

Fish marketing system and species availability at Paikgacha fish market (*Kata*) in Khulna, Bangladesh

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Abstract

The study was performed at Paikgacha fish market (*Kata*) to explore the current structure of fish marketing system, socio-economic status of personnel involved in fish trading and the species availability during the study period. The study investigated two distinct marketing system named general fish (white fish) marketing system and shrimp marketing channel. In the both market chain from producers to retailers the goods goes onward through a number of channel members like *aratdar*, *foria*, *paiker*, wholesalers, *chalani*, *depot*, and retailer. It was observed that the *aratdar*/auctioneer get 3 to 5% commissions from each auction by arranging the auction and contractual activities and providing other facilities such as clean water supply, electricity, space, communication etc. A variety of personnel involved in *arat* likewise *muhuri*, *koyal* and labour etc having distinct salary level. The usual amount of the daily fish supply was 10-15 tones with a traded value between Tk 5 and 6 million and the volume varies relying on the variation in catches during peak or off-season. A total of 58 species of fresh water, brackish and marine water fish and shrimp/prawn species were identified during the observation period. The percentage of categorical supply during the total study period was about 30%, 30% and 40% respectively for brackish and marine fish, freshwater fish and shrimp/prawn and it varies seasonally. Virtually most of the white fish distributed all over the country including Khulna, Barisal, Bagerhat, Gopalganj, Sylhet, Chittagong and Feni and about 90% shrimp is supplied to the processing industry for export. Although Paikgacha fish market goes through a number of problems it is a unique place for fish and shrimp trading of south-west coastal region.

Keywords: fish marketing, *kata*, *aratdar*, *paiker*, *muhuri*, *chalani*, and *depot*

1. Introduction

Inland water resources of Bangladesh are considered to be one of the richest in the world both in area and potential for fisheries development. Being fortunate with these natural gifts the country abounds in a large varieties of fish species that is 260 of freshwater fish species, 24 inland water prawn species, 486 species of marine fish, 36 species of marine shrimp and 12 species of exotic fishes (DoF, 2015) [6]. Bangladesh produced 3.68 m MT fish in the fiscal year 2014-15 and ranked 4th as major inland water capture fish producing country and also ranked 6th among top 25 farmed fish producing country in the world (FAO, 2016) [8]. However this vast fish production is disposed and marketed countrywide as well as exported through a number of diverse marketing system. The fish marketing system also varied region to region on the basis of geographical status *viz.* capture or culture fishery, resource availability, landing situation and infrastructural facilities of fish market. Fish markets have become a major issue for aquaculture sector, where consumers demands, international competitiveness, health and quality product are important (Muir *et al.*, 1996).

In Bangladesh, domestic fish market and fish distribution usually maintained by the private channels. Four marketing levels has been marked *viz.* primary, secondary, higher secondary and city or terminal market in the process of distribution. (Ahamsul, 1999) [2]. the prices usually fluctuated seasonally due to variations in the supply and demand (Shang, 1981) [19]. About 97% of the inland fish production is marketed internally for domestic consumption while the remaining 3% is exported (Hasan, 2001) [9]. A large number

of people, many of whom living below the poverty line, find employment in the domestic fish marketing chain in the form of farmers, processors, traders, intermediaries, day laborers and transporters (Ahmed *et al.*, 1993; DFID, 1997; Islam, 1996; Kleih, 2001) [7, 11, 12].

The fish market in our country is virtually a cluster of disorganized activities and always remains in the control of influential persons of the surroundings area, depending on a wide range of social, economic and political factors (Rashid, 2006) [17]. In addition an effective marketing system is necessary to make fish available to consumers at the right time and in the right place. However, several studies have already been carried out to explore the marketing system and the socio-economic condition of the poor retailers (Ahmed, 1997; Rokeya *et al.*, 1997; Siddique, 2001; Alam *et al.*, 2010; Asaduzzaman *et al.*, 2010 and Washim *et al.*, 2015) [3, 18, 20, 4, 5, 21], but very limited information is documented on Paikgacha fish market system (*Kata*) and its species availability. Therefore, the present study was undertaken to assess the existing fish marketing systems including species availability, infrastructural facility and socio-economic condition of the fish traders.

2. Materials and Methods

Study Site

The study site was Paikgacha fish market of Paikgachha upazila (Figure 1) is an exclusive shrimp and fish farming zone comprising 212 villages with an area of 411.19 sq km, is bounded by Tala and Dumuria upazilas on the north, Koyra upazila on the south, Batiaghata and Dacope upazilas on the

east, Tala and Assasuni upazilas on the west. It is one of the oldest and well known fish market in Khulna district particularly for shrimp marketing. This market is very important for the disposal of a large quantity of fish and shrimp everyday produced in the *gher* farming system of this area.

Methodology

Data Collection

The data was gathered over five months from 5th March to 30th June, 2016. For gathering data, combination of several

survey techniques was adopted. For this study a combination of questionnaire interview, Participatory Rural Appraisal (PRA) tools such as Focus Group Discussion (FGD) and crosscheck interviews were conducted with key informants such as Upazilla Fisheries Officer, Paikgacha Fish Market's Associations. The draft questionnaire was tested with 20 fish *aratdars*, 20 depo owners and 20 other individuals engaged in different types of work in the market area. The questionnaire were changed, modified and rearranged according to the experience gathered in pre-testing of questionnaire.

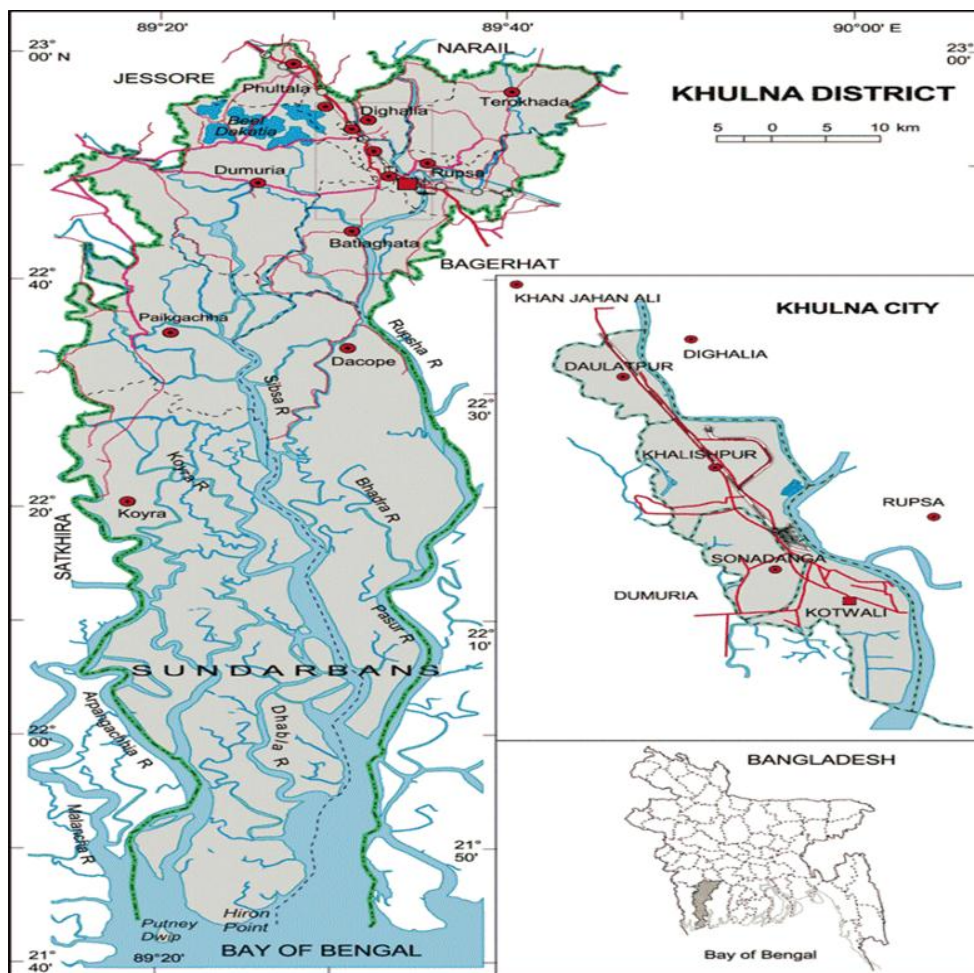


Fig 1: Location of study site

Data Processing and Analysis

The data and information collected were systematically reduced by accumulation, grouping and interpretation to represent as figures and tables so that the findings of the study could be presented in a meaningful way. Data from different relevant sources were coded and recorded into a database system by using simple statistical tools like average and percentage by Microsoft Excel software.

3. Results

Overview of Fish Market Structure

The Paikgacha fish market where the study was undertaken is reputedly as well as locally known as "*Kata*". So, Paikgacha fish market/*Kata* is traditionally a place where buyers and sellers are brought together to buy or sell fish and shrimp. Everyday 1500-2000 people gathered here and participate in

fish trading related activities because their subsistence is related with it. However, the fish market is governed by two self-comprised associations named *Paikgacha Matshya Aratdar Somobay Somiti* and *Paikgacha Chingri Biponon Kendra*. The main structural body of this market is *Arat*, Depot and Ice breaking and selling shop. In Paikgacha, total no of *Arat* is 45 each consisting of 5-6 individuals to work out. The owner of the *Arat* is called *Aratdar* as well as wholesaler. Most of the *arat* is under single ownership and 30-35% is under multi ownership. On the other side, there are about 51 shrimp Depots who only deals with shrimp marketing and 10 ice breaking and selling shop. The usual amount of the daily turnover of fish in this market is between Tk 5 and 6 million and the volume varies relying on the variation in catches during peak or off-season. In Paikgacha fish market, individual group of fish and shrimp either species

or size are sold in kg basis. However, there is no specified landing space in this market. The coming fishes and shrimp are directly kept in perforated plastic box named carrate, washed by splashing of water and then readied for open auction sale. About 85% *arat* is well spaced brick built and facilitated with adequate water supply. There is no supply water from pourashava, so they use self-funded shallow tube-well for washing purpose.

Season and Time of Fish Marketing

In Paikgacha fish *kata* the season of fish trading is round the year although the peak season of shrimp trading is between February and September. The marketing activities usually start from 7:00 am in the morning and the market is closed upon at 2-3 pm. However, the peak time of fish trading is between 8 am to 12 pm.

Personnel involved in arat, their key role and income

Usually 5 types of personnel involved in each *arat* and their wage are paid as daily basis. The most influential person is the owner of *arat* who usually works as the writer of marketing information (*Muhuri*) if literate enough or act as caller for open auction (*Koyal*). When the *aratdar* recruit a man as *muhuri* he gets 300-350 TK daily for his work. The *Koyal* for open auction he gets 250-300 TK, money (Taka) collector who get same as *Koyal*. The person involved for weigh up the traded fish get 200-220 TK and a labourer recruited for carrying the fish basket get TK 150-220 daily. Excluding *arat* there is also different work oriented day labourer and van driver involved for carrying fish from one place to another whose daily income is between 150-200 TK.

Social and economic status of aratdar

Aratdar demonstrate the auction system for both fish and shrimp as he belongs valid trade License. It is also a commission agent who has a fixed establishment and helps the farmers and *foria* to sell their products and usually charges a fixed commission of Tk 3-5% on the market price. Financially *aratdar* have more purchasing power than *foria* so he cannot compete with *arardar*. *Aratdar* also acts as a supplier of *dadan* to make his *aratdary* easier. The *aratdar* earn TK 3000-6000 daily on average both in peak and off-peak season. From this income he has to pay the described personnel involved in different activities of *arat*. The level of education and source of investment in business are depicted in Figure 1 and 2.

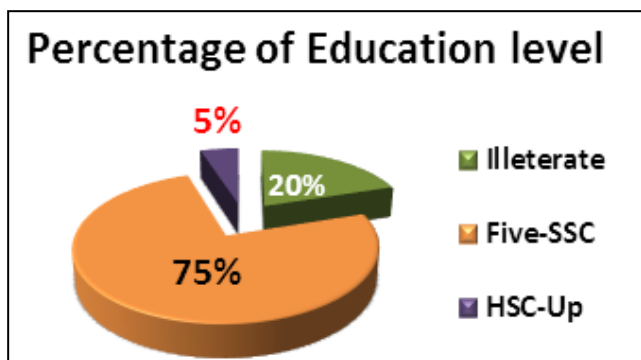


Fig 1: Level of literacy among *aratdar*

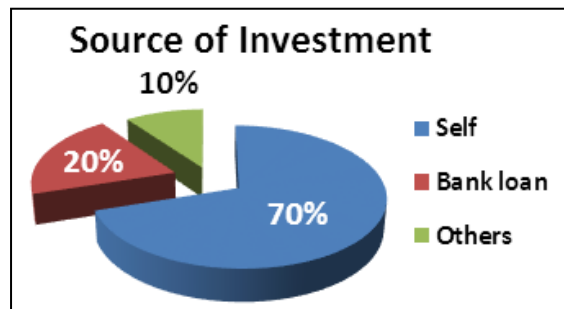


Fig 2: Status of investment source

The age distribution of the *aratdar* is ranged between 30 and 50 year. The study explore that, about 80% *aratdar* are involved in shrimp farming as secondary occupation and the rest are involved in different category of business like electronic shop, rice shop and groceries etc.

Status of Shrimp Depot

The depot is an integral part of Paikgacha fish market. The depots are mainly responsible for shrimp marketing following the HACCP manual precised by FIQC of DoF. They usually supply the raw shrimp directly to the shrimp processing industry securing a commission of 2-3%. But in the present situation they are highly dependable on the open auction *arat*, because the farmers specially the *foria* directly goes to the *arat* for getting the chance of doing adulteration in *arat* rather than depots. For this reason, a depot recruits 2-3 individual for collect raw shrimp from *arat*, who are called *paiker* or floating *foria*. Their daily wages are 250-300 Tk according to their buying capacity.

Fish supply in Kata

Fish and shrimp from many temporary and smaller fish market mainly Banka bazar, Kopilmuni, Village Paikhacha, Sholadana, Goroikhali, Chandkhali and also directly from shrimp *ghers* spread throughout Paikgacha upazila are flows to fish *kata*. Fish trading activities of these places are mainly under the strong control of *foria*. During the observation period, it was found that fishes were collected by *foria* and *bepari* which are called local agents and then they send these fish to the suppliers and to the *arat*. In most cases the fishes are carried by motor vehicle called "Nosimon" and *van* without any ice as a result the quality of fishes is slightly degraded. Beside this, farmers sometimes brought their raw goods directly to the *kata*. On average the daily supply of fish in *Kata* is about 10-15 tones in peak season.

Fish distribution

Fishes from Paikgacha fish market are distributed throughout the country particularly to the divisional city like Dhaka, Barisal Khulna, Bagerhat, Gopalganj, Sylhet, Chittagong, Chandpur and Feni. But the shrimps are distributed mostly to the processing industry for export market. Only 1-2% white fishes are supplied to the Paikgacha local consumer market and around 10% shrimp of different categories is distributed in different fish markets of the country. The fish and shrimp are distributed in distant areas with Truck or pick-up van in steel made or polystyrene insulated boxes with adequate ice.

Role of Middleman (foria)

Foria is the most critical part in Paikgachha fish market who makes the marketing channel more complex. *Foria* is a kind of middleman that waits in the local smaller market or somewhere on the street in the local village close to the ponds for the shrimp or collects it directly from the farm. But in case of white fish the *foria* buy the fish from local market and sell it in *kata*. Most often *foria* try to buy a mixed size of shrimp from smaller farms but some larger farms practice sorting and inspection on the floor before the farmer and *foria* bargain about the price because they know about grading and price. Thus, *foria* achieve profit by purchasing shrimp from farmers without grading, by underestimating the weight of shrimp or by only measuring the “dry weight” of shrimp. When reselling the shrimp to depots, *foria* apply deceptive methods to increase the resale price of shrimp. These methods include grading and pricing of shrimp according to official systems and submerging shrimp overnight in water for hours to increase their weight. To achieve higher grade the *forias* practice an adulteration method called ‘push’ which involves injecting barley, injecting water as well soaking for increasing weight.

Profile of Paiker/Chalani

There are a numbers of *paiker* in Paikgacha fish market who are mostly seasonal floating traders collecting fish and shrimp from different *arats* across the region. Depots are the primary buyers from the *paikers* who buy shrimp from *arat*. The *chlani* usually buy fishes at a rate discerned by the direct interplay of demand for and supply of fish in retail markets. Most of the cases he gets profit from his *chalan*, but sometimes he faces loss when market price reduced due to oversupply of the same species. The *chalani* stored and packed up the white fishes performing grading throughout the trading period. All the fishes are usually transported within 4-5 pm.

Marketing systems

There are two distinct types of marketing systems exist in Paikgacha fish market, one is fish marketing system and the other is shrimp marketing system. The fish (white fish) marketing system (Figure 3) is not more complex like shrimp marketing (Figure 4) system of this market. Shrimp is distributed for both domestic and mainly for export market.

About 90% of shrimps are supplied to processing industry and the rest are distributed in countrywide local market.

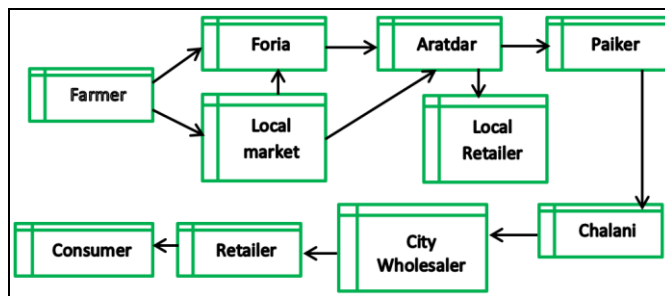
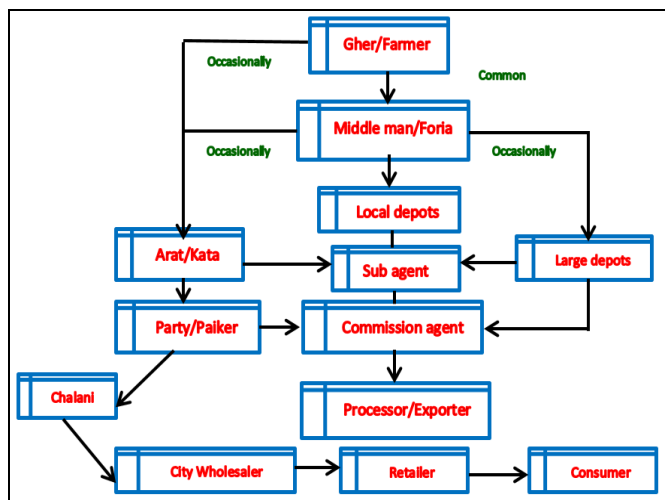


Fig 3: General fish (white) marketing system of Paikgacha fish market (*Kata*)



Source: Own field survey conducted by the present author, 2013.

Fig 4: Shrimp marketing channel of Paikgacha fish market (*Kata*)

Composition of fish and shrimp species in Paikacha fish market

A total of 58 species of fresh water, brackish and marine water fish and shrimp species were identified during the observation period in this fish market. Among the available species there were 24 brackish and marine water fish species, 25 fresh water fish species and 9 shrimp and prawn species. The major fish and shrimp species are available in Paikgacha fish market has been tabulated in Table 1.

Table 1: Fish and shrimp species identified in Paikgacha fish market

Brackish and marine water fish species			
S. No.	Local Name	English Name	Scientific Name
1	Bhetki	Barramundi/Seabass	<i>Lates calcarifer</i>
2	Nona Tengra	Long whiskar catfish	<i>Mystus gulio</i>
3	Parse	Green back Mullet	<i>Chelon subviridis</i>
4	Nona Bele	Bumblebee goby	<i>Brachygobius nunus</i>
5	Kine Magur	Canine eeltail catfish	<i>Plotosus lineatus</i>
6	Shada Datina	Silver bream	<i>Pomadasys hasta</i>
7	Chitra/Bistara	Spotted butter fish	<i>Scatophagus argus</i>
8	Khorkuno	Corsula mullet	<i>Rhinomugil corsula</i>
9	Tapossi	Paradise threadfin	<i>Polynemus paradiseus</i>
10	Poa	Pama	<i>Otolithoides pama</i>
11	Phasa	Anchovies	<i>Thryssa mystax</i>
12	Somudra/Kath koi	Atlantic Tripletail	<i>Labotes surinamensis</i>
13	Rita	Rita	<i>Rita rita</i>
14	Amadi	Pointed tail anchovy	<i>Coilia dussumieri</i>

15	Lal poa/Vola	Silver jew	<i>Johnius argentius</i>
16	Chewoa	Torpedo trevally	<i>Taenoides anguillaris</i>
17	Bhangan	Mullet	<i>Mugil cephalus</i>
18	Kukurjiv	Sole	<i>Cynoglossus macrostomus</i>
19	Ilish	Hilsa shad	<i>Tenualosa ilisha</i>
20	Somudra chela	-	<i>Thryssa purava</i>
21	Shaplapata/Haush	Sting ray	<i>Himantura uarnak</i>
22	Rekha	Four barred finger fish	<i>Corius quadrifasciatus</i>
23	Tulardandi	Lady fish	<i>Sillaginopsisspanijus</i>
24	Tarial/Tailla	Four finger threadfin	<i>Eleutheronema tetradactylum</i>
Freshwater fish species			
1	Rui	Indian major carp	<i>Labeo rohita</i>
2	Catol	Catla	<i>Catla catla</i>
3	Mrigal	Mrigal carp	<i>Cirrhinus cirrhosus</i>
4	Kalibaus	Black rohu	<i>Labeo calbasu</i>
5	Tilapia	Nile tilapia	<i>Oreochromis mossambica</i>
6	Grass carp	Grass carp	<i>Ctenopharyngodon idella</i>
7	Common carp	Common carp	<i>Cyprinus carpio</i>
8	Mirror carp	Mirror carp	<i>Cyprinus carpio var. specularis</i>
9	Silver carp	-	<i>Hypophthalmichthys molitrix</i>
10	Thai pangus	Pangus	<i>Pangasiodon hypophthalmus</i>
11	Thai sarputi/Rajputi	Olive barb	<i>Banbonymus gonionotus</i>
12	Koi	Climbing perch	<i>Anabas testudineus</i>
13	Shing	Stanging cat fish	<i>Heteropneustes fossilis</i>
14	Magur	Air breathing catfish	<i>Clarius batrachus</i>
15	Taki	Spotted snakehead	<i>Channa punctata</i>
16	Shol	Banded snakehead	<i>Channa striata</i>
17	Gozar	Giant snakehead	<i>Channa marulius</i>
18	Cheng	Asiatic snakehead	<i>Channa orientalis</i>
19	Chital	Humped featherback	<i>Chitala chitala</i>
20	Foli	Grey featherback	<i>Notopterus notopterus</i>
21	Baim/Guchi	Striped spiny eel	<i>Macrognathus pancalus</i>
22	Mola	Indian carplet	<i>Amblypharyngodon mola</i>
23	Nilotica	-	<i>Oreochromis niloticus</i>
24	Kankila	Needle fish	<i>Xenentodon cancila</i>
25	Ek thoitta	Halfback	<i>Hyporamphus limbatus</i>
Shrimp and prawn species			
S. No.	Local Name	English Name	Scientific Name
1	Bagda chingri	Black tiger shrimp	<i>Penaeus monodon</i>
2	Golda chingri	Giant freshwater prawn	<i>Macrobrachium rosenbergii</i>
3	Harina chingri	Brown shrimp	<i>Metapenaeus monoceros</i>
4	Chaka chingri	Indian white shrimp	<i>Penaeus indicus</i>
5	Chali chingri	Yellow shrimp	<i>Metapenaeus brevicornis</i>
6	Gura chingri	Spider prawn	<i>Macrobrachium tenuipes</i>
7	Bagatara chingri	Green tiger shrimp	<i>Penaeus semisulcatus</i>
8	Doda chingri	Goda river prawn	<i>Macrobrachium scabriculum</i>
9	Chamua chingri	Brown shrimp	<i>Metapenaeus spinulatus</i>

The present study investigated that for marine and brackishwater fish and shrimp the peak season of abundance is ranged between February-August as it is one of the promising shrimp culture region of South-west coastal belt. During the study period there were about 30% marine and

brackishwater fish and 40% shrimp in the market. The recorded percentage of abundance for fresh water fish was about 30% although the supply of fresh water fish is continued throughout the year.

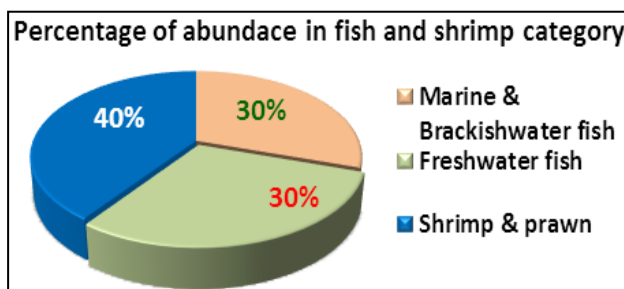


Fig 5: Categorical percentages (%) of fish and shrimp abundance during the observation period

Bottlenecks and constraints of Fish Market

In consideration of the infrastructural constrains, lack of modern and hygienic fish landing centers; inadequate drainage facilities; lack of awareness about handling, sanitation, icing and storage; inadequate ice-plants with sufficient capacity, cold and freezer storage; lack of handling and preservation facilities etc. were the most severe phenomenon. Problems are particularly serious in certain remote area where the producer faced poor transportation and distribution facilities having roads below the mark. The shrimp *depot* owners are now facing serious shortage of raw shrimp as they can not compete with white fish market as well as *arats*. One of the notable constraints of this fish market is involvement of middleman (*foria*) who interferes in every steps of marketing. The consumers have to pay higher price due to the participation of too many intermediaries in the marketing channel, but the actual fishers or farmers do not get the actual price for their products and the lion shares go to the intermediary's pocket.

4. Discussion

Since fish production in Bangladesh is still increasing, its disposal pattern is very important as growers, wholesalers, retailers and consumers- all are affected due to exploitation through value addition in the marketing process by a number of intermediaries. The fish market infrastructure as well as marketing profile is frequently different from place to place. Two marketing system *viz.* general fish marketing and shrimp marketing system was discovered, however Asaduzzaman *et al.*, 2010^[5] stated three fish marketing chain in Rajshahi city. For marketing of fish or fishery products domestically and for the physical development of markets, infrastructure facilities are most important (Hossain and Ali, 2014)^[10]. Fish marketing system in Paikgacha fish market goes onward through a number of channel members like *Aratdar*, *foria*, *agent*, *chalani*, *depot*, *wholesaler* which is consistent to the observation of Ahmed, 1984,^[1] Hossain and Ali, 2014^[10] and Washim *et al.*, 2015^[21]. Alam *et al.*, 2010^[4] described that about 40% fish traders in Swarighat were illiterate whereas 20% *aratdar* of Paikgacha fish kata are found illiterate. Rahman, 2003^[16] found that the daily supply of fish at Gazipur Sadar and Sripur fish market was 2-3 and 1-2 tones, respectively which was found much more (15-20 tones) in this market. Nelufa *et al.*, 2013 reported that, there were 57 species on average in different fish market of Noakhali district. However, the abundance of fresh water, brackish and marine water and shrimp/prawn was 30%, 30% and 40% respectively comprising 58 species but contrarily it was 55.86% for freshwater cultured fish, 28.01% for marine and brackishwater fish and 16.01% for fresh water capture fish comprising 115 species in Daulatpur fish market, Khulna (Hossain and Ali, 2014)^[10]. A common indicator of marketing efficiency is the size of the marketing margin which is the differences between the farm gate price and the next price level such as retailer. Marketing costs are high if marketing functions are not performed efficiently due to functional difficulties such as poor roads, inadequate storage leading to losses, poor handling, etc. Profits may be high if there are high risks of losses and huge capital investment (Rahman *et al.*, 2009)^[15].

Since, the Paikgacha fish marketing system encompassed with a lot of problems like lack of modern and hygienic

landing centre; storage of adequate ice-plants with sufficient capacity, cold and freezer storage; inadequate drainage facilities; lack of handling and preservation facilities; illiteracy, ignorance, lack of awareness and poor socio-economic condition of the fishers etc were the most severe. Yet little or no initiative was taken to improve the quality of fish market because the demand of fish was always higher than the supply. As a result, fish of any quality were sold in the market although the traders were faced serious problems including heavy losses, wastage and poor price. Considering the above mentioned drawbacks in the fish market we suggest the following recommendation to improve the marketing system:

- Establishment of a simplified marketing channel specially for shrimp avoiding the interfere of *foria*,
- Establishment of adequate cold-storage and preservation facilities for shrimp *depots*
- Introduction of insulated and refrigerated fish vans and fish carriers during transportation to retain the quality of fish and shrimp,
- Improvement of communication fish transport, handling facilities,
- Establishment of modern wholesaling facilities including sufficient auction places,
- Establishment of a well-planned drainage system and washing facilities for each *arat*,
- Launching of mechanical weighing equipment,
- Training of different personnel on handling, washing, sanitation and hygiene, packaging of raw fish and about shelf life of fish as well as quality loss,
- An independent act or policy for fish landing and marketing.

5. Conclusion

Despite having many problems this market is still regarded as an important and one of the biggest fish market in Khulna district and government get huge amount of revenue as taxes from this market system. So, a prompt and empirical intervention by the government and public-private relationship is necessary for commercial implementation and improvement of the existing fish marketing system of Paikgacha fish *kata*.

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