table 2, when considering correlations of the capital cost of farms in Jaldah Khuti, it is seen that there is significant (5% level) moderate positive correlation between miscellaneous capital cost and construction of bamboo rack and total capital cost. Also, there was observed a significant (1% level) moderate positive correlation between Construction of cemented tank and Land and farm equipment and Total capital cost. Also, it was observed that there is significant (1% level) high positive correlation between the construction of bamboo rack and

total capital cost. Table 2 it was also indicated that there is significant (5% level) moderate positive correlation between Land and farm equipment and total capital cost.

Model 1: Revealed with the stepwise method of regression:

The equation clearly indicates that the most important variables (average value calculated for 1 bigha, in all the cases) are the cost of Construction of cemented tank, construction of bamboo rack, Land and farm equipment and Miscellaneous which showed positive impact upon capital cost. By observing adjusted R^2 value, it can be concluded that both parameters explain 100% variability in total capital cost.

Total capital cost = 0.0204 + 0.999 X construction of bamboo rack + 0.999 X Construction of cemented tank + Land and farm equipment + Miscellaneous

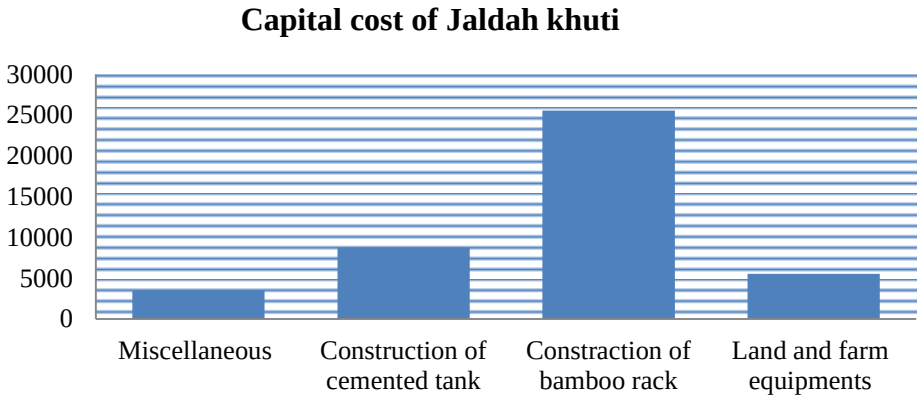

Fig. 1: Capital cost of Jaldah Khuti

A. Variable cost

The analysis depicted the variable cost value (unit: 1 bigha) for raw fish price, salt price, transportation cost, cost of temporary shed, electricity charges, labour charge and miscellaneous cost was Rs. 891436.62 ± 167205.01, Rs. 45540.22 ± 12166.45, Rs. 45075.96 ± 13309.71, Rs. 23018.53 ± 5534.26, Rs. 4697.15 ± 1375.83, Rs. 90996.51 ± 20079.65 and Rs. 7119.27 ± 2460.27 respectively. The total variable cost was Rs. 1107884.26 ± 213986.02.

In table 3, when considering correlations of variable cost of farms in Jaldah Khuti, it is seen that there is significant (1% level) moderate positive correlation between raw fish price and salt price, a significant (1% level) moderate positive correlation between raw fish price and transportation cost, a significant (1% level) moderate positive correlation between raw fish price and temporary shed, a significant (1% level) moderate positive correlation between raw fish price and electricity charges, a significant (1% level) moderate positive correlation between raw fish price and miscellaneous and a significant (1% level) high positive correlation between raw fish price and total variable cost. Further it is observed that there is a significant (5% level) moderate positive correlation between salt price and transportation cost, a significant (5% level) moderate positive correlation between salt price and temporary shed, a significant (1% level) high positive correlation between salt price and miscellaneous, a significant (1% level) moderate positive correlation between salt price and total variable cost. In case of transportation cost, it was seen that there was a significant (5% level) moderate positive correlation with temporary shed and miscellaneous cost and a significant (1% level) moderate positive correlation with electricity charge and total variable cost. There was a significant (1% level) moderate positive correlation between the temporary shed and

miscellaneous and it was same for the total variable cost. A significant (1% level) moderate positive correlation was there between electricity cost and total variable cost. A significant (1% level) moderate positive correlation was there between labour charge and total variable cost, and it was same for miscellaneous cost. In case of miscellaneous cost there was a significant (1% level) moderate positive correlation with total variable cost.

Model 1: Revealed with stepwise method of regression:

Total Variable Cost (T.V.C) = 2710.444 + 1.028 X Raw fish price + 1.279 X Labour charges + 5.259 X Miscellaneous + 0.762 X Transportation cost

The equation clearly indicates that the most important variables (average value calculated for 1 bigha, in all the cases) are raw fish price, transportation cost, labour charges and miscellaneous which showed positive impact upon variable cost. By observing adjusted R^2 value, it can be concluded that both parameters explain 100% variability in total variable cost.

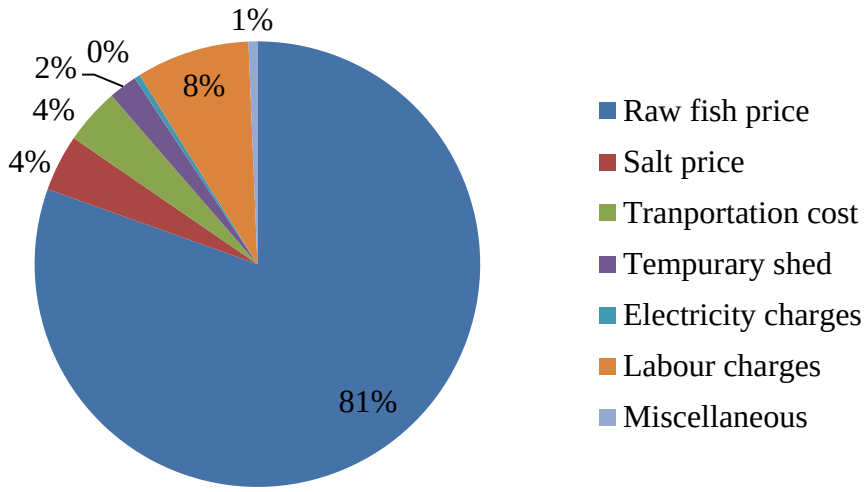

Fig. 2: Variable cost of Jaldah khuti

B. Fixed costs

The fixed cost for Khuties includes depreciation on fixed costs (@ 10%), interest on capital costs (@ 11%) and interest on variable costs (@ 11%). The values were Rs. 4336.94 ± 937.95, Rs. 3942.68 ± 852.68 and Rs. 100716.75 ± 19453.27 respectively and the total fixed cost was Rs. 108996 ± 21163.

Analysis reveals that there is significant high correlation (1%) between interest on capital costs and depreciation on capital costs, interest on variable costs and depreciation on capital costs, total capital costs and depreciation on capital costs, Interest on capital costs and interest on variable costs, interest on capital costs and total fixed costs and interest on variable costs and total fixed costs (Table 4).

Concise Analytical Discussion for Average Economics (unit 1 bigha) in connection with Fixed Cost for dry fish industry considering all the involved parameters, of study area:

It is seen that there is significant high correlation (1%) between interest on capital costs and depreciation on capital costs, interest on variable costs and depreciation on capital costs, total capital costs and depreciation on capital costs, Interest on capital costs and interest on variable costs, interest on capital costs and total fixed costs and interest on variable costs and total fixed costs in table 4.

Model 1: Total fixed costs (TFC) = -0.06034+ 0.999 X interest on variable costs + 1.909 X depreciation on capital costs

The equation clearly indicates that the most important variables (average value calculated

for 1 bigha, in all the cases) interest on variable costs and depreciation on capital costs which showed positive impact upon Total fixed costs. By observing adjusted R^2 value, it can be concluded that electric both parameters explain 100% variability in total fixed cost.

APPENDIX

Table 1: Average economics of Jaldah khuti and their ratio analysis (Unit: Rs.)

Particulars	Digha
Area of Khuti (bigha)	1
area of farm (Sq. metres)	1337.8
Construction of cemented tank	8745
Construction of bamboo rack	25551
Land and farm equipment	5540
Miscellaneous	3534
Total capital cost	**43369**
Raw fish price	891437
Salt price	45540
Transportations cost	45076
Temporary shed	23019
Electricity charges	4697
Labour charges	90997
Miscellaneous	7119
Total variable cost	**1107884**
Depreciation on capital cost @ 10%	4336.94
Interest on capital cost @ 11%	3942.68
Interest on variable cost @ 11%	100716.75
Total fixed cost	**108996**
Total cost	1216881
Total dry fish produce (5 months)	12381
Average price	123
Gross revenue	**1524265**
Net revenue	**307384**
Operating Ratio (OR)	**72.68%**
Fixed Ratio (FR)	**7.15%**
Gross Ratio (GR)	**79.83%**
Net operating income	**416381**
Net profit	**307384**
Input output ratio	**0.67**
Profitability ratio	**0.28**
Net profit ratio	**0.20**
Productivity Index	**125%**
Per kg. production price	**98.28**

Table 2: Correlation Matrix for Average Economics (unit 1 bigha) in connection with Capital Cost of dry fish industry considering all the involved parameters in Jaldah khuti

	Construction of cemented tank	Construction of bamboo rack	Land and farm equipment	Miscell aneous	Total capital cost
Construction of cemented tank	1.000				
construction of bamboo rack	0.529	1.000			
Land and farm equipment	0.772**	0.488	1.000		
Miscellaneous	0.254	0.744*	0.214	1.000	
Total capital cost	0.781**	0.934**	0.718*	0.680*	1.000
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Table 3: Correlation Matrix for Average Economics (unit 1 bigha) in connection with Variable Cost of dry fish industry considering all the involved parameters in Jaldah khuti

	Raw fish price	Salt price	Transportation cost	Temporary shed	Electricity charges	Labour charges	Miscellaneous	Total variable cost
Raw fish price	1.000							
Salt price	.837**	1.000						
Transportation cost	.851**	.703*	1.000					
Temporary shed	.781**	.745*	.646*	1.000				
Electricity charges	.809**	0.503	.846**	0.520	1.000			
Miscellaneous	.842**	.904**	.754*	.862**	0.502	.772**	1.000	
Total variable cost	.996**	.871**	.873**	.791**	.804**	.879**	.865**	1.000
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								
c. List wise N=10								

Table 4: Correlation Matrix for Average Economics (unit 1 bigha) in connection with Fixed Cost of dry fish industry considering all the involved parameters in Jaldah khuti

	Depreciation on capital cost @ 10%	Interest on capital cost @ 11%	Interest on variable cost @ 11%	Total fixed cost
Depreciation on capital cost @ 10%	1.000			
Interest on capital cost @ 11%	1.000**	1.000		
Interest on variable cost @ 11%	.951**	.951**	1.000	
Total fixed cost	.959**	.959**	1.000**	1.000
**. Correlation is significant at the 0.01 level (2-tailed).				

CONCLUSION

The success of any investment can be assessed by analyzing the economics of the project. In case of dry fish industry it requires a sustainable policy starting from the procurement of fishes, up-gradation of the process maintaining the hygiene and the quality of the product through branding along with an appropriate marketing opportunity free from intervention of the middleman. Credit facility side-a-side insurance schemes may be incorporated to safeguard the fishers. As women's participation had the lion's share of fish drying process, different measures related to health, education of the children, sanitary condition, safe and quality accommodation is of utmost importance towards the growth of the industry. With a synergistic effect of the above clauses obviously, make a turn of the industry towards the prosperity of both the industry and its allied community in near future meeting up the protein security of the underprivileged humanity of the country. Understanding of costs and returns involved in the dry fish industry is very essential to propose correct management strategies for sustainable and profitable fish drying method which is an extreme focus area from the standpoint of the country's export promotion and foreign exchange earnings.

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