



**MARKETING CHANNEL AND VALUE CHAIN  
ANALYSIS OF BOMBAY DUCK (*Harpadon  
nehereus*) AND SEA BASS (*Lates calcarifer*) IN  
CHATTOGRAM AREA OF BANGLADESH**

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Roll No.: 0119/09

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**The thesis submitted in the partial fulfillment of the requirements for the degree  
of Masters of Science in Marine Bioresource Science**

**Department of Marine Bioresource Science  
Faculty of Fisheries**

**Chattogram Veterinary and Animal Sciences University  
Khulshi, Chattogram- 4225**

**April 2021**

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**This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made**



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## Abbreviations and Symbols

<b>Abbreviations</b>	<b>Full</b>
GDP	Gross Domestic Product
et al.	Et alia (and others)
NM	Nautical Mile
EEZ	Exclusive Economic Zone
BDT	Bangladeshi Taka
CMA	Chattogram Municipal Area
PRA	Participatory Rural Appraisal
RMA	Rapid Market Appraisal
SSI	Semi-structured Interview
Kg	Kilogram
°C	Degree Celcius
÷	Division
x	Multiplication

## Abstract

Fishes are a highly perishable food commodity that requires rapid and smooth supply to the consumers. For the commercially important fishes, it is necessary to make the fishes to be supplied, ensuring good quality, to the consumers at the right time and right place. To achieve these conditions, a well-structured marketing system is required for each fish species. The present study was conducted to investigate the marketing channel and value chain of two commercially important marine fish species in the Chattogram area, Bangladesh. The studied species were Bombay duck, *Harpodon nehereus* and Sea bass, *Lates calcarifer*. A total of three types of markets were investigated in the present study which were primary, secondary, and retail markets. For this investigation, a total number of 120 people, fishermen and intermediaries, were interviewed. In the case of Bombay duck, 4 intermediaries were found to be involved in the marketing chain whereas, for Sea bass, 5 intermediaries were found. It is believed that this intermediary group makes a huge profit which makes the prices of fishes to become very high in the final consumer market. The marketing margin for Bombay duck and Sea bass were 38% and 35%, respectively. Fishermen share in consumer purchase price were 86%, 73% and 62% in case of Bombay duck, and 87%, 75% and 65% in the case of Sea bass in primary, secondary and retail market, respectively. Poor transport facilities and a huge number of intermediaries in the marketing channels were the main problems of the marine fish marketing channel. Government intervention in the marketing channel of those marine species is necessary for sustainable and economic fish marketing systems.

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**Keywords:** Marketing channel, Bombay duck, Sea bass, Marketing margin

## Chapter I: Introduction

One of the six main groups of animals along with invertebrates, amphibians, reptiles, birds, and mammals, fish are so plentiful in the world's oceans, lakes, rivers, and many other water bodies which is an inimitable source of animal protein. Globally, fish provides about 3.0 billion people with almost 20 % of their average per capita intake of animal protein, and 4.3 billion people with about 15 % of such protein (DoF, 2019). Bangladesh is gratified with rich extensive inland and marine fisheries potential resources with a wide variety of indigenous and exotic fish fauna. There are 475 species of marine fishes and 260 species of freshwater fishes (DoF, 2013). The economy of Bangladesh is agro-based which contributes 58% of animal protein to the daily diets of the population, 25.71% to agriculture, 1.50% in export earnings, and 3.50% to GDP (DoF, 2019). The supply of fish for daily protein intake is 62.58g, whereas the demand is 60g (BFTI, 2016). Bangladesh is also one of the developing countries that experience the proliferation of aquaculture which is the world's fastest-growing food production sector. (Belton and Thilsted, 2014). Moreover, Bangladesh has sovereign right on 118,813 square kilometers area of territorial sea in the Bay of Bengal upto 200 nautical miles (NM) of Exclusive Economic Zone (EEZ). The coastal and marine environment of Bangladesh is blessed with a warm tropical climate and high rainfall, enriched with nutrients from land, creating one of the world's richest ecosystems with high productivity (Hossain, 2001). So it is rich with the coastal and marine ecosystem that hosts a wide range of biodiversity including fishes, shrimps, mollusks, crabs, mammals, seaweed etc. Some of those species are commercially so important that they are captured by both artisanal and commercial fishing.

Bombay duck and Sea bass are captured by using both artisanal and commercial fishing because of their commercial importance. Due to their delicacy and great food value, the people of Bangladesh love to eat them. Moreover, dried Bombay duck and Sea bass add food value to the appetite of people as well. These are the reasons which make these two fish commercially important so as their marketing channel. The marketing channel is a system that ensures the distribution of merchandise from the producer to the consumers by passing it through multiple levels known as middlemen (Geyskens et al., 1999). It is also known as channels of distribution. Intermediaries are the people or organizations which act as a link between the manufacturers and the customers. They

have multiple functions to perform which facilitate both, the companies as well as the customers (Achrol et al., 1983).

The primary purpose of any channel of distribution is to bridge the gap between the producer of a product and the user of it, whether the parties are located in the same community or in different countries thousands of miles apart (Hibbard et al., 2001). In other words, the channel of distribution can be defined as the most efficient and effective manner by which a product is delivered to the hands of the customer. It also ensures the mobility of goods or services from the manufacturing units to the area of its consumption. If the proper merchandise is not distributed properly, the manufacturer won't realize the desired value of his production (Gaski and Nevin, 1985). The potential of each channel system is to create sales and producing costs. The chosen channel will significantly affect and be affected by the rest of the marketing mix. A channel has both vertical and horizontal dimension where the channel's vertical dimension (length) can be determined by the number of types of participants exist in the channel (Hibbard et al., 2001). If there are no intermediaries involved then it is called the most direct channel (a zero-level channel). A direct or zero level channel enables the producer to have greater control over the distribution of their products. Intermediaries stand between the producers and final buyers in indirect channels. On the other hand, the number of participants involved in the same level of a channel determines a channel's horizontal dimension (width). The situation varies from one line of goods to another considerably.

Many manufacturers recommended using more than one kind of channel for the same market which is sometimes necessary. The channel is composed of different institutions as well. Which facilitates the transaction and the physical exchange (Coughlan, 1985). Institutions in channels fall into three categories including producer, the user of the product, and middlemen. Producers include farmers, manufacturers, craftsmen, or other extractive industry producers involved in the fishery. The user of the product constitutes with household, individual, institution, or government business buyer. Middlemen are the intermediaries involved at the wholesale and/or retail level (Gaski and Nevin, 1985). A channel performs three important functions. Not all channel members perform the same function. The functions are transactional: buying, selling, and risk assumption; logistical functions: assembly, storage, sorting, and transportation and facilitating functions: maintenance, financing, information dissemination, post-purchase service, and channel coordination or leadership. The effective flow of product depends on these

functions which title to the customer and payment back to the producer as well (Geyskens et al., 1999).

The fisheries sector of Bangladesh is having great importance by providing food, generating employment, and brushing up the economic status of people. More than 17 million people including about 1.4 million women depend on fisheries sectors like fishing, farming, fish handling, and processing, for their livelihoods (BFTI, 2016). It's because of having enormous water bodies both in open and closed water. It includes 700 small and big rivers, which makes her a riverine country and 1,18,813 square kilometers of territorial sea in the Bay of Bengal (DoF, 2019). Fisheries development mainly depends on improved production, advanced processing technology, and also on effective marketing systems. Fish marketing is not only limited to the selling of fish but also includes all the activities which exert considerable impacts on the exploitation, production, distribution reducing middlemen (Agarwal, 1990). In Bangladesh, about 97 percent of the fish production is marketed internally for domestic consumption, while the remaining part is exported (Rahman, 1997). As compared to the export market, the domestic market is huge with a great variety and complex marketing system. In terms of volume, the domestic market is bigger than the export market. The marketing channel provides the channel of communication between the producers and consumers which passes through a number of intermediaries also known as middlemen: farias, beparies, retailers, and aratdars. The middlemen in the fisheries sector extremely exploiting the fish farming communities by establishing a new marketing chain and setting up artificial pricing through intermediaries at different levels (Thompson, 1993). It results in a huge gap in pricing between producers and consumers. Therefore, it is important to know the existing fish marketing system to improve the overall fish marketing system. Presently the marketing system of our country is important because it is often considered to be a limiting factor for fisheries development (Rahman, 1997).

Chattogram is a southeastern district of Bangladesh and one of the largest megacities in the country. To quench the demand for the aquatic protein of the growing population of this city, a smooth supply of a huge number of marine and freshwater fish is needed every day. This city has a long coast with the Bay of Bengal, which is a good source of saltwater fish supply, which has made the city a hub of marine water fishes. To supply the demand of the population, a good number of fish markets are established at various points around the Chattogram district. Different species of marine fishes are available

on those markets; among them, Bombay duck and Sea bass are two of the more commercially important species. Various studies have been conducted in the different coastal regions of Bangladesh on various aspects of the fish marketing system of different species. However, few studies have been conducted on the marketing channel of Bombay duck and Sea bass species in the Chattogram region.

Therefore, the main objectives of the present study were to;

- Analyze the existing marketing system of Bombay duck and Sea bass in the Chattogram region.
- Calculate the marketing margin of those channels.

## Chapter II: Review of Literature

A literature review provides a base of knowledge on a specific topic using a systematic and comprehensive analysis of scholarly articles, books, and other sources. It helps to build a foundation of knowledge in that specific field identifying the interests, relationships, gaps, conflicts in previous studies. It is the best way to place one's research within the context of existing literature making a case for why further study is needed.

### 2.1 Bombay duck

Despite the name, Bombay duck (*Harpadon nehereus*, Hamilton 1822) is not a duck but a Lizardfish. It is also known by many other different names such as Bummalo, Bamaloh, Loytta, Bombil, etc. The species geographically occurs along the coast of middle-east, south Asia, south-east Asia until the east coast of China and the North-East of Australia (Fisher and Bianchi, 1984). It has an elongated and compressed body with small eyes and a very short snout. It also has a very wide mouth with a comparatively longer lower jaw than the upper jaw. The mouth is armed with slender recurved and depressible teeth. Their teeth are unequal in size. The palatine teeth are also large and depressible. They have a dorsal fin followed by a conspicuous adipose fin. They have a lateral line with 40-44 scales, extending onto the pointed median lobe of the caudal fin (Johnson et al., 2006). It is generally of uniform light grey color, with a semi-transparent appearance. Their average body length is around 25 cm, with a maximum of about 40 cm (Whitehead, 1984). The dorsal fin has 11-12 rays, the anal fin has 14-15 rays, and the pectoral fins are with 10-12 rays. The pectoral fin rays are longer than the head length. Their pelvic fins are very long with 9 rays. The fish inhabit deepwater offshore on sandy mud bottom for most of the year but also gathers in large shoals in deltas of rivers to feed during monsoons (Frimodt, 1995). The breeding biology of the fish is marvelous. It can spawn 6 batches of broods per year (Fernandez and Devaraj, 1996). Bombay duck has a great food value. Though the fish carcass contains around 83% water but the remaining parts are filled with nutrients. 100g dry muscle of Bombay duck contains 85.2g protein, 9.02g ash, 3.75g Ca, 1.50g K, and 0.18g Na (Nazir and Magar, 1965). It is a highly commercial fish in Bangladesh that is



marketed as both raw and dried. The annual production of Bombay duck in Bangladesh is 1.7 million tons which is around 12% of the total marine catch (Barange et al., 2018)

## 2.2 Sea bass

Sea bass (*Lates calcarifer* Bloch, 1790) is a perch like fish under the class perciformes. It is known as Koral, Bhetki, Barramundi, Koi Koral, etc different parts of the world. It is a euryhaline fish that can live in freshwater, brackish water and in marine water as well. It is a catadromous fish that means it migrate to brackish water for spawning (Riede, 2004). The depth ranges from 10-40 m in a water body (Whitehead, 1984). Sea bass can be found in Indo-West Pacific: eastern edge of the Persian Gulf to China, Taiwan and southern Japan, southward to southern Papua New Guinea and northern Australia (FAO-FIGIS, 2005). In the tropical region that ranges 15-28°C is the main habitat of Seabass (Baensch and Riehl, 1985). The maximum body length reported was 200cm (Kottelat et al, 1993) whereas the common length reported 150cm (Larson, 1999). The maximum published weight was 60 Kg (Larson and Martin, 1989). Sea bass has an elongated body with a rounded caudal fin. It has a large mouth that is slightly oblique and the upper jaw extending behind the eye. The lower edge of the dorsal fin serrated, with strong spines at its angle. Opercle with a small spine and with a serrated flap above the origin of the lateral line. It has a total of 7-9 dorsal spines, 10-11 dorsal soft rays, 3 anal spines with 7-8 soft rays (Larson, 1999). Sea bass is a protandrous hermaphrodite fish that means it changes sex in its life span (Moore, 1979). In larval and young juvenile stages they live in brackish water especially temporary swamps associated with estuaries and older juveniles gradually inhabit the upper reaches of rivers (Kailola et al., 1993). It is reported that they have a preference to take cover on undercut banks, submerged logs and overhanging vegetation (Allen et al., 2002). It's a carnivorous fish that eat fishes and crustaceans in the adult stage and the juveniles eat insects (Allen et al., 2002). Sea bass breed in estuaries throughout the Indo-Pacific region. Maturing male sea bass migrate downstream from freshwater habitats at the start of the wet (monsoon) season to spawn with resident females in estuaries (Buschmann et al., 1996). The spawning occurs on the full moon and new moon, primarily at the beginning of an incoming tide that carries the eggs into the estuary (MacKinnon et al., 1986). Female sea bass is capable of producing large numbers of

eggs, with estimates as high as 2.3 million eggs per kg of body weight (Davis, 1984). It is a very popular fish of very considerable economic importance (Larson, 1999). Fishes are sold fresh and frozen, consumed steamed, sin dried pan-fried, broiled and baked (Frimodt, 1995). Though the fish is captured from the wild, but presently cultured in aquaculture system in Thailand, Indonesia and Australia (Larson, 1999).

### **2.3 Fish Marketing Channels in Bangladesh**

The marketing channel is a system that ensures the distribution of merchandise from the producer to the consumers by passing it through multiple levels known as middlemen (Geyskens et al., 1999). It is the most efficient and effective manner by which a product is delivered to the hands of the customer. Bangladesh has obtained fifth position in the whole world with 42.77 lac metric ton of fish production (DoF, 2019). So it is necessary to study the fish marketing channel of Bangladesh for ensuring organized market chains in the fish marketing system. Economic status of aratdars and fish marketing system in Natore and Rajshahi were analyzed in 2012 where the price of *Chanda ranga* varied  $20.38 \pm 4.58$  Tk/kg and in case of *Clarias batrachus*  $190.17 \pm 27.33$  Tk/kg in four types of marketing channels in Baneshwar. The average marketing cost and marketing margin varied from 91 to 128 Tk/day and 17.75 to 28.25 Tk/kg and it was also recommended to introduce modern wholesaling and retailing facilities along with season based modern storage system (Flowra et al., 2012).

The structural performance of the fish market in Bogura district was analyzed where the daily supply of fish in Fateh Ali Fish market, Godarpara Fish market and Khandar Fish market were 6.75 tons, 0.765 tons and 0.495 tons, respectively. The present supply and requirement of the fish of those markets showed a wide gap and virtually most of the fish (85%) is imported from outside where the local supply of fish is only 15%. From which fish farmers at present day get a desirable percentage of the retail price which is 72-87% (Uddin et al., 2018). A similar type of situation can be found in the analysis of the marketing system and the socio-economic status of Puthia upazila of Rajshahi district. The daily supply of fish in Jhalmalia bazaar was estimated at 1.6 m. tones while 0.3 m. tones and 0.45 m. tones in Baneshawar and Puthia bazaar, respectively. The average net profit that retailers can make was higher in Jhalmalia

BDT 333 followed by Baneshwar bazaar BDT 54 and Puthia bazaar (BDT 106/day/retailers). They have also found a percentage of 86.66% retailers who have improved their socio-economic condition through fish trading whereas 13.33% couldn't obtain that due to large family size, poor education and lack of capital for this business (Aktar et al., 2010)

The fish marketing systems of Gaibandha district shows that fish price was assorted from BDT 64.20±3.82 (*Chanda ranga*) to 798.80±10.09 Tk per kg (*Ompok pabda*). Four categories of fishes: Exotic, Indigenous, Live and SIS (Small Indigenous Species) can be found in those markets. The aratdars use agriculture as a secondary source of income. The majority (46.23% in Fulchari to 70.73% in Gaibandha Sadar) aratdars were found to earn BDT 500-1000/day, while, only 16.71% aratdars earn BDT 100-500/day in Gaibandha sadar and 22% aratdars in Gobindagonj earn above BDT 1000/day (Barman et al., 2014). The fish marketing system of the northwestern region of Bangladesh, especially Dinajpur shows that the average marketing cost of the retailer was BDT 3.69/kg and the net marketing margin of the retailers for Indian major carps and Exotic carps were BDT 8.42 and 19.17/kg, respectively (Flowra et al., 2013). The income of aratders in Dinajpur district ranges from 350-600 BDT/day whereas the retailers' income ranges from BDT 300 to 450/day (Ara et al., 2019).

The marine fish and freshwater fish supply amount were reported in Swarighat, Dhaka near about 20% and 80% respectively where it was also estimated that near about 15% of supplied fishes were Indian major carps, 10% exotic carps, 5% other carps, 25% hilsa, 10% catfish, 5% snake-heads, 3% live-fish, 5% small indigenous fish, 7% prawn and shrimp, 5% tilapia and 10% others including small shrimp and marine fishes (Alam et al., 2010). Mainly three important methods practiced to fix the price in the fish marketing system in Gazipur: open auction, bargain and whisper. Open auction takes place in the wholesale market among the intending bidders where the auctioneer usually charges 2-5% of the sale price from the wholesaler (Ahmed et al., 2005).

The marketing channels of marine fishes: Bombay duck and Ribbon fish in Cox's bazar region were analyzed where the total marketing margin for per kg fish was BDT 19 which was 29% of the consumer purchase price and constituted 9%, 6% and 14% in primary, secondary and consumer market, respectively in case of Bombay duck and BDT 65 which was 28% of the consumer purchase price and constituted 10%, 5% and

13% in primary, secondary and consumer market, respectively in case of Ribbon fish. Moreover, total marketing profit for per kg Bombay duck fish was BDT 13 which constituted of BDT 4, 2.5 and 6.5 where fishermen share to sales price were 88%, 82% and 71% in primary, secondary and consumer market, respectively (Ahsan et al., 2016). The average marketing margin price per quintal of fish for fishermen was BDT 305.56 and for aratrder, paiker and retailer were BDT 334.65, BDT 515.8 and BDT 340.4 respectively were calculated in beel Dakatia in Khulna. The profit of paiker was the highest (9.94%). Two types of marketing channels were identified where fishermen receive 78.14% and 72.06% BDT, respectively (Ara et al., 2010). The marketing profit obtained by the marine dry fish exporters are BDT 115.52/kg by exporting five different species of fish and the marketing profit they make per kg was found to vary with species viz. BDT 44.49/kg for Bombay duck to BDT 242.94 for Pomfret (Haque et al., 2015)

## Chapter III: Materials and Methods

‘Materials and Methods’ is an indispensable and integral part of any research. In scientific research, the acceptability of the results depends on a great extent on the appropriate methodology. This chapter deals with the methods that are followed and materials that are used to achieve the objectives of the study. The results may be erroneous for the use of the imperfect methodology. In this study, a scientific and logical methodology has been followed by the researcher. This study is based on a survey in different fish markets, data collection and analysis for the interpretation of results.

### 3.1 Experimental design

The study was conducted in Pahartali and Khulshi thana of Chattogram Municipal Area (CMA) under the district of Chattogram. Three types of fish markets such as primary, secondary and consumer markets were selected for this study. Primary markets are the places where the harvested fishes are taken by the farmers or producers. The secondary market generally plays the role of gathering, sorting and wholesaling. Finally, the consumer market, which mainly consists of retailers, enables consumers to buy those products. Primary data were gathered by field survey for a period of about six months from July 2019 to December 2019. Combinations of participatory, qualitative and quantitative methods were used for data collection. The total sample size of the study was 120 which comprised mainly of 45 fishermen, beparis and depot owners, 25 brokers and marketing agents, and 50 retailers.

**Table 1: Name of different marketing channels of the visited area**

Level of marketing channel	Visited markets
Primary market	Fishery ghat, Kattoli beach
Secondary market	Fishery ghat cold storage, Wholesale market of old Fishery ghat
Consumer market	Foillatoli bazar, Pahartoli bazar, Jhautola bazar, Basket, Khulshi mart, Shawpno super shop

### 3.2 Study area

The primary markets were selected based on landing centers. There are two landing centers also known as Fishery ghat in Chattogram Municipal Area (CMA) which considered as main landing centre of marketing channel. One is old Fishery ghat and another is new Fishery ghat. The new one is commonly used for fish landing, sorting, assembling, and selling. The old one is used for auction for a large number of fishes. Besides these two main landing centers, fishermen also use the beach areas as a landing spot. Temporary and sometimes permanent markets are build up around it. The most common landing center in Pahartali area was identified in Kattoli beach. Though there is no good infrastructure for running a market still local fishermen gather there to sell their fishes just after the catch. The most important cause that influenced to use the place as a landing center is an ice factory situated near it. The secondary market is formed mainly with the depot owners and wholesalers. The wholesale markets are identified as situated near the primary market or the landing centers. The wholesalers generally have the facility of cold storage or manage to store fishes in cold storage. Finally, the consumer market was visited all around the area. These markets are mainly local markets set up based on a locality or residential area. Retailers bring fishes from the wholesalers or the depot owners to sell at retail prices. Besides those local markets, the super shops of that area were also visited to have a clear idea about the marketing margin. Super shops named Basket, Khulshi mart and Shawpno were visited as a retail market.



Figure 1: Map of Pahartali and Khulshi area

### **3.3 Questionnaire preparation**

A questionnaire was established based on information needed for identifying the intermediaries of the marketing channel. The questions were semi-structured, so the interviewee could choose an answer from the options or he could describe if needed. The main focus of the questions was about the marine fish distribution and marketing systems, buying and selling person, purchase price, sale price, marketing cost, marketing profit, and marketing constraints. (Attached at annex)

### **3.4 Field survey**

The required information and data were collected by field survey through personal visits to the selected markets. 30 fishermen, 8 beparies, 7 depot owners, 25 brokers and marketing agents and 50 retailers were directly interviewed with the preset questionnaire. For having precise information, the markets were visited 3 times during the 6 months research period with 2 months interval.

### **3.5 Observation**

During the survey, fish availability, number of sellers and customers, proper infrastructure, drainage and transportation system, availability of ice were inspected. The positioning of stores, bargaining of customers, value addition were taken into account. The shares of sales that the market authority gets were counted in percentage.

### **3.6 Participatory Rural Appraisal (PRA)**

PRA is a group of methods to collect information on a participatory basis from rural communities. The advantage of PRA over other methods is that it allows wider participation of the community, the information collected is likely to be more accurate (Chambers, 1992; Nabasa et al., 1995). Different PRA tools were applied during the field survey.

#### **3.6.1 Transect walk**

Transects walk is a PRA tool that is applied to study the natural resources, topography, indigenous technology, soils and vegetation, farming practices, problems and opportunities. All the market areas of the three categories were observed as transect

walk before interview and data collection to have an overall idea on the placement, opportunities and problems of the market. The landing sites, sorting and assembling area, storage area, ice factory, selling area were identified using transect walk.

### **3.6.2 Semi-Structured Interview**

A Semi-Structured Interview also known as SSI is a PRA tool that can be used any time. SSI is guided interviewing, where only some of the questions are predetermined and new questions come up during the interview. The interviewer prepares a list of topics and questions rather than a fixed questionnaire. SSI is used in this research with the questionnaire interview.

### **3.6.3 Focus group discussion**

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. This tool was used on the fishermen of the primary market about their social and economic status, fish marketing system and constraints they face during marketing.

### **3.6.4 Rapid Market Appraisal (RMA)**

RMA is an efficient way to obtain policy-relevant and intervention-focused information about any commodity sub-sector (Holtzman, 2003). RMA techniques mostly rely on semi-structured interviews with key informants, knowledgeable observers of a sub-sector, and a minimum number of participants at different stages of the commodity system. RMA was used to collect information from marketing agents and market authorities.

## **3.7 Data analysis**

All the collected data were used for calculating marketing margin, marketing profit and fishermen share in the consumer purchase price. Marketing margin is the difference between the price received by the producers (Farm-gate price) and the price paid by the consumers (Retail price). Total marketing margins include marketing costs and profit or loss incurred by all intermediaries in the marketing channel. Total marketing profit is the sum of profits that are made in a different step of a marketing chain by the intermediaries excluding the marketing cost. Finally, fishermen share percentage is the

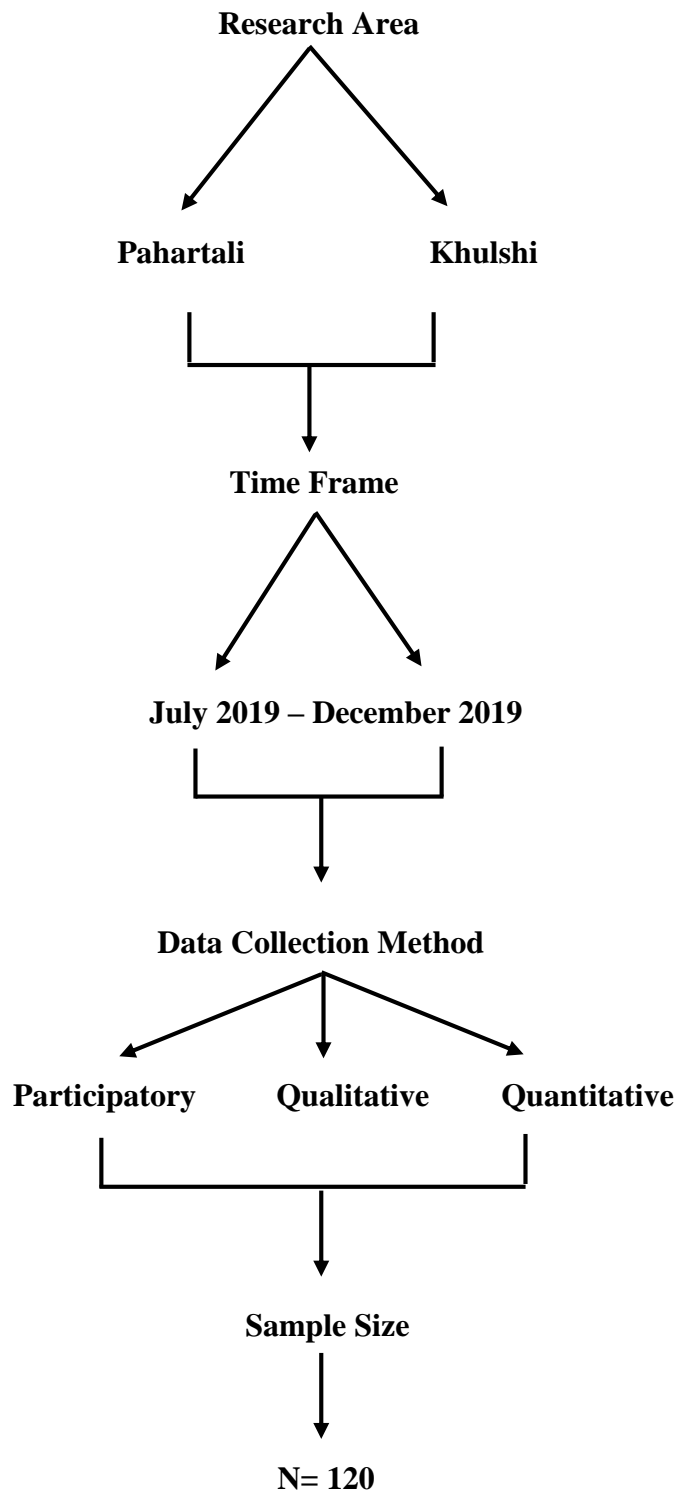


amount fishermen or producers get from the final sales price in the consumer market. Microsoft Excel software was used for calculation. Some equation were provided for calculating marketing margin, marketing profit and fishermen's share in the consumer market by Ahsan et al. (2016)

$$\text{Total marketing margin (\%)} = \frac{\text{Consumer purchase price} - \text{Fishermen sales price}}{\text{Consumer purchase price}} \times 100$$

$$\text{Total marketing profit} = \text{Total marketing margin} - \text{Total marketing cost}$$

$$\text{Fishermen share on sales price (\%)} = \frac{\text{Fishermen sales price}}{\text{Consumer purchase price}} \times 100$$



**Figure 2: Experimental design**



**Figure 3 & 4: Data collection at the primary market (Landing center)**



**Figure 5 & 6: Data collection at the secondary market (wholesale and cold storage)**



**Figure 7 & 8: Data collection at the consumer market**

## **Chapter IV: Results**

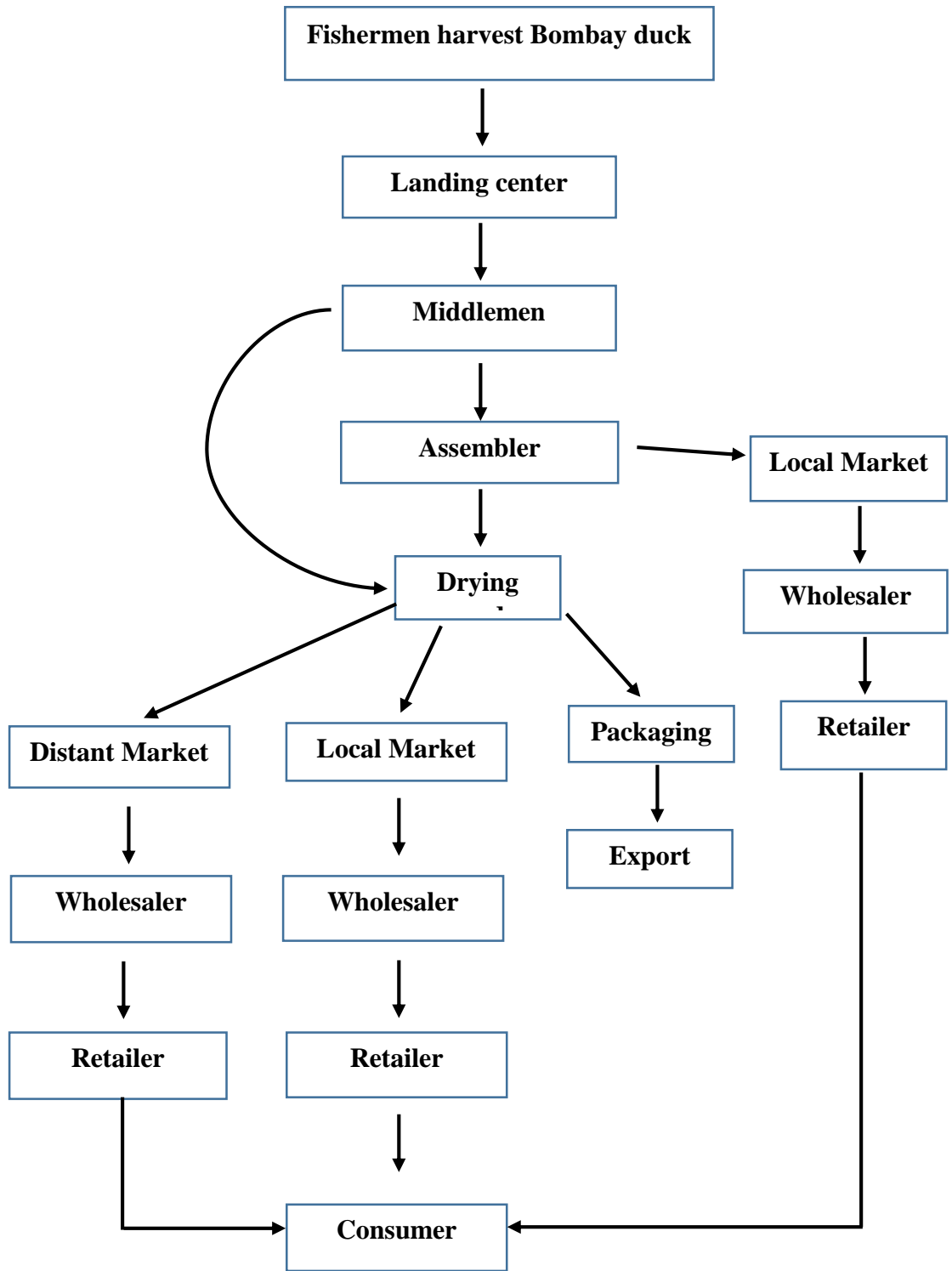
Three levels of market or marketing systems were observed in the distribution channel of fish trade: primary, secondary and final consuming markets. A primary market is the landing area of harvested fishes. A secondary market is a place where collectors brought the fish from the primary market to the consumer market. Sometimes those fishes are also stored in the freezer for later sale. The final consumer market is managed by the retailers where they sell fishes directly to the consumers.

### **4.1 Marketing channels for Bombay duck:**

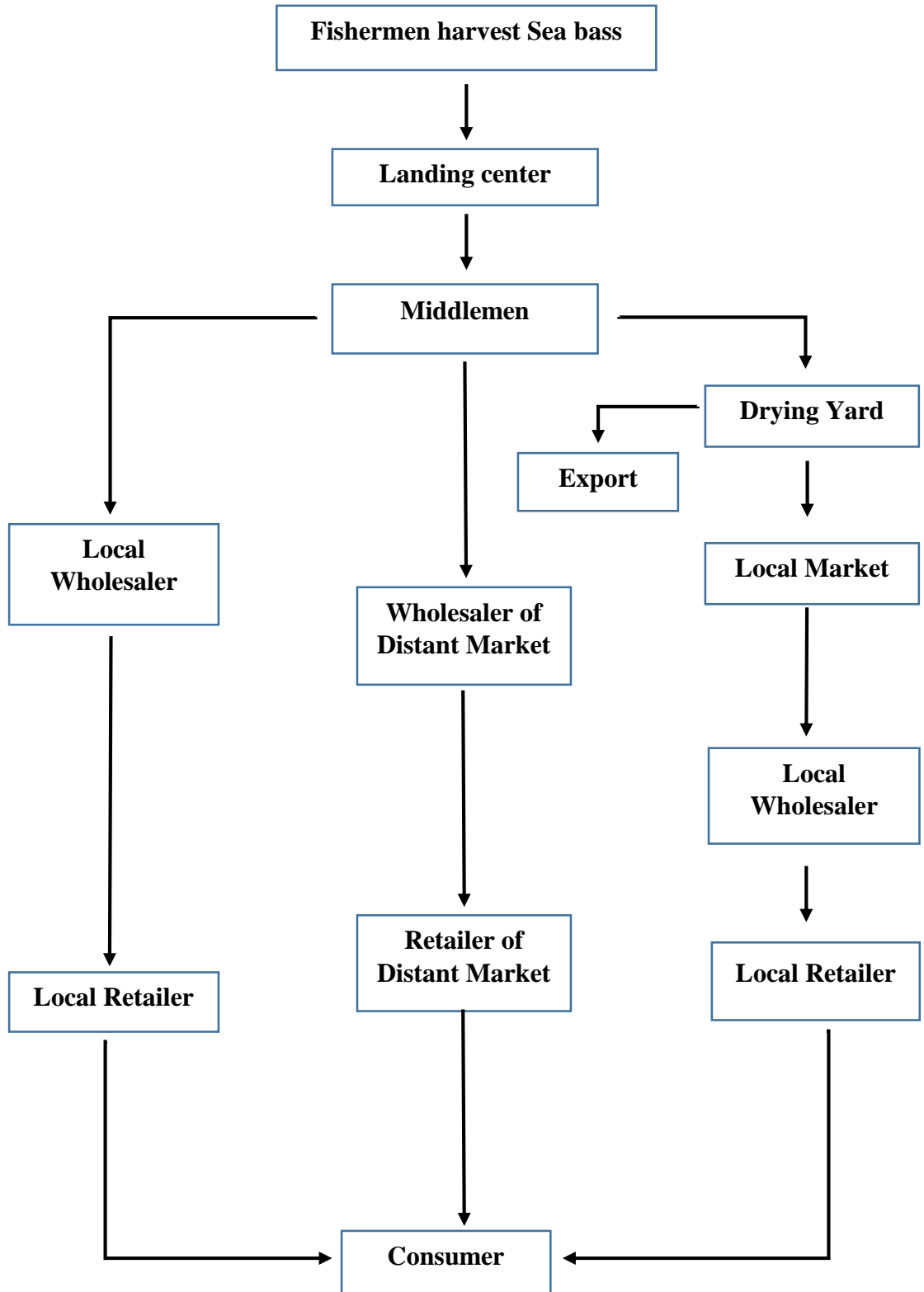
Several marketing channels were found in the marketing system of Bombay duck. In case of marketing channel 1, Bombay duck reaches the local consumer from fishermen through aratdar, local market, local wholesaler and local retailers. And in case of marketing channel 2, Bombay duck reaches the consumer as dried fish. Fishes are brought to the drying yard from fishermen through the middleman or assembler. From the drying yard, dried Bombay duck reached to distant consumers through distant wholesaler and distant retailer with proper packaging. In case of marketing channel 3, dried Bombay duck reached to the local consumer from drying yard through local wholesalers and local retailers. Finally in case of marketing channel 4, dried Bombay duck reach to export market directly from the drying yard for exporting abroad. (Figure 9)

### **4.2 Marketing channels for Sea bass:**

Several marketing channels were found in case of Sea bass as well. In marketing channel 1, Sea bass are taken to the drying yard from fishermen through the middleman or assembler. From the drying yard, dried Sea bass are brought to local consumers, local wholesalers and local retailers. In marketing channel 2, dried Sea bass are presented to the distant consumer from the drying yard through distant wholesalers and distant retailers. In marketing channel 3, dried Sea bass reach to export market directly from the drying yard. In marketing channel 4, Sea bass transferred to distant consumers from fishermen through landing center, wholesaler/aratdar, of distant market and retailer of distant market. In marketing channel 5, Sea bass reaches local consumers from fishermen through middlemen, local market, local wholesalers and local retailers (Figure 10).



**Figure 9: Marketing channels of Bombay duck**



**Figure 10: Marketing channels of Sea bass**

### **4.3 Marketing margin and profit (Bombay duck):**

The total marketing margin for per kg fish was BDT 30 which was 38% of the consumer purchase price and constituted 10%, 14% and 15% in primary, secondary and consumer markets, respectively. Total marketing profit for per kg fish was BDT 16 which constituted of BDT 4, 5 and 7 from the primary, secondary and consumer markets, respectively. Fishermen share to sales price were 86%, 73% and 62% in primary, secondary and consumer market, respectively (Table 2).

**Table 2. Marketing margin and profit of different intermediaries involved in the marketing of Bombay duck in domestic marketing (BDT/kg)**

<b>Market Level</b>	<b>Particulars of Marketing</b>		<b>Price BDT per Kg</b>	<b>% of consumer purchase price</b>	<b>Marketing margin (%)</b>	<b>Fishermen share in the sales price (%)</b>
<b>Primary market</b>	Purchase Price (PP)		48	61%	71-61 = 10%	86%
	Marketing Cost (MC)		4			
	Sales Price (SP)		56			
	Marketing Margin (MM=SP-PP)		8			
	Marketing Profit (MP=MM-MC)		4			
<b>Secondary market</b>	Purchase Price (PP)		56	71%	85-71 = 14%	73%
	Marketing Cost (MC)		5			
	Sales Price (SP)		66			
	Marketing Margin (MM=SP-PP)		10			
	Marketing Profit (MP=MM-MC)		5			
<b>Consumer market</b>	Purchase Price (PP)		66	85%	100-85 = 15%	62%
	Marketing Cost (MC)		5			
	Sales Price (SP)		78			
	Marketing Margin (MM=SP-PP)		12			
	Marketing Profit (MP=MM-MC)		7			
<b>Consumer purchase price:</b>			78	100%		
<b>Total marketing margin: 8+10+12 = 30 (38%)</b>						
<b>Total marketing profit: 4+5+7 = 16 BDT/Kg</b>						



#### **4.4 Marketing margin and profit (Sea bass):**

The total marketing margin for per kg fish was BDT 192 which was 35% of the consumer purchase price and constituted 10%, 11% and 14% in primary, secondary and consumer markets, respectively. Total marketing profit for per kg fish was BDT 105 which constituted of BDT 30, 35 and 40 from the primary, secondary and consumer markets, respectively. Fishermen share to sales price were 87%, 75% and 65% in primary, secondary and consumer market, respectively (Table 3).

**Table 3: Marketing margin and profit of different intermediaries involved in the marketing of Sea bass in domestic marketing (BDT/kg)**

<b>Market Level</b>	<b>Particulars of Marketing</b>	<b>Price BDT per Kg</b>	<b>% of consumer purchase price</b>	<b>Marketing margin (%)</b>	<b>Fishermen share in the sales price (%)</b>
<b>Primary market</b>	Purchase Price (PP)	357	65%	75-65 = 10%	87%
	Marketing Cost (MC)	25			
	Sales Price (SP)	412			
	Marketing Margin (MM=SP-PP)	55			
	Marketing Profit (MP=MM-MC)	30			
<b>Secondary market</b>	Purchase Price (PP)	412	75%	86-75 = 11%	75%
	Marketing Cost (MC)	29			
	Sales Price (SP)	476			
	Marketing Margin (MM=SP-PP)	64			
	Marketing Profit (MP=MM-MC)	35			
<b>Consumer market</b>	Purchase Price (PP)	476	86%	100-86 = 14%	65%
	Marketing Cost (MC)	33			
	Sales Price (SP)	549			
	Marketing Margin (MM=SP-PP)	73			
	Marketing Profit (MP=MM-MC)	35			
<b>Consumer purchase price:</b>		549	100%		
<b>Total marketing margin: 55+64+73 = 192 (35%)</b>					
<b>Total marketing profit: 30+35+40 = 105</b>					

## Chapter V: Discussion

A common indicator of marketing efficiency is the size of the marketing margin which is the difference between the farm-gate price and the next price level such as retail. If the marketing costs and profits are high it leads to the probability of a higher margin. 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. If the capital is huge and there are high risks of losses, the profits may be also high (Rahman et al., 2009).

In the marketing channels, different types of intermediaries such as wholesalers, commission agents, *beparies*, *aratdars*, *paikers* (local market, distant market) and retailers were involved. The present study revealed that Bombay duck had four and Sea bass had five marketing chains with more than five intermediaries each. Different research also shows similar types of intermediaries involved in the marketing chains of a specific marketing channel. The main marketing channel of marine fish in Cox's Bazar and Chittagong districts are fishermen-*beparies-aratdars*-retailers-consumers (Khalil, 1999). The supply chain of fish comprises six intermediaries namely farmer, *aratdar*, *paiker*, trader, retailer and consumer for the distant domestic market (Alam et al., 2012). Three types of marketing channels could be found in the fish markets of Bogura district. These channels were: (a) fish farmers-*paikers*- whole sellers-retailers-consumer (b) fish farmers-whole sellers- retailers-consumers and (c) fish farmers-retailers-consumers (Uddin, 2018). Ahmed et al. (2005) also reported the market chain of Gazipur from farmers to consumers consisted of several intermediaries such as local fish traders, agents, whole sellers and retailers. All those findings clearly show that the marketing channels have more than 4 intermediaries involved which are causing a higher marketing margin.

According to Kohls and Uhl (1980), marketing margin is the price of all utility, adding activities and functions that are performed by the intermediaries. While marketing Bombay duck and Sea bass, the present study has shown that the marketing margin was 38% and 35% of consumer price, respectively. It represents that the marketing margin of both fishes was over 30% of the consumer purchase price. Findings were similar to Islam et al. (2006), who found that the marketing margin of Bombay duck and shrimp

was about 30% of the consumer purchase price. But the marketing margin of Bombay duck was slightly higher than Sea bass in the present study. It because of the value addition and longer marketing channel of Bombay duck compared to Sea bass. Moreover, the marketing margin of some dried marine fishes like Bombay duck, ribbon fish and Jewfish was 28% of the consumer purchase price (Reza, 2002) which represents a similar type of result in case of marketing margin of Bombay duck of this research. There was another research took place on the marketing channel of marine fishes in Cox's Bazar region where the marketing margin was between 25-30% (Ahsan, 2016). The above findings indicate that most of the longer fish marketing channel has 30% or more than 30% marketing margin which increases the gap between the production price and consumer purchase price

In case of fishermen share in the consumer purchase price, the present study shows that fishermen get 62% and 65% of the consumer purchase price in case of Bombay duck and Sea bass respectively. The shorter is the marketing chain, the more is the farmer's share to consumers' pricing (Shrivastava and Ranadhir, 1995). The results were similar to the results of some other studies. In the marketing of some marine fishes, the average share that fishermen received was 68% of the consumer purchase price (Islam et al., 2006). Moreover, Ahmed (1983) reported that the producers received 50% and the traders received 65% share for rohu and shingi respectively. Ali et al. (2008) conducted a study on the economic analysis of fresh fish marketing and found a marketing margin of 38.38%, while the producer's share was 61.62%. Ara et al. (2010) reported that the average marketing margin per quintal of fish for fishermen was 305.56 taka and for *aratder*, *paiker* and retailer were 334.65, 515.80 and 340.40 taka, respectively. Fishermen share was less than 74% in the consumer market in case of Bombay duck and ribbon fish in Cox's Bazar region (Ahsan, 2016). Panikkar and Sathiadhas (1989) observed that fishermen's share in consumers' money varied from an average of about 40% for cheaper varieties of fish to about 65% for high priced varieties in Kerala, India. Sabur and Rahman (1977) found that the average fishermen's share of the consumers' price was 60-63% depending on whether they sold fish on land or at sea. Ahmed (1983) reported that the producers were receiving 50-65% of the retail price. The bulk of the marketing margin was earned by the assembler and the distributor and the retail margin was only 5-10% of the consumer's price. Findings of both present study and mentioned studies represent that usually fishermen receive a small share of the price from the fishes

caught. Farmer's share of consumer's price was found to be inversely related to the length of the marketing channel (Parween et al., 1996)

In some cases, the fish producers usually contact the local fish supplier before harvesting of fish, and the local agents purchase the fish at the landing sites and carry them to the fish markets. Here they make a small profit to the tune of 5-10% of the farm price (Uddin, 2018). On the other hand, some of the local agents do not invest any capital rather they act as commission agents at 3-5% commission for sending the fish to the market. The role of local suppliers in the present study is very much in line with the observation of Rokeya et al. (1997) who reported that local agents collect and purchase fish from the farmers on a commission basis in Rajshahi fish market. Local fish traders earned a profit of 1-5% of the sale proceeds of fish at wholesale price. Alam et al. (2010) also identified a similar market chain in Swarighat of Dhaka district.

The production and marketing of fish is a profitable business. People may earn a substantial amount of cash income all year round by which the incumbents may improve their economic condition. Therefore, efficient production and marketing of fish may be considered as a means of social and economic change for those who are engaged in this business. There is scope for increasing the farmer's share by reducing the cost of marketing.

The improvement of an efficient fish marketing system from the present status depends upon the overall level of national development. The whole system should be improved by taking vigorous attempts with a careful and detailed evaluation of the problem. Dismantling the market power used by traders can be an example. Moreover, if there are any problem exists in transport, storage, or handling should be solved without any delay. At the national or policy level, an important role of government should also be played to improve marketing by the means of proper price policies, training and extension work in marketing and management of relevant market research. Strengthening the bargaining power of the farmers by providing the actual information about the present market status, pricing policy, credit facilities and above all, the formation of association is the right supervision.

## **Chapter VI: Conclusion**

The market price of the Bombay duck and Sea bass seemed to be increasing step by step and were at the highest level when they reached to the consumers. The reason behind this was the people who were involved at every step of the marketing chain making a profit from it. That is why the price at the catching area was low but high at the consumers level. Thus fishermen's share in the consumers' purchase price was low in the marketing channel of Bombay duck and Sea bass. It results in a continuous lower socio-economic condition of the fishermen. For increasing the productivity of fishers and ensuring their livelihood security, an efficient fish marketing system is a vital requisite. Besides the unstable pricing of fishes, some other constraints and limitations were found in the marketing of marine fishes especially Bombay duck and Sea bass. Poor sanitary conditions, inadequate infrastructure, higher transport costs, unstable production and price, political disturbance are some of the other major causes that hamper the real marketing system. Special care should be taken in handling, packaging and transportation of fish before placing fresh fish for sale to the consumers, establishing improve season based modern storage system, as well. The intervention of the government and non-government organizations in the marketing channel is badly needed to develop a fish marketing system for marine fishes like Bombay duck and Sea bass, ultimately for the improvement of the economic condition of the fishermen.

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**Annex- I: Thesis Survey Questionnaire: Marketing Channel of Bombay duck and Sea bass**

My name is Siam Mohammed Abdulah and I am currently studying for a Masters in Chattogram Veterinary and Animal Sciences University. I am conducting a research on the marketing channel of Bombay duck and Sea bass. The questionnaire contains 14 questions and will take no longer than 10 minutes to complete.

Place of interview  Date

Name of interviewee

**(Please tick the box provided and write down the appropriate answer in the blanks)**

**1. Category of engagement in fisheries.**

Fisherman       Depot owner       Fish trader       Retailer

Other.....

**2. Experience of work**

Less than 1 year       1 to 5 years       5 to 10 years       More than 10 years

**3. Your activity engage with which species?**

Bombay duck       Sea bass       Both       None

**4. From where you collect fish? (Bombay duck)**

From sea       From fishermen       From depot owners       From fish traders

Other.....

**5. From where you collect fish? (Sea bass)**

From sea       From fishermen       From depot owners       From fish traders

Other.....

**6 Where do you sell fish? (Bombay duck)**

To fish traders       To depot owners       To retailers       To customers

Other.....

**7 Where do you sell fish? (Sea bass)**

To fish traders     To depot owners     To retailers     To customers

Other.....

**8 Buying price per kg? (Bombay duck) .....**

**9 Buying price per kg? (Sea bass) .....**

**10 Selling price per kg? (Bombay duck) .....**

**11 Selling price? (Sea bass) .....**

**12 Marketing cost per kg? (Bombay duck) .....**

**13 Marketing cost per kg? (Sea bass) .....**

**14 Problems and Constrains in fish marketing .....**

**Signature of interviewer .....**

## **Brief Biography**

Siam Mohammed Abdullah passed the Secondary School Certificate Examination in 2012 and then Higher Secondary Certificate Examination in 2014. He obtained his B.Sc. (Hon's) in Fisheries from the Faculty of Fisheries of Chattogram Veterinary and Animal Sciences University, Chattogram, Bangladesh. Now, he is a candidate for the degree of Master of Science in Marine Bioresource Science under the Department of Marine Bioresource Science, Faculty of Fisheries, Chattogram Veterinary and Animal Sciences University (CVASU). His research interests are marine biology, oceanography, fish marketing channel analysis, estuarine and marine ecology, coastal zone management, the culture of marine fish and seaweeds, etc.