

Original Research Article

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Economic Analysis of Fish Drying in Junput Khuti of West Bengal

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ABSTRACT

For a social and economic standpoint fish drying will remain an important part of the rural economy. The present investigation was conducted to find out the economics of Junput khuti in coastal belt of West Bengal. The survey was done 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. Several species of coastal and marine fish like *Harpodon nehereus*, *Trichiurus savala*, Prawns and crabs, *Sardinella longiceps*, *Chirocentrus dorab*, *Polynemus indicus*, *Rastraliger kanagurta*, *Pama pama*, *Leognathus* sp., *Setipina phasa*, *Arius* sp, *Escualosa thoracata* and *Polynemus paradiseus* etc were commonly used for drying. Different types of businessmen are involved in the trading system like fish processor, Beparis, Aratdars, Wholesalers, Retailers and exporters etc. The price of dried marine fish varies with the size, seasonal availability and quality of the fish species. The study revealed that the dry fish industry can made it a major contributor in earning foreign exchange and at the same time play a crucial role to the employment generation and socio-economic upliftment of a major portion of coastal rural fisher folk.

Keywords

Dry fish, Economic and point, Sustainable development

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Introduction

Dry fishes are value-added products of low-cost marine fishes with increased shelf-life of the perishable fishes for longer storage. Among the world, India is the second fish producing country and contribute 5.43% in global fish production. In relations to nutritional quality of fish, sometimes dry fish show higher quality standards than of fresh fish (Payra *et al.*, 2016). 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 (Shakila *et al.*, 2003).

In drying, salt is used to remove the non-halophilic, spore-forming bacteria and osmophilic fungi (Sivaraman *et al.*, 2015). Dry fish is an essential source of animal protein supplement, which is preferred as a keydish 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 (Das *et al.*, 2013).

Fish is an essential component of the daily diet, and the dried fish is a vital source of protein in India and especially in West Bengal. Being a state of rivers, bays and reservoirs with a high potential of aquatic resources, fisheries of West Bengal play an important role in the employment generation of rural coastal people. The state has 3 coastal districts. They are East Midnapore, South 24 Parganas, North 24 Parganas. Essential landing centres are Diamond Harbour, Kakdweep, Namkhana, Digha, Sankarpur etc. The state has many landing centres and fishing villages along the coast. About 61 % of the total landings are taken in the fresh condition, and the remaining part is utilised by various fishery industries. The coastal people of these districts are engaged in fish curing/drying activities. In West Bengal where fish landing, as well as drying activity, is undertaken is known as Khuti (Samanta *et al.*, 2016). In Khutis fishes are dried under natural sunlight in bamboo poles in the coastal areas. The major Khuties located a coastal West Bengal includes Digha mohana, Sankarpur, Jaldha, Junput, Mandarmoni, Petuaghat etc. (Payra *et al.*, 2016). These khuties have produced 10152 tons dry fish during 2015-16 (GoWB, 2016).

Materials and Methods

Sampling frame

To assess the economics of fish drying of Junput khuti of Deshapran CD 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 2017-18 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 (Salim and Biradar, 2011) and to obtain profitability measures (Dhondyal, 1998) available standard procedures were followed.

Results and Discussion

Capital cost

In table 2, when considering correlations of the capital cost of farms in Junput Khuti, it is

seen that there is significant (1% level) high positive correlation between Construction of cemented tank and total capital cost.

Model 1: Revealed with stepwise method of regression

$$\text{Total capital cost} = 0.124 + 0.999 X \text{ construction of cemented tank} + 0.999 X \text{ construction of Bamboo rack} + 0.999 X \text{ Land and farm equipment} + 0.999 X \text{ Miscellaneous}$$

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.

Variable cost

A variable cost is a corporate expense that changes in proportion with production output. Variable costs increase or decrease depending on a company's production volume; they rise as production increases and fall as production decreases.

Variable costs are costs that change in proportion to the good or service that a business produces. Variable cost includes raw fish price, salt price, transportation cost, temporary shed, electricity charges, labour charges and miscellaneous.

The analysis depicted the variable cost value (unit: 1 bigha) for the raw fish price, salt price, transportation cost, cost of temporary shed, electricity charges, labour charge and the miscellaneous cost was Rs. 1283616 \pm 752400, Rs. 50495 \pm 5139, Rs. 48835 \pm 5939,

Rs. 25265 \pm 4302, Rs. 5536 \pm 1043, Rs. 97966 \pm 18826 and Rs. 8017 \pm 1467 respectively. The total variable cost was Rs. 1207427 \pm 207571.

In table 3, when considering correlations of variable cost of farms in Junput Khuti, it is seen that there is significant (1% level) moderate positive correlation between raw fish price and salt price, significant (5%) moderate positive correlation between raw fish price and temporary shed, significant (1%) high positive correlation between raw fish price and labour charge, significant (1%) high positive correlation between raw fish price and total variable cost. It was also seen that a significant (1% level) moderate positive correlation between salt price and transportation cost, significant (1%) high positive correlation between salt price and temporary shed, significant (5%) moderate positive correlation between salt price and labour charge, significant (1%) high positive correlation between salt price and total variable cost. Further, it was seen that there is significant (5% level) moderate positive correlation between transportation cost and temporary shed, significant (1% level) high positive correlation between transportation cost and labour charge, significant (5% level) moderate positive correlation between transportation cost and total variable cost. Table 4 also depicted that a significant (5% level) moderate positive correlation between temporary shed and electricity charge, significant (5% level) moderate positive correlation between temporary shed and labour, significant (5% level) moderate positive correlation between the temporary shed and total variable cost. In case of electricity charge, it was seen that there was a significant (5%) moderate positive correlation with labour charge. It was also seen that between labour charge and total variable cost there was also a significant (5%) high positive correlation (Fig. 1 and 2; Table 1).

Questionnaires and Data Collection



Fig.1 Capital cost of Junput Khuti

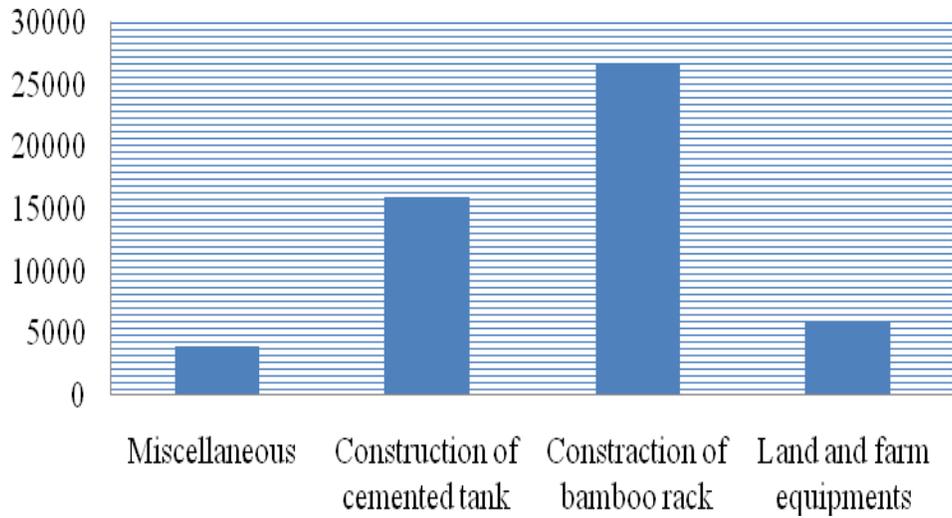


Fig.2 Variable cost of Junput khuti

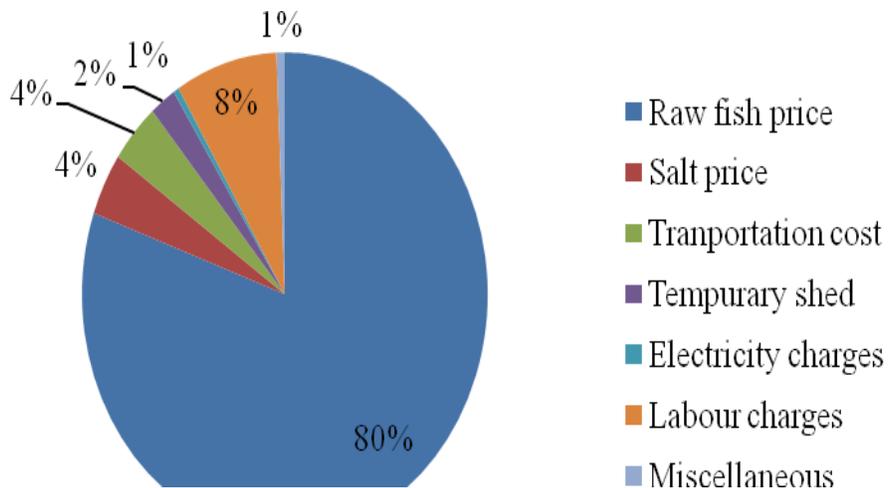


Table.1 Average economics of Junput khuti and their ratio analysis (Unit: Rs.)

Particulars	Junput
Area of Khuti (bigha)	1
area of farm (Sq. metres)	1337.8
Construction of cemented tank	15901
Construction of bamboo rack	26751
Land and farm equipment	5875
Miscellaneous	3894
Total capital cost	52421
Raw fish price	971313
Salt price	50495
Transportations cost	48835
Temporary shed	25266
Electricity charges	5536
Labour charges	97966
Miscellaneous	8017
Total variable cost	1207428
Depreciation on capital cost @ 10%	5242.09
Interest on capital cost @ 11%	4765.54
Interest on variable cost @ 11%	109766.18
Total fixed cost	119774
Total cost	1327202
Total dry fish produce (5 months)	13490
Average price	110
Gross revenue	1758227
Net revenue	431025
Operating Ratio (OR)	68.67%
Fixed Ratio (FR)	6.81%
Gross Ratio (GR)	75.49%
Net operating income	550799
Net profit	431025
Input output ratio	0.63
Profitability ratio	0.36
Net profit ratio	0.25
Productivity Index	132%
Per kg. production price	98.38

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 Junput khuti

	Construction of cemented tank	Construction of bamboo rack	Land and farm equipment	Miscellaneous	Total capital cost
Construction of cemented tank	1.000				
Construction of bamboo rack	-0.515	1.000			
Land and farm equipment	-0.172	0.095	1.000		
Miscellaneous	-0.285	0.457	0.315	1.000	
Total capital cost	0.946**	-0.230	-0.057	-0.091	1.000

** . Correlation is significant at the 0.01 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 Junput 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	.776**	1.000						
Transportation cost	0.614	.782**	1.000					
Temporary shed	.705*	.869**	.745*	1.000				
Electricity charges	0.476	0.540	0.591	.723*	1.000			
Labour charges	.809**	.660*	.829**	.661*	.715*	1.000		
Miscellaneous	0.366	0.335	0.504	0.555	0.439	0.381	1.000	
Total variable cost	.996**	.802**	.677*	.741*	0.530	.852**	0.395	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 Junput 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%	-0.120	-0.120	1.000	
Total fixed cost	0.028	0.028	.989**	1.000

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

b. Listwise N=10

Model 1: Revealed with the stepwise method of regression

$$\text{Total Variable Cost (T.V.C)} = 4559.19 + 1.031 \times \text{Raw fish price} + 1.993 \times \text{Transportation cost} + 3.416 \times \text{Electricity charges} + 0.616 \times \text{Labour charges} + 0.964 \times \text{Temporary shed}$$

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, electricity charges, labour charges and temporary shed which showed positive impact upon variable cost. By observing adjusted R² value, it can be concluded that both parameters explain 100% variability in total variable cost.

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. 5242± 1460, Rs. 4765± 1328 and Rs. 109766± 18870 respectively and the total fixed cost was Rs. 105130 ± 15686.

Model Revealed with stepwise method of regression

$$\text{Total fixed costs (TFC)} = 0.0866 + 0.999 \times \text{interest on variable costs} + 1.909 \times \text{depreciation on capital costs}$$

It is seen that there is a significantly high correlation (1%) between interest on capital costs and depreciation on capital costs and interest on variable costs and total fixed costs in table 4. 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 R²

value, it can be concluded that electric both parameters explain 100% variability in total fixed cost.

Shifting from an underdeveloped sector towards a promising sector, first of all, it requires the attention of the government towards both the fishery and fishers related to the industry. In case of fishery 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 the 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.

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