

# Physically visiting the markets and use of telephone mobile phone

[Technology](#), [Mobile Phone](#)



Marketing of Major Fish Species in Bangladesh: A Value Chain Analysis a power of fishries industry loaded with more documents Physically visiting the markets and use of telephone/mobile phone are the common sources of collecting market information for all value chain actors. Fellow traders are also a source of market information for the value chain actors except processing plants. Processing plant and LC paikers mainly depend on email/internet to obtain market information

Md. Ferdous Alam Research Fellow, Institute of Agricultural and Food Policy Studies, Universiti Putra Malaysia, Malaysia Md. Salauddin Palash Assistant Professor Department of Agribusiness and Marketing, Bangladesh Agricultural University, Mymensingh, Bangladesh Md. Idris Ali Mian Professor, Department of Agribusiness and Marketing, Bangladesh Agricultural University, Mymensingh, Bangladesh Madan Mohan Dey

Professor, University of Arkansas at Pine Bluff, USA November 2012

---

A report submitted to Food and Agriculture Organization for the project entitled A Value-chain Analysis of International Fish Trade and Food Security with an Impact Assessment of the Small-scale Sector Marketing of Major Fish Species in Bangladesh: A Value Chain Analysis Table of Contents Section | Section title | Page | | | Glossary of terms | iv | | | Abbreviation | v | | | Weights, Measures and Conversions | v | | | Local and Scientific names of the species of fish considered | v | | | Acknowledgements | vi | | | Executive Summary | vii | | 1 | Introduction ... .. | 1 | | 2 | Statement of the Problem ... .. | 2 | | 3 | Methodology ... .. | 3 | | 4 | Results and Discussion

...	5	4. 1	Overview of fish marketing practices	...
...	5	4. 1	Buying and selling	...
...	10	4. 13	Storage	...
...	11	4. 14	Transportation	...
...	11	4. 15	Financing	...
...	13	4. 6	Market Information	...
...	15	4. 17	Packaging	...
...	16	4. 18	Pricing	...
...	17	4. 2	Fish Marketing Channels	...
...	17	4. 3	Characteristics of Market Participants	...
...	21	4. 4	Value addition costs by different actors	...
...	23	4.	Marketing Margin	...
...	28	4. 6	Distribution of Value Addition Cost and Net Profit	...
...	32	4. 7	Intermediaries Share to Consumers' Taka	...
...	33	5	Conclusion	...
...	34		References	...
...	39		List of Tables	...
			Table	...
			Title of tables	...
			Page	...
	1			...
...	5	2	Distribution of samples from different areas	...
...	6	3	Percent of tilapia fish transacted by value chain actors	...
...	6	4	Percent of Rohu fish transacted by value chain actors	...
...	7	5	Percent of Catla fish transacted by value chain actors	...
...	8	6	Percent of Pangas fish transacted by value chain actors	...
...	8	7	Percent of hilsha fish transacted by value chain actors	...
...	9	8	Sources of finance of major carps, pangas, and tilapia fish	...
...	14		Farmers and intermediaries	...
...	9		Sources of finance of hilsha fish	...
...	14	10	Sources of finance of shrimp farmers and intermediaries	...
...	15	11	Sources of market information for Farmers and intermediaries	...
...	15	12	Pricing methods followed in selling fish in Bangladesh	...

| | 13 | Total marketing cost of different intermediaries involved with major carps, pangas and tilapia marketing | | | |... .. | 24 | | 14 | Total marketing cost of different intermediaries involved with hilsha marketing | | | |... .. | 25 | | 15 | Total marketing cost of different intermediaries involved with shrimp marketing... .. | | | | 27 | | 15 | Total marketing cost of different intermediaries involved with shrimp marketing (continued) | | | |... .. | 27 | | 16 | Marketing margin of Aratdar involved with major carps, pangas and tilapia marketing | | | |... .. | 29 | | 17 | Marketing margin of Inter-district Paiker involved with Pangas fish marketing | | | |... .. | 30 | | 18 | Marketing margin of Paiker involved with major carps, pangas and Tilapia marketing | | | |... .. | 30 | | 19 | Marketing margin of Retailer involved with major carps, pangas and tilapia marketing | | | |... .. 30 | | 20 | Average net marketing margin of different intermediaries for major carps, pangas and tilapia fish | | | | marketing in Bangladesh ... .. | 31 | | 21 | Average net marketing margins of different intermediaries involved with hilsha fish marketing | | | |... .. | 31 | | 22 | Average net marketing margin of different intermediaries involved with shrimp marketing in Bangladesh | | | |... .. | 32 | | 23 | Percentage distribution of value addition cost and profit by intermediaries and fish marketing system| | | |... .. | 33 | | 24 | Share of intermediaries to in consumer's Taka according to distribution channel ... .. | | | |... .. | 34 | List of Figures Figure | Title of figures | Page | | 1 | Mode of transport used by farmers and intermediaries for movement of major carps, pangas and tilapia | | | |... .. | 11 | | 2 | Mode of transport used by farmers and intermediaries for movement of

Shrimp ... .. | | | ... .. | 12 | | 3 | Mode of transport used by farmers and intermediaries for movement of Hilsha ... .. | | | ... .. | 13 | | 4 | Value chains of major carps, pangas and tilapia | | | in Bangladesh ... .. | 18 | | 5 | Value chains of hilsha in Bangladesh ... .. | 19 | | 6 | Value chains of shrimp in Bangladesh ... .. | 20 | | 7 | Components of costs for carps, pangas and tilapia ... .. | 26 | | 8 | Components of costs for Hilsha ... .. | 26 | | 9 | Components of costs for Shrimp ... .. | 26 | List of Boxes

Box	Title of Boxes	Page
1	Grading practices of different species of fishes ... ..	10
2	Packaging practices of fish marketing in Bangladesh ... ..	16

Glossary of Terms | Arat | Generally an office, a store, or a warehouse in a market place from which an Aratdar conducts his | | business | | Aratdar | Main actor in the fish distribution system.

An Aratdar arranges or negotiates sales for the sellers | | | on a commission basis. He often acts as a wholesaler. He is also a main provider of fisheries credit | | | to the fishers | | Paiker/Bepari | A Paiker is a middleman in the fish marketing chain; often covers the assembly function in the chain, | | | acting as Dadandar at the same time; depending on the location sometimes also referred to as | | | wholesaler or retailer. They are also called Bepari | Nikari | A Nikari is an informer middleman who does not have the ownership of fish but sets a bridge between | | | buyers and sellers and receive commission from Farmers and fishers | | Faria | Farias are intermediaries usually operating in the hilsha marketing process who purchases small | | | quantity of fish from fishermen far away from the market and carry it to the terminal point and sell | | | it to Aratdar or retailer | | LC Paiker | These intermediaries

purchase hilsha fish from fishermen through Aratdar and export to overseas |  
 | | market. They are authorized LC (Letter of Credit) holder to export. | |  
 Account Holder | They are intermediary and operate in the shrimp supply  
 chain. They act as the commission agent and | | | constitute the major profit  
 making actor in the shrimp value chain. Account Holders are very powerful | |  
 | as they are the party who supply shrimp to the processing plants.  
 Processing plants are made to buy | | | shrimp from the Account holders only.  
 | Dadan | This is a kind of loan given to the fishermen by Aratdars and  
 mohajans (traditional moneylenders) | | | on condition that fish are required  
 to be sold to them compulsorily. Sometimes prices are | | | predetermined | |  
 Koyal | Koyals are persons who conduct the auction for the Aratdars. They  
 organize the auction by offering | | | initial price of the lot to the assembled  
 buyers. They then loudly inform the prices offered by the | | | buyers before  
 the auction participants. The process is repeated by them until final price is  
 fixed | | | up. | Abbreviations Acronym | Full title | | FAO | Food and  
 Agricultural Organizations of the United Nations | | DoF | Department of  
 Fishery | | ADB | Asian Development Bank | | FGD | Focused Group  
 Discussions | | LC | Letter of Credit | | NGO | Non-government Organizations |  
 | Tk | Taka, Bangladesh Currency | | USDA | United States Department of  
 Agriculture | Weights, Measures and Conversions Exchange rates (Jan 2011)  
 1 US dollar (\$) = Tk75. 00 1 Maund = 40 Kg Local and Scientific names of the  
 species of fish considered Local name | Scientific name | | Rohu | Labeo  
 rohita | | Catla | Catla catla | | Pangas | Pangasius hypophthalmus | | Tilapia |  
 Oreochromis nilotica | | Hilsha | Tenulosa ilisha | | Giant Tiger Shrimp |  
 Penaeus monodon . | | Giant River Prawn | Macrobrachium rosenbergii | |

Vannamei (whiteleg) shrimp | Litopenaeus vannamei | | | |

## Acknowledgements

The authors wish to thank the Food and Agriculture Organization (FAO) of the United Nations and Norwegian Agency for International Development (NORAD) for the technical implementation and funding respectively of the project entitled “ A Value-chain Analysis of International Fish Trade and Food Security with an Impact Assessment of the Small-scale Sector”. We are also grateful to Dr. Audun Lem, Senior Fishery Industry Officer, Policy and Economics Division, Fisheries and Aquaculture Department of FAO, Rome, for providing overall administrative support in conducting the project activities. The authors express sincere appreciation to Professor Dr.

Trond Bjorndal, Director, CEMARE, the University of Portsmouth, UK for his keen interest in this value chain paper. His critical comments and professional suggestions have been highly helpful in organizing the paper. Prof. Dr. Daniel V Gordon of the University of Calgary, Canada deserves appreciation for his suggestions and comments during the value chain study workshop held in Japan, which helped the authors to organize the paper. The authors express sincere appreciation to the graduate students of the Faculty of Agricultural Economics and Rural Sociology, Bangladesh Agricultural University, Mymensingh, for conducting the field surveys in various fish markets.

The opinions of the participating members of the focused group discussion conducted in Khulna have been highly valuable and the authors thank them for their input. The different fish market intermediaries, who by sacrificing

their valuable time, participated in the survey are also highly appreciated. Finally, the first author expresses deep sense of gratitude to the Institute of Agricultural and Food Policy Studies and the Universiti Putra Malaysia for approving him to be involved in this project. Executive Summary Background of the project Food and Agriculture Organization (FAO) of the United Nations is implementing a research project entitled a value-chain analysis of international fish trade and food security with an impact assessment of the small-scale sector with the financial support of NORAD.

The objective of the project is to achieve a better understanding of the dynamics of relevant value-chains in international fish trade and arrive at policy recommendations. The project aims at analyzing the distribution of benefits in the value-chain and the linkages between the relative benefits obtained as well as the design of the chain. The project also aims at making comparisons between domestic, regional and international value-chains with the view to understand better how developing countries can increase the value derived from their fishery resources. Twelve countries (10 developing and 2 developed countries) are participating in this project including Bangladesh. This report is based on the cross section component of the value chain analysis of Bangladesh fish marketing. Objectives of the study

The study addresses the overall fish marketing system of Bangladesh with particular emphasis to the extent of value addition during the process of marketing of rohu, catla, pangas, tilapia, hilsha and shrimp. The specific objectives of the study are to: i) identify different marketing channels and intermediaries involved therein and their roles in fish marketing, ii)



determine the extent of value addition in terms of costs in successive stages of fish movement, and iii) determine marketing margins of the intermediaries. A related, complementary study deals with price transmission mechanism across seafood value chain in the country (Sapkota-Bastola et al. 2012) Location of study and data

The study is conducted in i) Trishal, Bhaluka and Muktagaca upazila (sub-district) under Mymensingh district of north-central Bangladesh, ii) Dupchacia sub-district under Bogra district of northern Bangladesh, iii) Dumuria sub-district under Khulna district of southern Bangladesh, iv) Sadar sub-district of Chandpur district of south-central Bangladesh, and v) Jatrabari area of Dhaka district. A combination of participatory, qualitative and quantitative methods is used for primary data collection. Total sample size of the study is 200 comprising of 35 Farmers, 75 brokers and marketing agents, 5 depot owner, 2 processing plants and 73 retailers. Value chains (marketing channel) The longest supply chain involves six intermediaries for live Pangas (fish farmer, nikari, paiker, aratdar, retailer and consumer).

Two supply chains identified for carps and tilapia involve five intermediaries (fish farmer, aratdar, paiker, retailer and consumer) and 4 intermediaries (fish farmer, aratdar, retailer and consumer) respectively. Supply chain of hilsha comprises of six intermediaries, namely fishermen, aratdar, paiker, aratdar, retailer and consumer for the distant domestic market. Two other identified channels for hilsha marketing involve respectively five intermediaries (fishermen, aratdar, paiker, retailer and consumer) and four intermediaries (fishermen, aratdar, retailer and consumer) for the local

markets. The overseas hilsha marketing channel involves four intermediaries namely, fishermen, aratdar, LC paiker and overseas consumers.

Domestic supply chains for shrimp marketing involve four intermediaries (shrimp farmer, aratdar, retailers and consumer) for local market and five intermediaries (shrimp farmers, aratdar, paiker, retailer and consumers) for distant markets. Three overseas supply chains are identified for shrimp marketing. The involved intermediaries are at most six, namely, shrimp farmer, aratdar, bepari, account holder, processing plant and overseas consumer. Characteristics of intermediaries Fish farmers and fishermen are the first link in the fish marketing channels. They are the supplier of fish to the market. Nikari (informant) is a middleman who does not have the ownership of the product but establishes a bridge between buyers and sellers and receive commission from farmer @0. 50 Taka/kg in the study areas in case of major carps.

Faria, another type of intermediary, is found in hilsha marketing system who purchases a small quantity of fish from fishermen far away from the market and carry it to the terminal point and sell it to aratdar or retailer in the study areas. Paiker or bepari handles large volume of fish. They purchase fish from fish farmers at farm or through aratdar in the local market and sell them to the retailers through aratdar or commission agent in secondary market. LC paiker (licensed trader/exporter) purchase hilsha fish from fishermen through aratdar and sell (export) their entire product to overseas market. Aratdars negotiate sales of fish on behalf of the producers/ seller. Aratdars arrange

selling of fish through an auctioning system and receive a commission. Aratdars often act as a supplier of dadan.

Shrimp depot owners are the permanent shopkeepers having their own premises and staffs in markets and act as the middle functionary between farmers and commission agents. Their shops (establishments) are called ' Depot'. This group of traders mostly offers dadon - cash as loans to farmers, in return for buying the shrimp at a pre-fixed price, which may be well below the market level. Account holders act as the commission agent and constitute the major profit making actors in the shrimp value chain. They finance paikers and farmers and give credit to the processing plants. Retailers, the last intermediaries of fish marketing channel, do not have any permanent establishment but they have fixed places to sit in the market places or wandering with hari (aluminium pot) on head from door to door.

#### Buying and selling

Farmers (producers) sell 5-12% of rohu, catla, and tilapia directly to paikers and 85-95% is passed on to aratdar and subsequently purchased by paiker . Only a small portion is sold directly to retailers. For pangas, farmers sell 54% to paiker directly, 46% indirectly to paiker via aratdar and only 3% to retailers. Hilsha shows a different picture where fishers sell 16% to faria directly. Most intermediaries purchase fish from aratdars. In the study, 24% goes to faria, 16% to paikar, 12% to LC paiker and 32 % to retailers via aratdars. For shrimp, major portion (65%) is sold to bepari and paiker through aratdar. Depot owner is also an important party for the farmers to

sell shrimp. Paikars and retailers transact (buy and sell) most of the traded fish through aratdars.

Thus aratdar is the most important intermediary in the fish marketing chains and is only involved in negotiating sales on behalf of the sellers on a commission basis. In general, farmer/fisher, aratdar, paiker, and retailers are the important intermediaries playing notable role in the marketing of fish. Account holders are intermediaries and operate in the shrimp supply chain. They act as the commission agent and constitute the major profit making actor in the shrimp value chain. Account holders play a significant role in shrimp marketing. Marketing functions Grading Grading is an important activity in fish marketing as different sizes of fish fetch different prices.

Grading facilitates buying and selling of fish. Most fish are graded on the basis of size (weight). However, in the case of hilsha, location (source of capture/catch) is also a factor in the grading procedure. Hilsha harvested from river (river Padma) and from sea (called fishes from Nama's) are often differentiated in terms of their prices. Usually, hilsha caught from Padma river fetch higher price. Fish are graded into three categories namely, small, medium and large depending on size (weight). However, weights across species vary depending on species graded. Shrimp has a different grading system than fish. Here grading is based on number of pieces forming one kg.

### Storaging

The storage function is primarily concerned with making goods available at the desired time. It enables traders to obtain better prices for their products. Being a highly perishable commodity, fish requires extremely specialized

storage facilities matching the seasonal demand. In the shrimp industry, only the processing plants use proper storage systems in order to be able to export to the world market. Other intermediaries use only ice to transport fishes from one place to another. Surprisingly, no refrigerated van is used in Bangladesh to transport fish. Live pangas is transported from one place to another place using water in the plastic drums. Transporting

Fish farmers and intermediaries use various modes of transportation such as van, rickshaw, truck, passenger bus, pickup, Nasimon (locally made pick-up type van for transporting passengers and goods), head load etc, to transfer products from the producing areas to the consumption centres. Ice is used while transporting the fish as most carriers are non-refrigerated. Rohu, catla, hilsha and other assorted fish often are sold in the urban areas with refrigerated vans to a very limited scale by the DoF, BFDC and some private firms. Financing Most of the fish farmers/ fishermen, aratdars, paikers and are self-financed. Other sources of finance for the farmers are banks, friends and relatives, and dadon. Aratdars and paikars also borrow from banks, NGOs, and friends and relatives.

However, finance of hilsha fishermen come totally from aratdar/mahajon (who provides dadan). Fishermen receiving dadon from aratdars/mohajans are bound to sell their produce to them, sometimes at predetermined prices, which in most cases are lower than prevailing market prices. Farmer, aratdar, bepari and retailer involved in shrimp transaction are self-financed. Depot owners use a combination of own fund, bank, NGO and aratdars for shrimp financing. Paikers use dadon from aratdars besides their own fund to

run their business. Account holders partly and processing plant owners mostly depend on bank loans to accelerate the business operations. Market information

Physically visiting the markets and use of telephone/mobile phone are the common sources of collecting market information for all value chain actors. Fellow traders are also a source of market information for the value chain actors except processing plants. Processing plant and LC paikers mainly depend on email/internet to obtain market information. Packaging ' Bamboo, tied with rope and polythene is used by farmers, paikers and retailers of major carps, pangas and tilapia fish for packaging. Agents also use plastic drum to transport fish (mostly pangas) in live form. Now a day's ' plastic crate' is commonly used by all types of intermediaries in Bangladesh. Steel and wooden' box are used in hilsha fish marketing by paikers, beparis and LC paikers. ' Box' made of cork sheet is widely used by Account holders and processing plant owners in shrimp marketing and LC paikers in hilsha fish marketing. Pricing Depot owner, bepari and account holder of shrimp marketing chain follow prefixed prices set by the processing plants. Farmer, aratdar, paiker, LC paiker, and processing plants practice open bargaining, auction and going market prices method for fixing price of their products in varying degree. Retailers follow open bargain for selling their fish to consumers. Value addition Value is added when products pass different stages and move from one intermediary to another.

The different cost components required for successive movement of fish are transportation, basket packaging, icing, wages and salaries, aratdar's

commission, house rent, security, electricity, telephone, personal expenses, tips-donation, wastage, dadon cost, government taxation, subscription for cooperatives (for hilsha), export packaging (shrimp). Total value added cost per maund (40 kg) is Taka 953. 13 for carps, pangas and tilapia; Taka 3707 for hilsha and Taka 5036 for shrimp. For carps, pangas and tilapia. The top three cost components are transportation, aratdar's commission, and icing. For hilsha, the cost items are aratdar's commission, transportation, and basket (packaging). For shrimp, the top three cost additions are aratdar's commission, transportation, and salaries for shrimp. Marketing margin

Net marketing margins per maund of carp, pangas and tilapia for farmers, aratdars, inter-district paikers, paikers and retailers are Tk3257, Taka 54, Taka 194, Taka 337 and Taka 633 respectively. The net margins of hilsha are Taka 297 for aratdars, Taka 228 for inter-district paikers, Taka 902 for LC paiker, Taka 520 for paiker and Taka 1223 for retailers. Farmer's net marketing margin per maund of shrimp is Taka 20366 followed by processing plant (Taka 1650), retailer (Taka 1524), paiker (Taka 1417), depot owners (Taka 1006), bepari (Taka 720) and aratdar (Taka 201). Retailers enjoy the lion's share of the total marketing margin. Distribution of value addition cost and profit For major carp, pangas and tilapia, major cost and profit are borne by paikers (32. 03 % of the total cost) and retailers (51. 8 % of the total net profit) . For hilsha and shrimp marketing, major costs are incurred by inter district beparis, LC paikers, paikers and fishermen but major net profits are reaped by retailers and processing plant owners . Farmers in shrimp marketing bear the major marketing cost (23. 70 % of total cost) because they have to pay the aratdar's commission. Farmers' share of consumer

Taka Farmers' share of the consumers prices for different fishes seem to be reasonable except for hilsha fish. Farmer received 67%, 72% and 76% share of the consumer's Taka for major carp-pangas-tilapia, shrimp (overseas value chain) and shrimp(domestic value chain) respectively.

However, for hilsha, the major share (46%) of consumer Taka goes to mahajon, and fishermen receive only 31%. Price spread per kg ranges from Taka 39. 83 to Taka 177. 50. Conclusions and recommendations The study reveals that the value chain of major carps, pangas, tilapia, hilsha and shrimp are long and very complex. Fish flows to a number of channels from the producing centers. Fish sold in a particular market may originate through more than one channel. There are involvements of many intermediaries in the channel. Involvement of some intermediaries seems to be redundant whose presence just adds a cost to the consumer and a loss to the fisher.

Fish purchased by consumers in Bangladesh mostly consists of the primary product and does include limited marketing services. Non-existence of good road and transport networks with the landing (assembling) centers deprive small-scale artisanal riverine fishers to get fair price due to their inability to sell directly to the assembling points/landing centers Contact fish farming arranged by some super stores tend to reduce the existence of number of intermediaries making the channel shorter. Bulk of the fish sold in the markets is unprocessed. An emerging new phenomenon in fish marketing in Bangladesh is the availability of fish in super markets, who are increasingly becoming important retailers.



Beparies and paikers bear the most cost of marketing while retailers enjoy the lion's share of the profit. Farmers receive relatively higher share (approximately 70%) of the retail value for all species under study except for hilsha. Though fish marketing in Bangladesh is beset with a number of problems, there have been a number of positive changes that are expected to improve fish marketing environment in the country. These positive drivers include, i) the shift from subsistence to commercial fish farming, ii) emergence of super-markets, and iii) a changing social attitude towards fish marketing, as it is increasingly considered as a less dishonourable job as was thought in the past.

Although private bodies control the most of fish marketing, for better fish marketing, government should also play active role in providing physical facilities like refrigerated storage, refrigerated vans, good market places with related facilities like water, ice, electricity, drainage facilities and sitting arrangements etc. Development of road networks is greatly needed, which is a responsibility of the government. Monitoring needs to be done to ensure that market regulations are be strictly followed. 1. Introduction Large number of different types of water bodies both inland and marine makes Bangladesh one of the most suitable countries of the world for freshwater aquaculture. The freshwater inland aquaculture production in Bangladesh is the second highest in the world after China (FAO, 2009).

The total annual fish production is estimated at 2.90 million tonnes in 2009-10 (Bangladesh fiscal year: 1 July-30 June), of which 1.35 million tonnes (46.62%) are obtained from inland aquaculture, 1.02 million tonnes (35.53%)

from inland capture fisheries, and 0.52 million tonnes (17.85%) from marine fisheries (DoF, 2010). The main production systems for freshwater aquaculture in Bangladesh are extensive and semi-intensive pond polyculture of Indian major carps and exotic carps, which account for 80% of the total freshwater aquaculture production. The remaining 20% are mainly from catfish, tilapia, small indigenous fish and rice-fish farming (ADB, 2005). Presently, 1 million people are engaged full time and 12 million as part time in fisheries sector in the country for livelihood and trade. Another 3.08 million fish and shrimp farmers are cultivating fish both at subsistence and commercial level (Shah and Ahmed, 2006). In Bangladesh, fish farming is currently one of the most important sectors of the national economy. Within the overall agro-based economy of the country, the contribution of fish production has been considered to hold good promise for creating jobs, earning foreign currency and supplying protein. About 97% of the inland fish production is marketed internally for domestic consumption while the remaining 3% is exported (Hasan, 2001).

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, Islam, 1996; DFID, 1997; Kleih, 2001a? 2001b). Traditionally, people of Bangladesh like to eat fresh fish. However, chilled and dried fish are also marketed currently in large quantities in the towns and cities. Utilization and marketing distribution of fish is around 70% fresh fish, 25% dried, and the other forms of locally processed fish include fermented products and frozen products (Islam et al. 2006). The export market of value

added products is highly competitive, involving changes in type of products, forms and packaging as well as consumer behavior.

Export of fish, shrimp and other fishery products were considered as non-conventional items before the independence of the country. It has increased many-folds during the last decades and the country is earning foreign exchange to minimize the trade gap. In this case the dried coastal and marine fish, the marine finfish and organism even other than fish, could be on the top of the list of export earning items (Kamal, 1994). Bangladesh exported fish and fisheries products worth Taka 32, 106 million in 2009-10 of which frozen fish and shrimp shared more than 90% of the total exports of the fishery products and attained 3. 7% of total export earnings of Bangladesh (Bangladesh Bank, 2011).

Since fish production in Bangladesh is increasing over the years, its disposal pattern is very important as growers, wholesalers, retailers and consumers- all are affected due to value addition in the marketing process. For the sustainability of these stakeholders, fish marketing studies are very necessary. Thus, the present study is conducted to examine the fish marketing system, supply chain and value addition to determine the pulling factors for enhancing production, processing and marketing of different species of fishes in Bangladesh.

## 2. Statement of the Problem

The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production and delivery to final consumers (Porter, 1980; Kapilinsky and Morris, 2000).

Value-chain analysis looks at every step a business goes through, from raw materials to the eventual end-user. The goal is to deliver maximum value for the least possible total cost (Investopedia, 2011). Market chain analysis aims to provide information on profitability for the various agents along the market chain (Ferris et al. , 2001). Economic value chain analysis describes the range of activities required to bring a product to the final consumer and, in the case of international products, the extent to which intermediaries/agents gain from participating in the chain (Jacinto, 2004). A traditional food industry value chain consists of the producer, processor, wholesaler, exporter, importer, retailer and consumer.

There are mainly three sets of reasons why value chain analysis is important (Kaplinsky and Morris, 2000). These are: i) with the growing division of labour and the global dispersion of the production of components, systematic competitiveness has become increasingly important, ii) efficiency in production is only a necessary condition for successfully penetrating global markets, and iii) entry into global markets which allows for sustained income growth - that is, making the best of globalisation- requires an understanding of dynamic factors within the whole value chain. Fish is a highly perishable commodity and its quality deteriorates very rapidly.

Therefore, its quality cannot be kept unaffected for human consumption for a long time. Production and consumption areas are also widely separated. Consumers of this country normally like indigenous carps, shrimp, catfish and other small species as food fish. Production of cultured fish can be increased by making best utilization of the existing inland resources through

modern and scientific methods of fish culture and fishing techniques. But the ultimate consumers have to depend on an effective marketing system to be able to purchase fish at reasonable prices. Similarly, successful and sustainable fish culture also depends on an effective distribution system.

Analysis of value chains requires detailed micro-level data, which are not available in Bangladesh and are often difficult to obtain in most countries. The present study takes the first steps to collect primary data and to identify the marketing channels and value addition of tilapia, pangas, rohu, catla, shrimp and hilsha in Bangladesh. This study analyzes how market intermediaries operate along seafood value chains, and demonstrates how the revenue from seafood trade is distributed over the entire seafood value chain. This report also provides information on aquaculture/fisheries products in Bangladesh to support the statistical report linking the value chain in fish supply.

Finally, this study is expected to also provide some useful information to traders, fish farmers and policy makers to help them formulate programmes and policies related to the concerned fish production and marketing. A related, complementary study (Sapkota-Bastola et al. 2012) provides an in-depth analysis of the linkage between various segments in the seafood value chains in the country. The report is organized in 5 sections. Following introduction in the first section and problem statement in the second section, the third section presents methodology followed in the study. Results and discussions are discussed in section 4. Concluding remarks and future fisheries value chains are provided in section 5.

### 3. Methodology

The study was conducted in i) Trishal, Bhaluka and Muktagaca sub-districts under Mymensingh district of north-central Bangladesh, ii) Dupchacia sub-district under Bogra district of northern Bangladesh, iii) Dumuria sub-district under Khulna district of southern Bangladesh, iv) Sadar sub-districts of Chandpur district of south-central Bangladesh and v) Jatrabari area of Dhaka district. These areas have been identified as the most important sources for pangas (*Pangasius hypophthalmus*), rohu (*Labeo rohita*), catla (*Catla Catla*), tilapia (*Oreochromis nilotica*), hilsha (*Tenualosa ilisha*) and shrimp/prawn (*Macrobrachium rosenbergii*, *Penaeus monodon*, and *Litopenaeus vannamei*). Primary data were collected from fish market agents of Trishal, Valuka, Muktagaca and Mechua Bazar of Mymensingh district, Dupchacia and Fate Ali Bazar of Bogra district, Kharnia, Dumuria, Rupsha, 5-No. hat and Moylapota Bazar of Khulna district, Station, Pal Bazar and Biponibag of Chandpur district and Jatrabari, Shanir Akhra, Ajompur and Abdullahpur Bazar of Dhaka district for the study. Surveys were conducted for a period of three months from November 2010 to January 2011. These surveys involved the inspection of the study areas in terms of fish distribution and marketing systems. A combination of participatory, qualitative and quantitative methods was used for primary data collection. A total of 4 Focus Group Discussion (FGD) sessions were conducted with actors involved in fish distribution channel (1 FGD in each area). Table 1 shows the sample intermediaries from different study areas. In this study, purposive sampling technique was used for selecting the sample. Total sample size of the study was 200.

The interview schedules were prepared according to the need of the objectives of the study. In order to collect data, one set of interview schedule for all actors involved in value addition process was prepared. The draft interview schedule was pre-tested amongst a few respondents by the researcher themselves. In this pre-testing much attention was given to elicit new information which was originally not designed to be asked and filled in the draft interview schedules. Thus, some parts of draft schedules were improved, rearranged and modified in the light of the actual experiences gained from the field tests. Then the final interview schedules were prepared based on the result of the pre-test.

After the collection of data they were scrutinized and carefully edited to eliminate possible errors and inconsistencies contained in the schedules while recording them. The first step was to look into the data of each and every interview schedule to ensure consistency and reliability with the aims and objectives of the study. After completing the pre-tabulation task, they were transferred to an Excel sheet from the interview schedules. In this study tabular technique was followed to illustrate the whole scenarios of fish marketing. The sum, mean, averages, percentages, gross costs and margins etc. are the simple statistical measures employed to examine the value chain analysis of different species of fishes. Table 1. Distribution of samples from different areas | Study Area and fish species | | | | | | Respondents | | | | Mymensingh | Bogra | Dhaka | Chandpur | Khulna | | | | Pangas/ | Pangas/ | Pangas/ | Hilsha | Hilsha | Shrimp | Total | | | tilapia/ rohu/ catla | tilapia/ rohu/ | tilapia/ rohu/ | | | | | | | catla/ hilsha | | | | | | | catla | | | | | | Farmer | 10 |

5 | | 5 | 5 | 10 | 35 | | Paiker | 15 | 4 | 3 | | 10 | 3 | 35 | | Total | 56 | 29 | 25 | 20 | 29 | 41 | 200 | 4.

Results and Discussion 4. 1 Overview of fish marketing practices 4. 11 Buying and selling Fish marketing practices in Bangladesh is the combination of a series of functions or services that are performed by several institutions and market participants like marketing agents, brokers, wholesalers, retailer, exporter and manufacturer in order to transfer the products from farm-gate to the ultimate consumers both at home and abroad. Marketing system may be thought of as the connecting link between specialized producers and consumers (Kohls, 2005). An efficient marketing system is essential for earning fair profit for the fish farmers and traders.

Marketing functions may be defined as major specialized activities performed in accomplishing the marketing process of concentration, equalization and dispersion (Kohls, 2005). In the study areas, the whole marketing of fish has been broken down into various functions such as buying and selling, transportation, grading, storing, weighing, financing, market information and pricing. The activities involved in the transfer of goods are completed through buying and selling functions. Aratdars do the functions of negotiation between buyers and sellers of fish and help them at their own business premises on receipt of commission. They do not take the ownership of the products.

Tilapia fish farmers sell 85% of their fish to paiker through aratdar, 12% to paiker directly and the final 3% to retailer. Paikers sell 77% of their fishes to retailers and 23% to retailers through aratdars. Retailers sell the entire fish



to ultimate consumers. Paiker of tilapia fish purchases 92% from farmers through aratdar and 8% directly from farmers. Retailer purchases 89 % from farmers through aratdar and 11% from farmers. Consumer purchases 100% of tilapia from the retailers in the study area (Table 2). Table 2. Percent of tilapia fish transacted by value chain actors | | Purchase from (%) | Sold to (%) | | Value chain actor| | | Farmer | | Paiker | 8 | 92 | | | Farmer | | Paiker | 8 | 92 | | Value chain actor| Farmer | | Paiker | 11 | 89 | | | Farmer | | Paiker | 50 | 50 | | | Fisher men | | Faria | 100 | - | - | - | - | | Retailer | - | | | Farmer | Faria | Farmer via Aratdar| Bepari | Depot owner | AC Holder | Retailer | | Faria | 100 | - | - | - | - | - | | Depot owner | 40 | 20 | 40 | - | - | - | - | | Paiker | - | - | 100 | - | - | - | - | | Bepari | - | - | 100 | - | - | - | - | | A/C Holder | 30 | - | - | 50 | 20 | - | - | | Processing plant | - | - | - | - | - | - | - | | Retailer | - | - | 20 | 80 | - | - | - | | Consumer | - | - | - | - | - | - | 100 | Source: Field survey, 2010. Table 7. Percent of shrimp/prawn transacted by value chain actors (Cont.... | | Sold to (%) | | Value chain | Faria | Retailer via Aratdar | | actor | | | Rohu | Weight | Large: 2. 5 kg above, Medium: 1. 0 kg to 2. 5 kg, Small: Less than 1 kg | | Catla | Weight | Large: 3. 0 kg above, Medium: 1. 5 kg to 3 kg, Small: Less than 1. 5 kg | | Tilapia | Weight | Large: 300 gm above, Medium: 150 gm to 300 gm, Small: Less than 150 gm | | Pangas | Weight | Large: 1. 5 kg above, Medium: 1 kg to 1. kg, Small: Less than 1 kg | | Shrimp | Weight | Golda: U-5, 6/8, 8/12, 13/15, 16/20, 21/25, 26/30 | | | Bagda: 8/12, 13/15, 16/20, 21/25, 26/30, 31/40, 41/50 | | Hilsha | Weight | Large: Above 1 kg, Medium: 800gm to 1000 gm, Small: Less than 800 gm | | | Location | Catching from river, Catching from sea | Source: Field survey, 2010. 4. 13 Storage The storage facilities help buyers and sellers to reduce the wide fluctuation of prices between peak and

lean seasons. The storage function is primarily concerned with making goods available at the desired time and enables traders to receive better prices for their products. Because of high perishability, fish requires extremely specialized storage facilities matching the seasonal demand.

Only the processing plants in the shrimp industry use proper storage systems for export to the world market. Other intermediaries use only ice to transport fishes from one place to another. Surprisingly, no refrigerated vans are used in Bangladesh to transport fish. Live pangas is transported from one place to another using water in the plastic drums. If the distance is long, water is then changed twice or thrice depending on the distance. Though all intermediaries use ice during marketing, their use of ice in fish is not scientific for which quality of fish gets affected. While retail selling, some use ice and some do not. 4. 14 Transportation

Transportation is a basic function of making goods available at proper place and it creates place utility. Perishable goods must be moved as early as possible from the producing centre Figure 1. Mode of transport used by farmers and intermediaries for movement of major carps, pangas and tilapia Source: Field survey, 2010. Figure 2. Mode of transport used by farmers and intermediaries for movement of shrimp Source: Field survey, 2010. to the consumer centre. So transportation is essential for highly perishable commodities like fish. Adequate and efficient transportation is a cornerstone for the modern marketing system (Kohls and Uhl, 2005, p. 319).

In the study areas, the fish farmers and intermediaries use various modes of transports such as van, rickshaw, truck, passenger bus, pickup, Nasimon

(locally made pick-up type van for transporting passengers and goods), head load etc, to transfer product from the producing areas to the consumption centre. Figures 1, 2 and 3 show different modes of transport used by the intermediaries to transport fish from one place to another. 4. 15 Financing The financing function is the advancing of money by someone to carry on the business. For effective operation, financing is of crucial importance in the whole marketing system of fish. The source of finance for the value chain actors in the study areas are shown in Tables 8, 9 and 10.

Table 8 shows that most of the fish farmers, aratdars, paikers and retailers of major carps, pangas and tilapia are self-financed. Other sources of finance for farmers are banks, friends and relatives, and dadon. A minor portion of Aratdar's sources of finance are banks and friends and relatives. Paikers take loan from banks, NGO and friends and relatives. In addition to the use of their own fund, retailers also borrow from NGOs and friends and relatives.

Figure 3. Mode of transport used by the farmers and intermediaries for movement of hilsha fish Source: Field survey, 2010.

Table 8. Sources of finance of major carps, pangas and tilapia fish farmers and intermediaries

Sources of finance	Farmer	Aratdar	Paiker	Retailer
Own fund	86	96	82	76
Bank	9	3	11	0
NGO	0	0	5	16
Friend and relatives	4	1	2	8
Dadon from Aratdar	1	0	0	0
Total	100	100	100	100

Source: Field survey, 2010.

Table 9 shows that most of the fish aratdar, bepari, paiker and retailer of hilsha are self-financed. Other sources of their finance are banks, NGOs, friends and relatives and dadon. It is worth mentioning that finance of hilsha

fishermen come totally from aratdar/mahajon (who provides dadan). This dadon of the aratdars /mohajans makes fishermen very vulnerable as it is tied up with conditions. Fishermen receiving dadon from aratdars/mohajans are bound to sell their produce to them, sometimes at predetermined prices which in most cases are lower than the prevailing market prices. Moreover, they also deprive the fishers while weighing the produce. About one-fourth of the LC paikers business is run by bank loans. Table 9.

Sources of finance of hilsha fish farmers and intermediaries | Sources of finance | Market participants (%) | | | Fishermen | Aratdar | Bepari | Paiker | LC Paiker | Retailer | | Own fund | 3 | 90 | 95 | 80 | 74 | 99 | | Bank | 0 | 9 | 5 | 10 | 24 | 0 | | NGO | 0 | 0 | | 0 | 2 | 1 | | Friend and relatives | 0 | 1 | | 0 | | | Dadon from Aratdar | 97 | | | 10 | | | Total | 100 | 100 | | | 100 | 100 | Source:

Field survey, 2010. Table 10 shows that in the case of shrimp, most of the farmers, aratdar, bepari and retailers are self-financed. Depot owners use a combination of own funds, bank loans, NGO and aratdars for shrimp marketing. Only 20% of depot owners procure loans from banks while 5% and 3% received from NGOs and dadon giving aratdars respectively. However, a majority of depot owners use their own fund for the business. 34% of the paikers take dadon Table 10.

Sources of finance of shrimp farmers and intermediaries | Sources of finance | Market participants (%) | | | Farmer | | | Farmer | Depot owner | Aratdar | | Basket | Bamboo, Rope and Polythene | 40 kg | Farmer, Paiker and Retailer | | | 20 kg | Retailer | | Drum | Plastic | 40 kg | Farmer, Paiker | | | 20 kg | Retailer | | Crate | Plastic, Polythene | 40 kg | Depot owner (shrimp), Paiker,

Bepari, Account holder | | | | (Shrimp), Retailer | | Steel box | Steel sheet |  
250 kg | Paiker, Bepari (hilsha) | | Wooden box | Wood, Polythene | 160 kg |  
Bepari, Paiker, LC paiker (hilsa) | | Box | Cork sheet | 40 and 20 kg | LC Paiker  
(hilsha), Account holder, Processing p