Fish Marketing in *Chaur* Areas of Bihar - A Study of Disposal Pattern, Price Spread and Marketing Efficiency

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Abstract

Chaurs are the flood plains or the shallow transitional lands in Northern Bihar, which act as nurturing grounds for large amount of fish resources. Both culture and capture fisheries are practiced in this area. The study was intended to identify prevailing marketing channels as well as to estimate the price spread and marketing efficiency of the channels. Three marketing channels operate in disposing of fish from *chaur* areas. The channel-first, which involves direct marketing of fish from producers to consumers, was the shortest and most efficient with market efficiency of 69.7 and price spread of Rs.2.12 kg^{-1}. Most of the catch (90.7%) of culture fishery and 52.6% of capture fisheries were disposed of through the channel-II, where vendors act as intermediaries. Only 3.5% of cultured fish was sold in distant wholesale market through channel-III. Channel-III was found to be the least efficient. Distant markets have higher disposal capacity and price realisation better this marketing channel and hence needs to be tapped by organising producers in the form of marketing cooperatives.

Keywords: *Chaur*, producers' share in consumers' rupee, disposal pattern, modified marketing efficiency

Introduction

The flood plains in the form of tectonic lakes (*chaurs*) between river Gandak and Koshi in North Bihar have the distinction of nurturing huge quantity of open-water fishery resources. *Chaurs* are shallow transitional lands, left with enough fish once the flood recedes. It can support lucrative fisheries without much inputs. However, average yield of fisheries practiced in *chaurs* of Bihar was about 40-50 kg^{-1} ha^{-1}yr^{-1} during 2007 (Govt. of Bihar, 2008). Majority of the catch from capture fisheries includes carps such as *Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*, *Cirrhinus reba*, *Ctenopharyngodon idella* and *Cyprinus carpio.* Barbs such as *Puntius ticto* and *P. sophore* are caught in plenty during the post monsoon season. Other fish species caught include *Clarias batrachus*, *Heteropneustes fossilis*, *Channa striatus*, *Glossogobius giuris*, *Mystus seenghala*, *Anabas testudineus* etc. Culture fishery exists mainly for Indian major carps and Chinese major carps. Some farmers have recently started culturing *Pangasius hypopthalmus*. Major catch from capture fishery comes during September to mid October and culture fishery starts once the monsoon water recedes and continues till March.

Fish being perishable in nature, its marketing is of major concern among the farmers/fishers. Therefore, efficient marketing strategy for proper disposal of fish is imperative. The fish as a commodity passes through multi-layered marketing system, and at each level there is some transaction cost and profit margin. The time gap can results in deterioration of quality of fish and ultimately lower price in the market. Identification of efficient marketing channel for distribution of fish is necessary for improving the quality of fish and profit margin to fish farmer/fishers. Keeping in view the availability of the potential resources, it is a matter of great concern for the planners and policy makers to develop efficient marketing system to improve returns for the welfare of fishers/fish farmers. Being one of the richest districts in availability of *chaurs*, the present study was undertaken in Samastipur district of

Bihar to analyse economics of marketing of fish and to identify efficient marketing channel.

Materials and Methods

The study was based on primary data collected from different stakeholders in fish marketing using personal interview method with the help of pre-tested questionnaire specially designed for the study. The study was conducted at *chaur* and market level for both the capture and culture fisheries. Sample stakeholders in fish marketing at various levels were selected using multistage stratified random sampling technique. For the study, 83 producers (52 fishers and 31 fish farmers) from 6 different *chaurs* namely Sonmar, Manika-Manikpur-Mauhadinagar, Dumardah, Malpur-Matihani, Mahisar and Basai-Mahnai *chaurs*, 20 wholesalers from 4 different wholesale markets at Samastipur, Dalsingsarai, Rosera and Patna, 20 retailers from 2 different retail markets at Samastipur and Patna and 30 vendors locally known as *paikars* at Samastipur were selected randomly (Table 1).

Table 1. Distribution of sample Market Intermediaries

Intermediaries	Market	Sample size
Producers		
a. Fish Farmers	6 different chaurs	31
b. Fishers	6 different chaurs	52
Wholesalers	Samastipur	5
	Dalsingsarai	5
	Rosera	5
	Patna	5
	Total	20
Retailers	Samastipur	10
	Patna	10
	Total	20
Paikars (Vendors)	Samastipur	30
	Grand Total	153

The data collected for the study pertained to the agricultural year 2011-12. Besides simple statistical tools such as average and percentage, measures of marketing cost, marketing margin, price spread, producers' share in consumers' rupee and marketing efficiency as per Acharya & Agarwal (2004) were used to meet objectives of the study.

Price spread connotes gross margin or mark-up in the marketing of farm commodities and is measured as absolute or percentage difference in the price received by the farmers/producers (Acharya & Agarwal, 2004). This can be expressed as-

Price spread (PS)

= Price paid by the consumer (PC) − Price received by the producer (PF)

Producers' share in consumers' rupee is the price received by the farmer expressed as percentage of the consumer's price (i.e., the price paid by the consumer). This can be expressed as follows:

$$PS = (PF/PC)100$$

Where PS = producer's share in consumer's rupee

PF = Price received by the farmer/producer

PC = Price paid by the consumers

According to Acharya & Agarwal (2004) an ideal measure of marketing efficiency particularly for comparing the efficiency of alternate marketing channels should be such which takes into account all of the following:

$$MME = \frac{PF}{(MC + MM)}$$

Where, MME = Modified Measure of Efficiency, PF = Price received by the farmers, MC = Marketing cost and MM = Marketing margin.

Results and Discussion

The disposal pattern of fish catch by fishers and farmers of the *chaurs* has been worked out and presented in Table 2 for cultured fishes and in Table 3 for capture fishes. In case of cultured fishes, 1.87% of total produce was used for consumption at home, 8% was distributed among fishers as harvesting charges and balance 90.13% of total produce was sold to different agencies. Out of the total marketed surplus, about 90.7% were sold at farm/*chaur* to vendors locally known as *paikars* and 5.8% directly to local consumers. Only 3.5% of total marketed surplus was sold in market to wholesalers. In case of captured fishes, 7.9% of total fish catch was consumed at household, 6.4% was distributed as wage or remuneration among fishers and balance 85.6% was sold to different marketing intermediaries (Table 4). In this case out of the total marketed surplus, 52.6% was sold to vendors locally known as *paikars* and 19.3% to agents of wholesalers at

Table 2. Disposal Pattern of Culture Fisheries

(Quantity in kg)

	Particulars	Overall
Area of production	Total Production	1,44,365.7 (100.0)
	Consumed at household	2,705.0 (1.9)
	Paid in wages	11,549.26 (8.0)
	Marketable surplus	1,30,111.4 (90.1)
Sold in market		
	Wholesaler	4,500 (3.5)
Sold at farm site		
	Vendor	1,18,061.4 (90.7)
	Consumer	7,550 (5.8)

Note: figures in parenthesis indicate their respective percentages to total production

Table 3. Disposal Pattern of Capture Fisheries

(Quantity in kg)

Particulars	Disposable Pattern
Area of *chaur* (ha)	1,151.2
Total Production	4,04,730 (100)
Household consumption	32,210 (7.9)
Paid in wages	26,154 (6.4)
Marketable surplus	3,46,370 (85.6)
Sold at point of production	
Wholesaler	66,854 (19.3)
Vendor	1,82,350 (52.6)
Consumer	97,168 (28.1)

Note: figures in parenthesis indicate their respective percentages to total production

point of production. Most of the catch from capture fisheries was caught during a short period of time from September to mid October and the quantity of landing was high enough to attract wholesalers at the landing site. While in case of culture fisheries, harvesting was spread over a period of 6-7 months and amount of harvest during any specific time period was small and non-predictable and hence sale to wholesaler was low in comparison to capture fisheries. Most of the fishers catch fish and sell it to ultimate consumer at the point of production as well as by taking the fishes to the doorsteps of consumer either on head or on bicycle. It account for about 28.1% of total marketed surplus. Jha (2009) also found that about 23.75% of the fishers sold their fishes directly to consumers followed by 25.83% to middlemen and 28.12% to commission agents.

Marketing channel is a communication path through which a product passes from producer to the ultimate consumer. Producers (Farmers/Fishers), wholesalers, retailers and vendors were important intermediaries working in the disposal of fish in the study area. Three marketing channels were found operating for disposal of fish from production site to consumer (Table 4). Channel-I consisted of only two players where producers sell their produce directly to consumers. On overall basis, 21.9% of total marketable surplus of fish on sample households was getting disposed off through channel-I. Channel-II consisted of three players including producer, vendor and consumer. Vendor after purchasing fish from farmers/fishers were selling to consumers on their doorstep either on bicycle or by foot. This was the most popular channel for marketing of *chaur* fishes. Maximum quantity (63.1%) of marketable surplus on sample households was getting disposed off through the channel. Channel-III was the longest, consisting of four players including fisher/farmer, wholesaler, retailer and consumer. In this chain, either the producer carries their produce to distant wholesale market or wholesaler work through agent at the point of production. Only about 15% of total marketable surplus of fish on sample households was getting disposed off through this channel.

Movement of fish from point of production to point of consumption involves some cost for performing several activities like transportation, loading and unloading, icing of fish and establishment charges of shops and other miscellaneous expenditures. The cost incurred for performing several marketing

Table 4. Marketing Channel

Sl. No.	Marketing Channels	Quantity Disposed (% of marketable surplus)		
		(Culture Fisheries)	(Capture Fisheries)	Overall
I.	Producer → Consumer	5.8	28.1	21.9
II.	Producer → Vendor → Consumer	90.7	52.6	63.1
III.	Producer → Wholesaler → Retailer → Consumer	3.5	19.3	15.0

Table 5. Marketing cost incurred at various level (Rs. Kg^{-1})

Cost component	Farmer	Wholesaler	Retailer	Vendor
Fixed Cost	0 (0)	0.27 (3.9)	0.5 (4.6)	0.89 (6.6)
Labour Charges	0 (0)	2.83 (41)	8.47 (77.2)	10.5 (77.7)
Loading/Unloading	0.37 (8.4)	0 (0)	0 (0)	0 (0)
Transportation	3.91 (88.7)	0 (0)	1.32 (12)	0.26 (1.9)
Telecommunication	0 (0)	0.06 (0.9)	0 (0)	0.64 (4.7)
Mandi Fee	0 (0)	0.14 (2)	0(0)	0 (0)
Ice Cost	0 (0)	3.07 (44.4)	0(0)	0 (0)
Electricity	0 (0)	0.31 (4.5)	0 (0)	0 (0)
Hygiene Cost	0 (0)	0.04 (0.6)	0 (0)	0 (0)
Miscellaneous	0.13 (2.9)	0.19 (2.7)	0.68 (6.2)	1.23 (9.1)
Total Marketing Cost	4.41 (100)	6.91 (100)	10.97 (100)	13.52 (100)

Note: figures in parenthesis indicate their respective percentages to total cost

functions has been estimated and is presented in Table 5. Farmers incurred a total of Rs. 4.41 kg^{-1} as marketing cost in channel-III out of which 88.7% was for transportation. The marketing cost at wholesaler, retailer and vendor level were Rs.6.91, Rs.10.97 and Rs.13.52 kg^{-1} respectively.

Price spread refers to the difference between the price paid by consumer and the price received by producer for equivalent quantity of fish. It consists of marketing costs and marketing margins of intermediaries, which ultimately determine the overall effectiveness of the marketing system (Acharya & Agarwal, 2004). The price spread analysis was performed for all the marketing channels and results are presented in Table 6. Channel-I was the shortest and had the highest efficiency (69.7%). The results showed that farmers/fishers when sold their produce directly to consumer received highest price of Rs.149.9 kg^{-1} in marketing channel-I. Price spread for marketing channel-I was Rs.2.1 Kg^{-1} as cost of marketing. The lower price (Rs.136.3 kg^{-1}) was received when they sold to vendors with Rs.13.52 kg^{-1} marketing cost in marketing channel-II. The price spread for channel-II was Rs.23.2 Kg^{-1} with modified marketing efficiency 5.9. Marketing channel-III was least efficient with 2.4 marketing efficiency and price spread of Rs.55.8 kg^{-1}. The producers' share in consumer's rupee was 70.6% with marketing margin Rs.33.4 kg^{-1} and marketing cost of Rs.22.4 kg^{-1} in marketing channel-III. However, Kumar et al. (2008) found 34.5 - 63.8% producer's share in consumer's rupee and Alam et al. (2010) in Bangladesh also estimated 30-40% producers share in consumer's rupee which is contradictory to the present study. Jayaraman et al. (1993) estimated producer's share in consumer's rupee which varied from 36 to 72%. The reason behind higher share of producers in consumer's rupee in present study may be due to

Table 6. Price Spread analysis for different Marketing channel

Particulars	Marketing Channel -I (Rs. kg^{-1})	Marketing Channel-II (Rs. kg^{-1})	Marketing Channel-III (Rs. kg^{1})
Sale price of producer	149.9	149.9	138.3
Marketing cost of producer	2.12	13.6	4.4
Net price received by producer	147.8	136.3	133.9
Marketing cost of wholesalers			6.9
Net marketing margin of wholesalers			21.1
Purchase price of retailers			166.3
Marketing cost of retailers			10.9
Net marketing margin of retailers			12.4
Sale price of retailers			189.7
Marketing cost of vendor		13.52	
Net marketing margin of vendor		9.7	
Consumer's price	149.9	159.4	189.7
Price spread	2.12	23.2	55.7
Total marketing cost	2.12	13.5	22.3
Total marketing margin	0.0	9.7	33.4
Marketing efficiency	69.7	5.9	2.4

shorter supply chain operating in the *chaur* area and most of the fish was being sold directly either to the vendors or the consumers. Vendors sold it directly to consumers whereas supply chain in Alam's study was longer leading to higher share of middlemen. Bukenya et al. (2012) estimated marketing margin of 19.32% for wholesalers and 16.67% for retailers that was similar to the result of the present study. Srinivasan (1985) estimated marketing cost and price spread in Tamil Nadu that varied from 70 to 100%.

Though channel-I was most efficient and profitable for fishers/fish farmers, maximum quantity of fish was getting disposed of through marketing channel-II. This may be due to lack of adequate demand at the point of production from consumers and hence channel-I was not able to dispose of all the fishes produced in *chaurs*. Some of the progressive farmers had sold their fish in distant Patna wholesale market due to low demand and lower price in local market. Upon comparing marketing cost of fisher/farmer in channel–II and channel-III, it is clear that real cost of marketing for the producer in distant market was low in channel-III (Rs.4.4 kg^{-1}) as compared to

channel-II (Rs.13.6 kg^{-1}). If the fish sold in channel-II can be sold in Patna market through producers cooperative directly without involving any marketing intermediary even at the price of that realised in channel-I for selling in local market, producer will get additional profit of about Rs.9 kg^{-1} (after deducting marketing cost). This illustrates the benefit of selling in distant market, but small quantity cannot be transported to distant market. Therefore, collective action on part of fishers/ fish farmers is required for marketing their produce collectively in bulk to distant market like Patna where price of fish generally rule higher than the local market. Kumar et al. (2008) identified eight marketing channel operating in Kolleru lake area in Andhra Pradesh and estimated marketing efficiency of 2.11, 1.89 and 2.50 which was almost similar to the present study (2.4 and 5.9). Kumar et al. (2008) worked out marketing efficiencies for Indian major carps, sardine and seer fish that varied from 34 to 74%, depending on the length of marketing channel in India. Sathiadhas & Kangam (2000) in India, Sathiadhas & Panikar (1988) and Senthilathiban & Selvaraj (1992) in Tamil Nadu and Shirke (2010) in Mumbai found similar result as of present study.

Khobragade & Sonawane (2004) reported higher profit margin to the market intermediaries than the marketing cost which was Rs. 1.55 kg⁻¹ for wholesaler and Rs. 2.60 kg⁻¹ for retailer in Mumbai was similar to the present study where marketing margin was higher than the marketing cost.

From the study, it is evident that among the three prevailing marketing channels for fish, marketing channel-I was the most efficient with least price spread but had limited disposal capacity. In terms of disposal capacity, marketing channel II was the most prevalent channel both for culture and capture fisheries. To increase the farmers' profit when marketing through channel II, appropriate measures should be taken to check the malpractices of taking one kilogram extra at a purchase of every ten kilogram by vendors. Marketing channel-III, involving wholesalers disposes very small share (3.5%) of the total produce. Since, distant market had higher disposal capacity, organising producers in the form of marketing cooperatives will help them to market their produce directly to distant markets and realise higher price over the existing price realised by selling at production site.

Acknowledgement

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