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A study on problems and constraints in production and marketing of fish in West Bengal

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ABSTRACT

The present study has identified three major marketing channels which are of very short period. It is found that the price spread is highest in channel III amounting Rs. 24.07 per kg of fish followed by Rs.10.14 in channel II, while there is a price spread of only Rs. 4.05 per kg of fish in channel I as the farmers sell their catch directly to the consumers. This indicates a very normal situation with greater marketing efficiency. The major constraints faced in production and marketing of fishes are theft and pilferages, non availability of quality fish seeds, lack of government support both technically and financially, quarrel and litigations among the owners of the pond, poor adaptability of fish seed in new environment, non availability of quality fish seeds, , lack of government support, labour crisis, high degree of perishability of the product, cut throat competition, inconsistent supply of fish, lack of storage facility etc.

***Keywords*:** Fish marketing, marketing margin, marketing channel

Fish production in India has increased from 5.7 million tonnes (MT) in 1999-'00 to 8.3 MT in 2011-'12 of which the contribution of marine and inland fisheries are 3.2 MT and 5.07 MT, respectively. Among Indian states, West Bengal occupies the first position in production and consumption of fish. West Bengal produced 1.61 MT of fish during the year 2011-12 constituting 19.49 percent of the total production of India (Govt. of India, 2012). Where, other states like Karnataka and Andhra Pradesh have registered an annual compound growth rate of 8 and 11.48 per cent respectively, far ahead of West Bengal (4.85 %), Tamil Nadu (4.47 %) and Gujarat (3.38%). In spite of being largest producer and consumer of fish, the consumption demand for fish is lagging far behind the supply in the state and depends on other states namely, Andhra Pradesh, Bihar, Tamil Nadu. Lower productivity due to wide variations among fish production units along with many other socio-economic factors significantly influenced the demand supply gap in the state. Although, the fish production of West Bengal is increasing over the year but the productivity of the fishery sector shows a very less increment over the year due to over fishing, lack of quality fish seed in proper ratio, lack of marketing infrastructure, socio-economic and environmental constraints (Roy, 2008) and again the most farmers used to follow traditional technology due to the absence of fishery extension services (Singh, 2001).

Breaking up of joint family system, quarrel among legal owners, rivalry, theft, lack of renovation of existing ponds etc. have rendered large numbers of potential water bodies unproductive which could have play an important role in bridging the gap. Farm to farm differences in cultural practices are also considered as important factors contributing to the variations in productivity. There is a huge differences in the size of the pond/farm, species cultured, stocking and stocking density, fish seed procurement, nursery management, feed and feeding management, pond fertilization, harvesting frequency, mode of fish marketing, source of information on aquaculture, fish seeds and disease treatment, perception on aquaculture etc. (Abraham *et al*., 2010).

Apart from shortfall in production, inefficient marketing system both within and outside the state is also impeding the smooth supply and timely availability of fish in market. With likely increase in contribution from inland fisheries sub-sector, especially culture fisheries, the necessity of developing an efficient domestic marketing system assume great importance, since, the producers are concentrated in particular location while the consumers are spread countryside (Kumar *et al*., 2010).

So, marketing of fish is as important as that of production considering the dominance of widely scattered marginal and small fish farmers of West Bengal. But over the years, this aspect remains neglected and continues to be the major source of exploitation of the producers in the hands of intermediaries. The fish marketing system is very poor and highly inefficient in India (Kumar *et al*., 2008) and an efficient marketing system is assumed to take care of the interest of both the consumers and producers. Fish marketing system is complex owing to huge differences in species, size, taste, extent of perishability, keeping quality of fish, etc. Again there is a difference in marketing of marine and inland fish

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(including fish cultured in fresh water and waste water) production.

The other major problems include high perishability and bulkiness of material, high cost of storage and transportation, poor quality and quantity assurance, low demand elasticity and high price spread. In this context, the present study is an attempt to identify the marketing channels involved in marketing of fish produced in inland aquaculture and also to compute the relative efficiency. The study also highlights the major constraints related to production and marketing of fish in selected study area.

MATERIALS AND METHODS

Primary information collected from purposively selected six villages of Birbhum district of West Bengal form the data base of this study. A total of 120 fish farmers are selected by simple random sampling without replacement (SRSWOR) technique. A well structured and pre-tested schedule has been used to collect primary information related to production and marketing of fish. For the analysis of market efficiency, the three popular methods of measuring the marketing efficiency namely, conventional, Shepherd's and Acharya's methods are employed. For prioritizing the constraints faced by farmers and market intermediaries Garrett's ranking technique has been applied. The three efficiency measurement methods used in the study are presented as follows:

i) Conventional method: $ME = \frac{MC + MM}{MC} = \frac{GMM}{MC}$

ii) Shepherd's method: $ME = \frac{RP}{MC + MM} = \frac{RP}{GMM}$

iii) Acharya's method: $MME = \frac{FP}{MC + MM} / \frac{RP}{MC + MM} - 1$

As, $[RP = FP + MC + MM]$

Where,

ME: Marketing efficiency

MME: Modified measure of marketing efficiency

MC: Total marketing costs

MM: Total net marketing margin

GMM: Gross marketing margin

RP: Retailer's price or Price paid by the consumer

FP: Net price received by the producer

Garrett's ranking technique:

$$\text{Percentage position} = \frac{100(R_{ij} - 0.50)}{N_j}$$

where,

R_{ij} = Rank given for the i^{th} item by the j^{th} individual

N_j = Number of items ranked by the j^{th} individual.

In this method, respondents are asked to rank the specific problems faced by them according to their own perception. The assigned rank is converted into percentage position which is subsequently transferred into Garrett score using Garrett's table. For each constraint, scores of individual respondents are added together and then divided by total number of respondents. Thus, mean score for each constraint has been ranked by arranging them in descending order.

RESULTS AND DISCUSSION

At the outset, we will examine the relative efficiency of the identified channels in terms of marketing margin, price spread, marketing cost and producer's share in consumers' rupee.

Marketing Channels, marketing margin and price spread in relation to marketing of fish

In the study area, most of the fish farmers are marginal and small and the total production is used to meet the consumption need of local people or nearby towns. So, farmers sell either directly to consumers or itinerant traders purchase fish from producers and sell in the local market to ultimate consumers. Small quantity of fish is transported to nearby districts and sold through wholesalers. In short, the total fish production of the district is marketed largely through the following three channels:

Channel I: Fish farmer → Consumer

Channel II: Fish farmer → Petty trader/Retailer → Consumer

Channel III: Fish farmer → Wholesaler→ Retailer → Consumer

Table- 1 represents the distribution of marketing costs, margins and producer's share in consumers' rupee at different stages of the three identified marketing channels. Direct selling to consumers by producers brings an additional income of Rs. 2.53 per kg of fish in channel I. In channel II, local itinerant traders purchase fish at farm gate and at the same time, perform the function of retailing in local market. Performing these two opposite activities i.e. buying and selling, they receive a net income of Rs. 6.28 per kg of fish. Fish producers in channel III, earn an additional income of Rs. 3.69 per kg of fish by incurring an extra cost of Rs. 5.68 per kg of fish. The net earnings of wholesaler and retailers are Rs. 3.79 and Rs. 5.79 per kg of fish respectively. The prices of fish at retailer level are Rs. 58.19, Rs. 64.28 and Rs. 78.21 per kg for channel I, channel II and channel III respectively. The producer's share in consumers' rupee is estimated to be 97.39, 87.97 and 73.94 percent for three channels in the same order.

Table 1: Estimation of marketing costs, margins and producer's share in consumer rupee identified in fish marketing channels (Rs. / kg of fish)

Particulars	Channel I	Channel II	Channel III
Price of fish at farm gate	54.14	54.14	54.14
Cost incurred by farmers	1.52	----	5.68
Selling price of the farmer	58.19	----	63.51
Net margin of the farmer	2.53	----	3.69
Purchase price of petty trader/retailer	----	----	----
Cost incurred by petty trader/retailer	----	----	----
Selling price of fish to consumer	----	----	----
Net margin of the petty trader/retailer	----	----	----
Purchase price of wholesaler from farmer	----	----	63.51
Cost incurred by the wholesaler	----	----	2.41
Selling price of wholesaler to petty trader/retailer	----	----	69.71
Net margin of the wholesaler	----	----	3.79
Purchase price of petty trader/retailer	----	54.14	69.71
Cost incurred by petty trader/retailer	----	3.85	2.71
Selling price of petty trader to consumer	----	64.28	78.21
Net margin of the petty trader/retailer	----	6.28	5.79
Purchase price of the consumer	58.19	64.28	78.21
Producer's share in the consumers' price (per cent)	97.39	87.97	73.94
Price spread or gross marketing margin	4.05	10.14	24.07
Total cost of marketing	1.52	3.85	10.80
Net marketing margin	2.53	6.28	13.27

Measurement of marketing efficiency

Marketing efficiency is calculated by three different methods for three different channel is given in table- 2. It is quite noticeable that the marketing coefficients estimated by three methods are in descending order in three channels. It may be inferred that channel I is more efficient than channel II and channel III is less efficient than channel II. But one important thing is to be noted that, lower value does not always reflects inefficiency if involvement of processing and value addition through marketing functions are considered. But in this case, due to lack of processing and value addition, the efficiency of the marketing channels can easily be compared by just seeing the calculated value.

Table 2: Marketing efficiency of different marketing channels by various methods

Methods	Channel I	Channel II	Channel III
Conventional	2.67	2.63	2.23
Shepherd's	14.37	6.34	3.25
Acharya's	14.00	5.34	2.40

Problems and constraints faced by the farmers and market intermediaries

The fish producers and market intermediaries face multidimensional problems ranging from physical, socio-economical to ecological and environmental in production and marketing of fish. These constraints are ranked based on the realisation of the actual growers and intermediaries and have been prioritised using Garrett's ranking technique.

Problems and constraints faced by the farmers in aquaculture

The important problems confronted by the fresh water fish farmers are having Garrett's score greater than ten are listed in Table 3 in descending order. It reveals that the incidence of theft and pilferages are the most important factor causing huge loss and a potential threat against the survival of fish farming occupation. The fish growers placed this problem in the top of the list having Garrett score of 41.17. The second place is assigned to the problem of non-availability of quality fish seed in right time leading to low production and thereby less income. These two dominant problems are far ahead of other nineteen identified constraints. Scarcity of natural feed arising out of continuous rearing forces growers to depend on costly artificial feed. Most of the fish growers used to borrow money from village moneylenders at high interest rate varied from 24 to 48 percent per annum. So, financial support from government has an urgent need to save the farmers from the clutches of usurious moneylenders. According to Garrett score these problems occupy the next three positions in the list. The need for extensive extension programmes for pursuing farmers to adapt modern techniques to make the occupation more remunerative comes next with Garrett score of 14.80.

Among the ecological and environmental factors, poisonous gas formation, shallow water depth, high water temperature during summer season, lack of exposure to sunlight due to presence of big trees at the bank of the pond, quarrel and litigations among the owners of the ponds hinders the taking up of innovative practices, lack of supervision as the ponds are situated far from the house, poor adaptability of fish seeds to the new aquatic environment resulting lesser yield are the other constraints ranked by the respondents in descending order of their importance.

Problems and constraints faced by the market intermediaries

According to the perception of the farmers and some market intermediaries the major problems faced in marketing of fish are documented and presented in Table 4. Low production and high demand in rural areas necessitates efficient marketing system to benefit all stakeholders including producers, consumers and market intermediaries.High perishability coupled with absence of storage facilities, quality deterioration result lower income of intermediaries are also major problems faced by market functionaries. According to the perception of market functionaries high perishability associated with cut throat competition is the most damaging aspects of fish business and occupy the first and second position among the thirteen identified market related problems with Garrett score 57.80 and 31.67 respectively. More than 10 point Garrett score are attached to the problems related to infrastructural facilities, lack of processing unit, high bargaining power of the consumers, high price fluctuation, lack of government support etc.

Table 3: Ranking of problems and constraints faced by the farmer in fresh water aquaculture along with Garrett's score

Problems and constraints	Garrett score	Rank
Theft and pilferages	41.17	I
Non availability of quality fish seeds	30.13	II
Lack of natural feed	17.67	III
Lack of Government support	16.10	IV
Lack of Resource	15.53	V
Lack of extension services	14.80	VI
Gas formation during rainy and summer season	14.50	VII
Quarrel and Litigation among the owners of the pond	14.07	VIII
Distance from the house	11.58	IX
Adaptability of fish seed is very low in new environment	11.47	X
Diseases of Fish	10.87	XI
Productivity of the soil of the pond	10.83	XII

Table 4: Ranking of problems and constraints faced by the market intermediaries in marketing of fish along with Garrett's score

Problems and constraints	Garrett score	Rank
High Perishability of the product	57.80	I
Huge competition	31.67	II
Inconsistent supply of fish	26.73	III
Lack of storage facility	24.87	IV
High bargaining and lack of purchasing power	23.27	V
High price fluctuation	15.73	VI
Unsuitable position of market yard	15.67	VII
Dependence on other state for supply	13.33	VIII
Lack of government support	13.53	IX
Lack of processing unit	12.00	X

The demand for fish in rural areas of West Bengal is increasing over time with the increase in purchasing power and standard of living. Although, the state has registered a high growth in fish production, the supply in countryside is shrinking due to deceleration in area arising out of situations like rural rivalry, litigation, theft, breaking of joint family etc. The traditional system of fish production has failed to meet the growing demand, resulting excessive dependence on commercially managed, organized fish production units, locally known as 'bheries' and on the supply from other fish producing states which are largely controlled by big market intermediaries. Market functionaries deprive both producer as well as consumers equally through creating artificial crisis. Government intervention in addressing the major problems mentioned previously with a view to increase the domestic production might have reduce over dependence on market middlemen and will be helpful in maintaining steady supply and thus the interest of both the producer and consumers will be preserved.

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