Fish marketing system in the Chalan *Beel* area in north-west Bangladesh

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Abstract: A study has been carried out in the Chalan *beel*, the largest natural depression in the North-West Bangladesh to identify threat, potentialities and scope of opportunities of current fish marketing system. Questionnaire interview and focus group discussion (FGD) were employed to gather information from fishermen, *beparies*, *aratders*/wholesalers, retailers, consumers and commission agents who were regulating the fish marketing channel collectively. A fluctuation of fish price was a regular phenomenon depending on supply and demand, species and quality. Among the most abundant fishes *Wallago attu, Labeo rohita, Catla catla, Chanda spp, Heteropneustes fossilis,* and *Mystus spp.* showed significant ($P<0.05$) differences in price. For fish transportation, traders used both traditional and improved system and packaging materials with ice and fish ratio as 1:1 to 1:4 depending on fish species, season and distance. The fishers, *beparies* and retailers used local vehicle- *Nosimon*, *Karimon*, Van, *Ricksha*, train, truck and buses for transportation of fishes. The major constraints of fish marketing were higher transport cost, poor road, and lack of ice, exploitation of middlemen. If proper and adequate steps could be taken to improve marketing system then the fish business would be more profitable ensuring a better life and more sustainable livelihood for the stakeholders involved in Chalan *beel* fish marketing.

Key words: Chalan *beel*, marketing channel, abundant fishes, middlemen, fish price fluctuation.

Introduction

Chalan *beel* is the largest and most important watershed in North-West Bangladesh. It comprises a series of depressions interconnected by numerous channels to form more or less one continuous sheet of water during monsoon covering an area of about 375 km^2. During the dry season, the water area decreases down to 52-78 km^2 and looks like a cluster of small *beels* of different sizes (Banglapedia, 2004). It is still an abode of large variety of fish, aquatic invertebrates, birds and others aquatic animals contributing to local economy and peoples' livelihood. It serves the livelihoods of about five million people by providing fish and aquatic products, agricultural crops, and pasture lands for livestock. Despite the fact that Chalan *beel* has a great impact on the local landscapes and peoples' livelihoods, no systematic research and/or management strategies have been implemented so far. The fishes of Chalan *beel* play an important role in the socio-economic condition of the people and the poor fishers in this area. Current fish production in the Chalan *beel* is 11,000 mt. which could be increased to 45,000 mts. with an improved management practices (Karim, 2003). To get real benefit from this production of the *beel,* it is very much important to identify the marketing channel, potentialities, threat, storage facilities, transportation and packaging, price of fishes and its seasonal variation. The present study has been undertaken to know the marketing system (marketing channels, personnel involved in the marketing system, prices variation, transportation system, fish preservation method) of Chalan *beel* area.

Materials and Methods

The Chalan *beel*, under the present investigation is located between 24.35^{o} to 24.70^{o} North latitude and between 89.10^{o} to 89.35^{o} East longitudes (Fig.1). Historically the *beel* spreads over three upazilas (Sub-districts) of Rajshahi district (Paba, Bagmara and Mohonpur), three upazilas of Pabna district (Chatmohor, Vangura and Faridpur), four upazilas of Sirajganj district (Tarash, Ullapara, Raigonj and Shahjadpur), four upazilas of Natore district (Sadar, Singra, Gurudaspur and Baraigram), three upazilas of Naogaon district (Manda, Raninagar and Atrai) and one upazila of Bogra district (Nandigram). Now the area of the *beel* has been decreased due to criss-cross roads and dams' construction in and around the Chalan *beel*. The present *beel* is confined to partial or total area of the upazila of Singra, Gurudaspur, Boraigram under Natore, Chatmohor, Bhangura, Faridpur under Pabna and Shahjadpur, Ullapara, Tarash and Raigong under Sirajgnj district. The study was conducted in two landing centres and two fish markets (Table 1) located in Chalan *beel* area under the districts of Sirajganj and Pabna (Fig.1). Data were collected during July to December, 2008 by monthly market survey from different stakeholders in the fish markets through a well structured pre-tested questionnaire. For this purpose, 3 *aratdars*, 2 fishermen and 2 commissioning agents in each study site per survey were randomly selected on the spot and focus group discussion (FGD) were made with 10 participants per batch. A total of 20 surveys and 16 FGDs (4 in each sites) were conducted in four different study sites. Emphasis on the fish species diversity and marketing channel, personnel involved in the total process, price, preservation and transportation facilities was given during data collection. After collecting the data, it was cross-checked with key informants such as, Upazila Fisheries Officer (UFO), and relevant NGO workers. Data with locally used unit and percentages were manipulated for further analyses. Spreadsheets were compared with the notebook where data were collected

at the first place. The analyses were done using Microsoft Excel and SPSS.

Table.1. Data collection sites of the Chalan *beel*

Study sites	Location	Catchement area	Market hour
Mohisluti fish landing centre (S_1)	Tarash, Sirajganj	47 *beel* and 10 river	6-10 am
Boral bridge fish landing centre (S_2)	Bhangura, Pabna	35 *beel* and 7 river	3-6 am
Bhangura fish market(S_3)	Bhangura, Pabna	15 *beel* and 4 river	8-11am
Chatmohor Fish Market (S_4)	Chatmohor, Pabna	15 *beel* and 7 river	8-11 am

Fig.1. Four study sites in the Chalan *Beel* area.

Results and Discussion

Marketing Channel in Chalan *Beel*

In the Chalan *beel*, the fish marketing channel from fishers/farmers to consumers passes through a number of intermediaries like local fish traders, agents, wholesalers and retailers (Fig.2). Sometimes, a single person was found to perform a dual job depending on the supply and availability of fish and season. Rokeya *et al.* (1997) found that there were five different groups such as- Local agent (*dalal*), money lender (*Mahajans*), retailers (*nicary*), wholesalers (*paiker*), distributors (*bapary*) and commission agent (*aratdar*) involved as intermediaries in the distribution network from producer to consumer in Rajshahi fish market. Presence of intermediaries in the marketing channel similar to the present study has also been reported in India by (Ahmed, 1984).

Fishers

In Chalan *beel* area, a group of people who harvest fishes directly from a water body such as flood plains, rivers, ponds, canals, ditches etc are categorized as fishers. They are busy in catching fish by their own fishing gear, and some are daily labours who have no boat and gear of their own for fishing. There were a significant ($P<0.05$) difference in the number of fishers in four study sites. The mean number of fishermen was 276 ± 71, 238 ± 71, 94 ± 30 and 138 ± 30 in S_1, S_2, S_3 and S_4, respectively during the study period. The common phenomena of the fishers were to sell their catch to the *aratdar* (wholesaler) because the poor fishers of the Chalan *beel* area borrowed money from the *aratdar* in needs and were bound to sell their fish to them with a comparatively cheaper rate.

Wholesalers

In Chalan *beel*, the wholesalers *(aratdar)* accumulate the catches directly from the fishermen or indirectly through commission agents *(dalal)*. In S_1, S_2, S_3 and S_4 the mean number of *aratdar* were 51.40 ± 6.67, 30.20 ± 3.03, 4.80 ± 2.87 and 9.20 ± 1.79, respectively and there was a significant ($P< 0.05$) difference in the number of *aratdars* among the study sites and months. The percentages of sales of the fish of Chalan *beel* by different tiers of the channel are presented in the fish marketing channel (Fig.2.). Infact, *aratdars* acted as a medium for selling fish. They normally possessed fixed establishment in the fish markets and gave

shelter not only to the fishers but also to the *baperies* or retailers to facilitate them in the process of fish marketing. Parween *et al.* (1996) found the similar trends in the fish markets of Natore and Nawabgang districts.

Beparies

Beparies were the professional traders in the study spots, especially in the two landing centres. They purchased their fish from the *aratdar* directly or by commissioning agents. In S_1, S_2, S_3 and S_4 the mean number of *beparies* were 14.40±3.78, 12.80±2.28, 4.8±2.64 and 6.40±2.51, respectively. There was a significant (P<0.05) difference in the number of *beparies* in different sites and months during the study period. B*eparies* transported 99% of their fish to different places of the country for selling and only 1% in the spot directly to the consumers or retailers. Mia (1996) identified more or less the same marketing channels in Mymensingh district.

Fig.2. Flowchart showing the fish marketing channel in the Chalan *beel* area.

Retailers and Consumers

Retailers are those persons who buy fishes directly from fishers, wholesalers or from *beparies* or indirectly through commission agents and sell the fishes to the ultimate consumers. The function of retailers is to procure supply and display them in suitable forms and at convenient times for the consumers. Usually, retailers buy fishes through open auction. In this study, the retailers were found only in the fish markets to sell the fishes to the consumers, but in the two fish landing centres, retailers bought fishes from the *arotdar* and sold their fishes in the adjacent local retail markets. In the Chatmohor and Bhangura fish market; there were 60 and 50 retailers, respectively, but the number was found double in the peak-harvesting season. Consumers are the ending point of the marketing channel. The people who purchase fish from the market for their household consumption are considered as consumer. In the survey markets, on average there were 250 - 300 consumers to purchase their fish daily.

Commission agents

Commission agents are a kind of personnel who deal without capital. They do not buy fish for their own selling purpose. In the fish marketing channel of Chalan *beel* area, they were common in the marketing channel. They sell fish to the *aratdar, baperies* and retailers on behalf of the fishers or fish farmers and take percentage as commission for their services. The rate of commission varies with the variety and quantity of fishes available in the market. The mean number of commissioning agent had been found 47.00±9.75, 32.00±8.37, 4.40±2.30 and 14.40±3.78 in St.S-1, St.S-2, St.S-3, and St.S-4, respectively and it showed a significant difference (*P* < 0.05). Khan (1995) found commission agents in the fish market of Netrokona and Mymensingh town. Rokeya *et al.* (1997) also

mentioned the presence of commission agents in the fish distribution network of Rajshahi.

Handling, Packaging, Processing and Transportation of Fish

In the Chalan *beel* area handling of fishes started at farmer level - through washing, sorting, grading, and transportation to landing centers. The commercial or large-scale fishers caught fish overnight and accumulated all of their fishes and deposited in a specific place of boat. At the early morning the commercial fishers stop their fishing activities and washed their fish. The other stages of handling were conducted at the landing centre by – grading, sorting, icing, and packaging after auctioning. These processes were performed within 3-4 hours depending on the season and amount of catches. Sorting of fishes was done according to the species and size of fishes. Sorting out of SIS was very laborious and time consuming. Generally, SIS catch was mixed but the value of all the species was not same. For this reason, the *baperies* sorted out the mixed SIS, but many times it was over looked.   Skilled personnel did these activities. In case of large fish, sorting was very easy. However, large fishes needed grading according to size, because price variation depended on the size of fishes. There were icing facilities in all the spots of the study area. After grading and sorting, the *baperies* mixed the fishes with adequate ice. Normally, they used ice: fish at the ratio of 1:1 to 1:4 for handling of fishes based on seasons and ultimate destination of the fishes. Ice was used when fishers kept fishes in shelter, and packed them for transportation to the long distances. Parween *et al.* (1996) found that much wastage of the commodity occurs due to the poor methods of packaging and transportation in Natore and Nawabgang districts when fishermen normally sell their catch to commission agents or wholesalers. In Challan *beel* for packaging fish, they (*baperies*) used separate methods for large fishes and SIS. For larger one, they arranged the fish in basket with a size order keeping the head vertically at the opening of the basket. Before that, they kept a sheet of polythene inside the basket to make the basket air proof. The polythene covering acted as insulators which protected ice from melting. Then they spread a layer of small piece of ice over the polythene. After that again a layer of fish was arranged in previous order and followed by a layer of ice. This process continued until the basket became filled with fish. At last, they spread a thick layer of ice and then covered with Banana leaves. Finally, they covered the basket with a thick and wet sack and tied with rope tightly. Then the basket was ready for transportation for 8-10 hrs distances. In case of SIS, the processing method was quite different. For SIS they used polythene bag for short distances, but for longer distances bamboo made basket were used. . For SIS they mixed the fishes with ice before packaging. Normally, for SIS they used ice: fish at the ratio of 1:1. Rokeya *et al.* (1997) found that the packing materials

used for carrying the fishes were mainly wooden box, bamboo basket, earthen pot, aluminium can, drum etc. in Rajshahi. The author also found that banana leaves and aquatic weed were usually used as ancillary packing materials. In Chalan *beel*, the packaged fishes were transported to distant places using mechanical vehicle like track, tempo, pickup, bus, and sometimes by boats. Siddique (2001) found that the transportation facilities like boat, push-cart, rickshaw, van etc. were used to carry fishes by the fishermen while train, rickshaw, push-cart etc. were used by the intermediaries in Mymensingh which is more or less similar to our present findings.

Price of Fishes

The price of fishes in the Chalan *beel* area fluctuated abnormally due to various factors such as increasing or decreasing supply, increasing or decreasing demand, season, species of fish and the quality of fish. There were significant ($P<0.05$) differences of price of all the ten most abundant species except *Puntius* spp., *Channa punctatus* and *Labeo calbasu* in the study sites during the observation months. On the other hand, out of the ten least abundant (less than 2 kg) fishes two species (*Channa marulius* and *Nandus nandus*) showed significant ($P<0.05$) differences in their abundance in the study sites. The average price (kg) of the highest and lowest available ten fish species are shown in Tables. 2. Rahman (1997) observed that the price of fish varied with the species and size of fish, season of the year and with the location. Siddique (2001) found that there were seasonal variation in fish price in Mymensingh region with the highest in summer (March to May) and the lowest in winter (November to December) that supported the present findings.

Conclusion

A number of constraints such as high transport cost, poor road and transport facilities, poor supply of ice, exploitation by middlemen, inadequate drainage system, poor water supply, poor sanitary facilities, unhygienic condition and political disturbances were identified in fish marketing system in the Chalan *beel*. Proper arrangement should be made by government so that the producers and other stakeholders can get reasonable and stable profit margin and the consumers can get the real value for their money when they buy fish. Strengthening law-enforcing agencies in fish marketing area was also suggested. If proper and adequate steps could be taken to improve fish marketing system then the business would be more profitable which will ensure uplifted socioeconomic and better sustainable livelihood of the people involved in the fish marketing in Chalan *beel* area.

Table.2. Average price (Taka kg^{-1} with mean ± standard deviation) of abundant and least abundant fishes months in different seasons in the Chalan *beel* area

a. Abundant species:

Fish	August	September	October	November	December
Wallago attu	156.3±9.5	133.8±4.8	112.5±5.0	115.0±5.8	155.0±5.8
Labeo rohita	115.0±5.8	102.5±49.3	80.0±0.4	92.5±5.3	115.0±5.8
Catla catla	115.0±5.8	105.0±5.8	90.0±8.2	82.5±5.2	95.0±5.8
Puntius spp	38.8±4.8	31.3±2.5	26.3±2.5	25.0±1.2	31.3±2.5
Chanda spp	31.3±2.5	41.3±2.5	30.0±20.0	25.0±2.1	10.0±20.0
Channa punctatus	41.3±2.5	42.5±2.9	37.5±2.9	41.3±8.5	43.8±2.5
Mystus spp	55.0±4.1	60.00±4.1	52.5±2.9	52.0±2.9	57.0±2.9
Heteropneustes fossilis	247.5±15.3	215.0±5.8	133.8±69.7	170.0±8.2	162.5±5.0
Labeo calbasu	107.5±9.6	105.0±5.8	100.0±8.2	97.50±9.6	105.0±5.8
Glossogobius giuris	40.0±4.1	40.0±4.1	32.5±2.9	37.5±2.9	45.0±4.3

b. Least abundant species:

Fish	August	September	October	November	December
Labeo ariza	72.5± 5.0	55.0± 36.9	76.3± 7.5	85.0± 5.8	85.0±5.8
Chitala chitala	157.5± 5.0	80.0±92.7	112.5±75.4	157.5± 9.6	150.0±83.7
Notopterus notopterus	42.5± 49.3	87.5±5.0	62.5±41.9	100.0± 8.2	75.0±50.0
Channa marulius	120.0± 3.1	122.5±81.8	145± 5.8	75.0±86.6	152.5±5.0
Nandus nandus	52.5± 5.0	12.5±25.0	40.0± 3.3	46.3±2.5	46.3± 2.5
Eutropiichthys vacha	247.5±165.6	230.0±153.6	272.5±22.2	215±143.6	300.0± 2.37
Ompok pabo	125.0± 250.0	205.0±236.9	475±28.9	450.00± 57.7	500.0± 12.3
Neotropius atherinoides	37.5± 75.0	97.5±65.5	85.0±57.5	105.0±10.0	90.0± 60.0
Amblypharyngodon mola	105.0± 121.5	100.0±115.5	195.0±10.0	200.00± 16.3	210.00± 11.6
Osteobrama cotio	25.0± 28.9	56.3±2.5	37.5± 25.0	50.0± 0.0	30.0±34.6

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