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Efficiency and Performance of Inland Fish Markets in Nanded District of Maharashtra: "A Supply Chain Approach"

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ABSTRACT

With the objective to understand the efficiency of domestic fish marketing system, the present study undertaken in the Nanded district of Maharashtra. The channel 2 is responsible for majority of the fish dispose i.e. 51.12 per cent, followed by channel 3(15.07%). The marketing cost, marketing margin and marketing efficiency of all five marketing channel was analyzed in the study. The investigation revealed the existence of 5 prominent marketing channels prevalent the district out which Channel 2 (Fisher-wholesaler-retailer-consumer) found out to be the major channel in terms of quantity handled with share of about 51 percent. The analysis shows that the market cost is highest in the wholesaler (Rs.7.66/Kg) due to high catch handled per day by them. This is followed by retailers (Rs.5.40/Kg), due to transportation, ice cost etc. The least cost is incurred to the auctioneers (Rs.2.44/Kg) due to minimum transportation cost and ice also minimum ice cost as the auctioneers does not store the fishes in most of the cases. The total price spread in supply chain is estimated as Rs.33.51/Kg. The fishers share is consumer rupee is calculated as Rs.69.65 per cent for the same channel. As the length of the channel increase the marketing efficiency decreases, this is clear from the result that the channel first has the marketing efficiency of 2.29 followed by channel 2 i.e. 1.33. The third channel has the marketing efficiency of 1.03, followed by 0.88 for the channel 4 and 0.76 for the fifth and final marketing channel.

Key words: *Marketing efficiency, Marketing Channel, Marketing margin, Price spread.*

INTRODUCTION

Inland fisheries development had not been a priority until recent years in India. In the period 1950-90, the main focus of the country was on the marine sector. During 1998-99 the inland fisheries transcend the marine fish production and there was consolidation of institutional support and a planned process for the development of this sector then started. India is second in Inland fish production in the world next only to China with the production of 6.14 Million metric tons[1].

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The expansion of Inland fisheries has mainly been due to research and development breakthroughs, compliance with consumer demands and improvements in aquaculture policy and moving from a traditional activity to a well-developed sector. Domestic fish marketing in India holds a huge potential and is highly unorganized and unregulated. It has long been neglected for various reasons and serious efforts have not been made on marketing of fishes as compared to its production. Fish production in Maharashtra is increasing and its disposal pattern is very important as growers, wholesalers, retailers and consumers all are affected due to value addition in the marketing process. For the sustainability of these stakeholders, fish marketing studies are very necessary. Not much work has been done in India on the marketing and supply chain analysis of freshwater fishes. Lots of effort has been made by NFDB (National Fisheries Development Board) to develop the market structure to increase the marketing efficiency. For this they are undertaking construction of modern fish markets which are hygienic and well appealing to consumers. Nowadays majority of consumers give preference to the quality of product even when the prices are higher than the traditional markets. There is a need for improvement in infrastructure, technology and adoption of better management practices in inland fish sector in Maharashtra. Supply chain management is one the key strategies that can reduce various costs associated with processing and can improve the quality and productivity of the product, along with reduction in distributions costs. There is huge demand for fishes like IMC and catfishes like Singhi (*H.fossilis*), Magur (*C.batrachus*) and even Pangasius is gaining popularity in recent years as the catch of these fishes increase from the district tanks and reservoirs. Other fishes like some catfishes (*Notopterus sp*.) and the locally available minor carps are locally preferred by the people belonging to economically weak classes of the society. The locally available minor carps play a major role in meeting the protein requirement of the people. They offer a cheaper source of essential nutrients including protein and fatty acids as compared to chicken, mutton, pork, and beef etc. As Compared to the achievements in fish production, the fish marketing system is very poor and highly inefficient in India[2]. The major problems in marketing include high perishability and bulkiness of the fish, high cost of storage and transportation, no guarantee of quality and quantity of commodity and high price spread[3]. The economy of the Maratwada region of the Maharashtra is based on agriculture and allied activities in general. The Nanded district is endowed with several small and medium reservoirs and riverine belt of Godavari which makes district pertinent for fisheries and act as an integral component of the district and employees several people. In Nanded the Fishery is mainly depends on the tanks and reservoirs present in the district. The total number of tanks in the region accounts for 101(98 below 200 ha & 3 above 200 ha) as a number and 7037 ha as total area. According to Maharashtra fisheries department report, 2012-13 the fish production was about 6000 metric tonnes in Nanded district from all the resources. There was paucity of literature or may be no literature available on the Inland fish marketing system and various supply chains in Maratwada region like Nanded district insight of huge potential. The constraint by fishers studied at 5 blocks Fish market of Nanded where it is observed that the storage facility got 1 rank and has a quotient value of 97.66%.The other constraints like transportation facility (87%), low value got by higher stakeholders (84.66%), scarcity of labor (81.66%), intermediary pressure (80.66%) are some of the important constraints shared by the fishers[4]. Overall no clear empirical study has been conducted to identify the different supply chains and the marketing of fishes in Nanded district. With this background, this study has analyzed the existing marketing structure, marketing channels, market intermediaries, producers share, marketing margins, price spread and marketing efficiency in fish marketing in Nanded district.

The study on selected fish market in Tripura found marketing efficiencies ranging from 51 per cent to 88 per cent, depending upon the length of marketing channel[5]. The effect of post harvest loss on marketing efficiency is also studied with the help of modified efficiency formula[6]. The present study was mainly focused on the domestic fish markets and the outcome which will help the policy makers in formulating appropriate policy for the development of domestic fish marketing system in Maharashtra.

MATERIALS AND METHOD

This research mainly focuses in analyzing marketing of the Fishes in Nanded district of Maharashtra by evaluating the marketing channels, marketing cost price spread, and marketing efficiency of different marketing channels. Both primary and secondary sources of information were used in the study. The primary data was collected with the help of well-structured open-ended pre-tested interview scheduled, whereas the secondary data was collected from various published and unpublished records of government, cooperative societies and other relevant offices. Out of 16 blocks from Nanded district 5 blocks were selected by the recommendation of DFDO of Nanded to represent the whole scenario of district and by following simple random sampling technique from each of selected blocks 4 villages are selected from which the fish catch comes from reservoirs and tanks. There are mainly 30 farmers, 20 wholesalers, 20 Retailers, 30 consumers and 15 Auctioneers and 10 cooperative members were selected i.e. overall 125 samples were selected for the study.

The term marketing efficiency may broadly define as the effectiveness or competence with which a market structure performs its designated function[7]. According to Acharya and Agarwal (2001) the formula for marketing efficiency is as follows:

Acharya's Modified Marketing Efficiency[8]

$$MME = FP/(MC + MM)$$

Where,

MME is modified measure of marketing efficiency

FP is price received by farmers

MC is marketing cost

MM is marketing margin

Producer Share in Consumer Rupee (PS) has calculated as below:

PS =(PF/PR)*100

Where, PF is price received by the farmer

PR is retail price (consumer price)

RESULT AND DISCUSSION

Fish marketing channels in Nanded district, Maharashtra

The fish markets in Nanded lacks basic facilities and infrastructure as like most of the inland fish markets in the country. The major fish markets are present at blocks level. Some of the major fish markets in Nanded are Kandhar fish market, Nanded, Ausa, Degloor, Mukhed, Loha, Biloli, Kinwat etc. Out of these 5 markets were selected for the study. The Nanded is the largest market in terms of transaction of fishes. The fishers and other actors bring their fishes to the Nanded and other markets after proper analyzing the demand and price. The wholesalers are mainly active during morning hours when they dispose their fishes to either retailers or auctioneers. The wholesaler study is mainly done at time of 6:00 Am to 9:00 Am when they are active. The five major fish marketing channels were identified in the study area which has been illustrated below table 1.

Table 1: Different marketing channel in fish markets of Nanded district with disposal percentage

Channel 1	Fishers-Retailers-Consumers	12.46%
Channel 2	Fishers-Wholesalers-Retailers-Consumers	51.12%
Channel 3	Fishers-Auctioneers-Wholesalers-Retailers-Consumers	15.07%
Channel 4	Fishers-Cooperatives-Wholesalers-Retailers-Consumers	7.69%
Channel 5	Fishers-Cooperatives-Auctioneers-Wholesalers-Retailers-Consumers	14.54%

The Table 1 reveals that the channel 1 is the crucial channel for disposal of fishes. This clears that the cooperative are not well organanised in the district and doesn't play much role in marketing of fishes. The cooperative mainly accounts for 21% of the fish marketing in the district. The channel 2 which comprises wholesalers accounts for maximum (51.12%) fish disposal in the district. The 15.07% of the fish is dispose through the channel 3 which comprising auctioneers. The fishers dispense the fishes to auctioneers who sell these fishes either in that particular market or transport it to other market according to price and demand. The fishers sell their fishes in Taluqa fish market like Loha market, Kandhar market, Nanded market, Mukhed market etc.

Marketing cost, margin, price spread and marketing efficiency of Inland Fish marketing in Nanded

Marketing cost is the actual expenses incurred in bringing the goods and services from the producer to the consumer. Marketing cost of any product vary depending on the number of intermediaries involved in marketing chains. The details of cost incurred by all the market intermediaries were analyzed and have been depicted in table 2. The analysis marketing cost is highest for wholesaler (Rs.7.66/Kg) due to high catch handled per day by them. Marketing cost is followed by retailers (Rs.5.40/Kg), owing the involvement of transportation, ice cost etc. The least cost is incurred to the auctioneers (Rs.2.44/Kg) due to minimum transportation cost and ice also minimum ice cost as the auctioneers does not store the fishes in most of the cases. The details of marketing cost incurred at each intermediary have been discussed below:

Table 2: Marketing cost incurred by Intermediaries **Rs. /Kg**

Particulars	Fishers	Cooperatives	Auctioneers	Wholesalers	Retailers
Ice	0.69(14.67)	0.66(12.69)	0.07(2.86)	1.49(19.44)	1.95(35.19)
Transportation	2.87(61.05)	1.96(37.69)	0.47(19.26)	3.31(43.18)	0.97(17.50)
Communication	0.25(5.31)	0.33(6.34)	0.79(32.37)	0.024(0.31)	0.21(3.79)
Packaging	0.54(11.48)	0.56(10.76)		0.31(4.04)	0.25(4.51)
Market fee	0.011(0.23)		0.29(11.88)	0.18(2.34)	0.99(17.87)
Coop.charges	0.34(7.23)	-	-	-	-
Labour	1.69(32.50)	-	0.82(33.60)	1.21(15.78)	-
Rent	-	-	-	0.23(3)	-
Loading/Unload	-	-	-	0.34(4.43)	-
Electricity	-	-	-	0.57(7.43)	0.79(14.25)
Miscillineous	-	-	-	-	0.38(6.85)
Total	4.70	5.20	2.44	7.66	5.54

The fishers incur the cost for commodities like Ice, transportation, communication, packaging, marketing fee, cooperative charge etc. From the percentage cost structure it is quite evident that the fishers pay the maximum cost for transportation (61.05%) followed by the Ice (14.67%), packaging accounted for 11.48 and of the involved cost in whereas cooperative charges and communication cost was 7.23% and 5.23% respectively. The minimum share of market cost was for market fee which was 0.23%. In some blocks like Loha and Mukhed, the cooperatives are well organized and they take responsibility to dispose the fishers catch. They receives the fish from fishermen at reasonable prices like Rs. 40-50/kg for IMC, Rs. 70-80 Rs/kg for high value fishes like Magur, Singhi, fresh water eel etc. The cooperative has to incur marketing cost like labour and packaging cost account for 43.26% total, transportation (37.69%), Ice cost (12.69%) etc. The auctioneers mainly receive the fish from cooperatives or from the fishers directly and then sell it to the intermediary. They sell the fish either in same market or may be in the other nearby market. In the second case they incur transportation cost (19.26%).The total cost incur by the auctioneers was Rs.2.44/Kg.

In this study the wholesalers bear the maximum cost i.e. nearly 30% of the total marketing cost. The wholesalers have to incur the maximum cost in the marketing system because of long distance transportation, cold storage of the fishes and bulk catch handling. The total cost incurred was Rs.7.66/kg. The maximum cost was incurred for the transportation (43.21%) followed by the ice cost (14.44%) and then labour charge (13.04%). The study on the domestic fish markets in Kerala reviled the existence of five different marketing channels which is concurrent with current findings[9]. They reported the marketing cost was most prominent (40%) compare to other intermediaries. For wholesalers another finding concludes that marketing cost for wholesalers was Rs.8.89/Kg for freshwater fishes in Howrah fish market[10]. The total cost incurred by the retailers was Rs.5.54/kg. The fish being a perishable commodity warrants preservation in ice if not sold. This reflects in the cost incurred by retailers accounting a maximum share of 35.19% of the total marketing cost.

The supply chain 1 consist of mainly three actors namely Fishers, retailers, consumers. The fishers dispose their catch directly to the retailers. While disposing the fishers have to incur some marketing cost which is shown in the table 2. The fishers share in consumer rupee is calculated as Rs.69.65 per cent. This channel has the total marketing cost of Rs.10.24/Kg and the marketing margin of Rs. 29.27/Kg. The supply chain 2 is the most important supply chain in the Nanded district because most of the fish (51.12%) is disposed through this channel. The producer's directly handover the fish catch to wholesalers by adding their marketing margin. The wholesalers charge the margin of around Rs.13.95/Kg to the retailers. The total price spread and total marketing cost for this channel are Rs.51.71/Kg and Rs.17.90 respectively. The fishers share in consumer rupee is estimated as 53.17%. The table 3 reveals a direct relationship between length of the marketing channel, marketing cost and marketing margin. The total price spread for this channel is Rs.63.11/Kg. The channel shows the fisher's share in consumer rupee to be 50.91%. The variation in the fishers share in consumer rupee is the result of the presence of intermediaries and their marketing functions. The total marketing cost incurred in this chain 3 is Rs.20.34/Kg whereas the marketing margin is Rs.42.06/Kg.

Table 3: Price Spread of different Supply Chain

Particulars (Rs/Kg)	Supply chain-1	Supply chain-2	Supply chain-3	Supply chain-4	Supply chain-5
Sale Price of fishers	76.91	68.92	65.46	63.86	61.88
Fisher's share in consumer's rupee (%)	69.65	53.17	50.91	46.83	42.34
Marketing cost incurred by fishers	4.70	4.70	4.70	-	-
Price paid by Co-operative	-	-	-	63.86	61.88
Sale Price of Co-operative	-	-	-	86.25	84.72
Marketing cost incurred by Co-operative	-	-	-	5.20	5.20
Marketing margin of Co-operative	-	-	-	17.19	17.64
Price paid by Auctioneer	-	-	70.87	-	84.72
Sale Price of Auctioneer	-	-	82.53	-	98.21
Marketing cost incurred by Auctioneer	-	-	2.44	-	2.44
Marketing margin of Auctioneer	-	-	9.22	-	11.05
Price paid by wholesaler	-	73.90	82.53	86.25	98.21
Sale Price of wholesaler	-	95.51	102.95	108	119
Marketing cost incurred by wholesaler	-	7.66	7.66	7.66	7.66
Marketing margin of wholesaler	-	13.95	12.76	14.09	13.13
Price paid by retailers	81.61	95.51	102.95	108	119
Sale Price of retailers	110.42	120.63	128.57	136.35	146.13
Marketing cost incurred by retailers	5.54	5.54	5.54	5.54	5.54
Marketing margin of retailers	23.27	19.58	20.08	22.81	21.59
Total Price spread	33.51	51.71	63.11	72.49	84.25
Price paid by consumer	110.42	120.63	128.57	136.35	146.13

The studies on marketing costs and marketing margins would be useful to identify the market structure variables that tend to distort effective competition and also the reasons why marketing costs remain high and the services to the consumer is poor in the developing countries[11].The price spread mainly defines the difference between the price paid by the consumer and the price received by the producer. . It was observed that the price spread for marketing of different marine fishes in Kerala[12]. They found the price spread of Rs.44, 84,128 for different fishes in Kerala. The supply chain 1 consist of mainly three actors namely Fishers, retailers, consumers. The fishers dispose their catch directly to the retailers. The fishers share in consumer rupee is calculated as Rs.69.65 per cent. This channel has the total marketing cost of Rs.10.24/Kg and the marketing margin of Rs. 29.27/Kg. The current study is supported by the study of Sathidas*et al*, (1988) where he found fishers share in consumer rupee as (62.40%) in channel consisting of Fisher – retailer and consumer[13]. The supply chain 2 is the most important supply chain in the Nanded district because most of the fish (51.12%) is disposed through this channel. The fishers handovers the fishes to the wholesalers by adding their marketing margin. The wholesalers charge the margin of around Rs.13.95/Kg to the retailers. The total price

spread and total marketing cost for this channel are Rs.51.71/Kg and Rs.17.90 respectively. The fishers share in consumer rupee is estimated as 53.17%. The table 3 reveals a direct relationship between length of the marketing channel, marketing cost and marketing margin. The total price spread for this channel is Rs.63.11/Kg. The channel shows the fisher's share in consumer rupee to be 50.91%. The variation in the fishers share in consumer rupee is the result of the presence of intermediaries and their marketing functions. The total marketing cost incurred in this chain 3 is Rs.20.34/Kg whereas the marketing margin is Rs.42.06/Kg. The table 3 shows that the total price spread for this type of supply chain 4 is Rs. 72.49/Kg. The producers share in consumer rupee is around 46.83%. The total marketing cost and marketing margin of the supply chain are Rs.18.40 and Rs. 54.09/Kg respectively. The marketing margin of retailers (Rs. 22.81/Kg) is found to be maximum and is attributed to because there is less quantity handled by them. The supply chain- 5 is the longest supply chain in the Nanded district containing six actors. The fishers share in the consumer rupee is estimated as 42.34%. The fishers share in consumer rupee shows variations in different supply chains due to various marketing intermediaries and also depends on the point of production/fish catch and the point of consumption. The total marketing cost of supply chain 5 is found to be Rs.20.84/Kg and total marketing margin for the same is found to be Rs.63.41/Kg.

Marketing efficiency

Table 4: Marketing efficiency by Acharya and Aggarwal method (2001)

Particulars	**Channel-1**	**Channel-2**	**Channel-3**	**Channel-4**	**Channel-5**
Fishers Price	76.91	68.92	65.46	63.86	61.88
Price Spread(MC+MM)	33.51	51.71	62.4	72.49	84.25
Marketing efficiency	2.29	1.33	1.03	0.88	0.73

(MC= Marketing cost, MM= Marketing margin)

Marketing efficiency measures indicate how efficiently the produce is marketed in a given channel. The results of market efficiencies calculated conventionally as a ratio between value addition by the market system and consumers/retailers price, following Acharya's modified methods and are presented in table 4. To calculate the marketing efficiency of any channel, one needs to estimate the marketing cost, margin and price spread of the supply chain. The marketing efficiency depends on length of the channel, Price received by the fishers, marketing margin, and cost have strong bearing efficiency. The above mentioned parameters have direct or indirect relationship with the marketing efficiency. The above study emphasizes the fact that the lesser the channel length higher the marketing efficiency. The findings of the current study are on same lines further stressing upon the direct relationship between channel length and market cost and inverse relationship between length of channels and fishers share in consumer rupees.

The marketing channel 1 is having only three intermediaries, and marketing efficiency is high. The Improvement in pricing efficiency has been reflected in channel 1in terms of lower price-spread, higher efficiency index, increased producers' share and lower consumers' price. In this channel the fishers share in consumer rupee is highest i.e.69.65%. To increases the profitability, the fishers should undertake marketing through the channel 1. But the main problem faced in this channel is that the retailers do not give the immediate payment. The delayed payment made by retailer's forces fishers to dispose

their fishes through other marketing channels. The marketing efficiency of channel 1 is 2.29 which are highest as compare to other marketing channels. The table 4 gives the comparison of marketing efficiency of different channels.

The channel 2 has intermediaries like fishers, wholesalers, retailers and consumers. The relatively longer length of the channel pushes the marketing cost towards higher size affecting marketing efficiency of this channel. Majority of the fishers (51%) prefer this channel to dispose their catch due to instant payment from the wholesalers. The marketing efficiency of this channel estimated as1.33. The channel third has the extra intermediary i.e. auctioneers who charge its margin and add its cost to the marketing channel reducing the marketing efficiency. The fishers are mainly travels to nearby markets at dispose their catch to the auctioneers at certain cost. The marketing efficiency of this channel is found to be 1.03. The channel fourth has their marketing through the cooperatives. The marketing cost of cooperative is quite high substantially decreasing the marketing efficiency. In this channel, the cooperatives purchase the fishes in bulk from fishers and dispose them to wholesalers. The marketing efficiency of this channel is 0.88 more or less as similar to channel 3 owing the similar numbers of intermediaries. The wholesalers are having the cold storage facility to store the fishes for a longer duration. They employ labour for sorting, grading, loading and unloading etc. The efficiency of the channel fifth is low to the length of the channel is large. The total marketing cost of this channel is highest due to more number of intermediaries present. The calculated marketing efficiency of this channel is 0.73.

CONCLUSION

The investigation concluded the existence of five marketing channel in the district and based on the quantity handled channel 2 was found out be the major channel with share of 51.12 percent. The wholesaler seems to be the key actor based on their involvement in the different exiting channel and quantity handled, it was found wholesalers involved in 73.88 percent of total fish handled in the district. But from the marketing cost study it revealed that wholesalers incurred the highest marketing cost of Rs.7.66/kg compared to other actor. The transportation was found to be major cost components for all market intermediaries except retailers in which it was found to be icing. Hence there is need to find strategies and efficient marketing system that will reduce transportation cost which will benefit all the intermediaries and yield higher profit. With marketing efficiency of 2.29 and price spread of Rs.33.51 channel 1found to be most efficient channel, which cost of only three intermediaries. Hence it proves that general understanding of shorter the marketing channel higher the marketing efficiency. The marketing system in Nanded district found to unorganized and unregulated, hence the finding of this study will be great significance for policy makers in working out a systematic blueprint of organized marketing system in the district which will enable the beneficiaries to reduce cost and maximize profit for achieving competitive advantage.

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