Government of the Peoples Republic of Bangladesh
Flood Action Plan

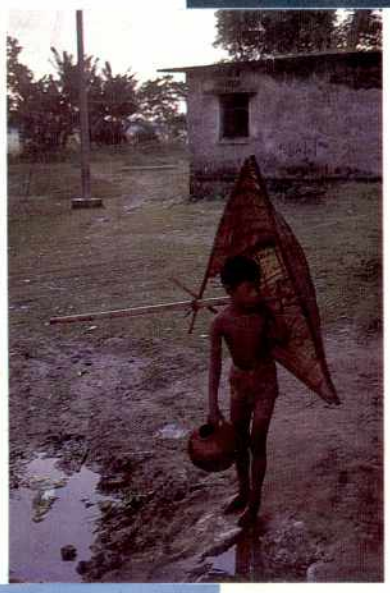
FAP 17

Fisheries Studies and Pilot Project

FINAL REPORT

(Draft)

JUNE 1994



Special study

Supporting Volume No. 20

FISH MARKETING AND PRICES

ODA
Overseas Development Administration, U.K.

FAP 17

FINAL REPORT

Special Study

FISH MARKETING AND PRICES

** Draft **

FAP 17
FISHERIES STUDIES
AND PILOT PROJECT

June, 1994

Funded by ODA in conjunction with the Government of Bangladesh

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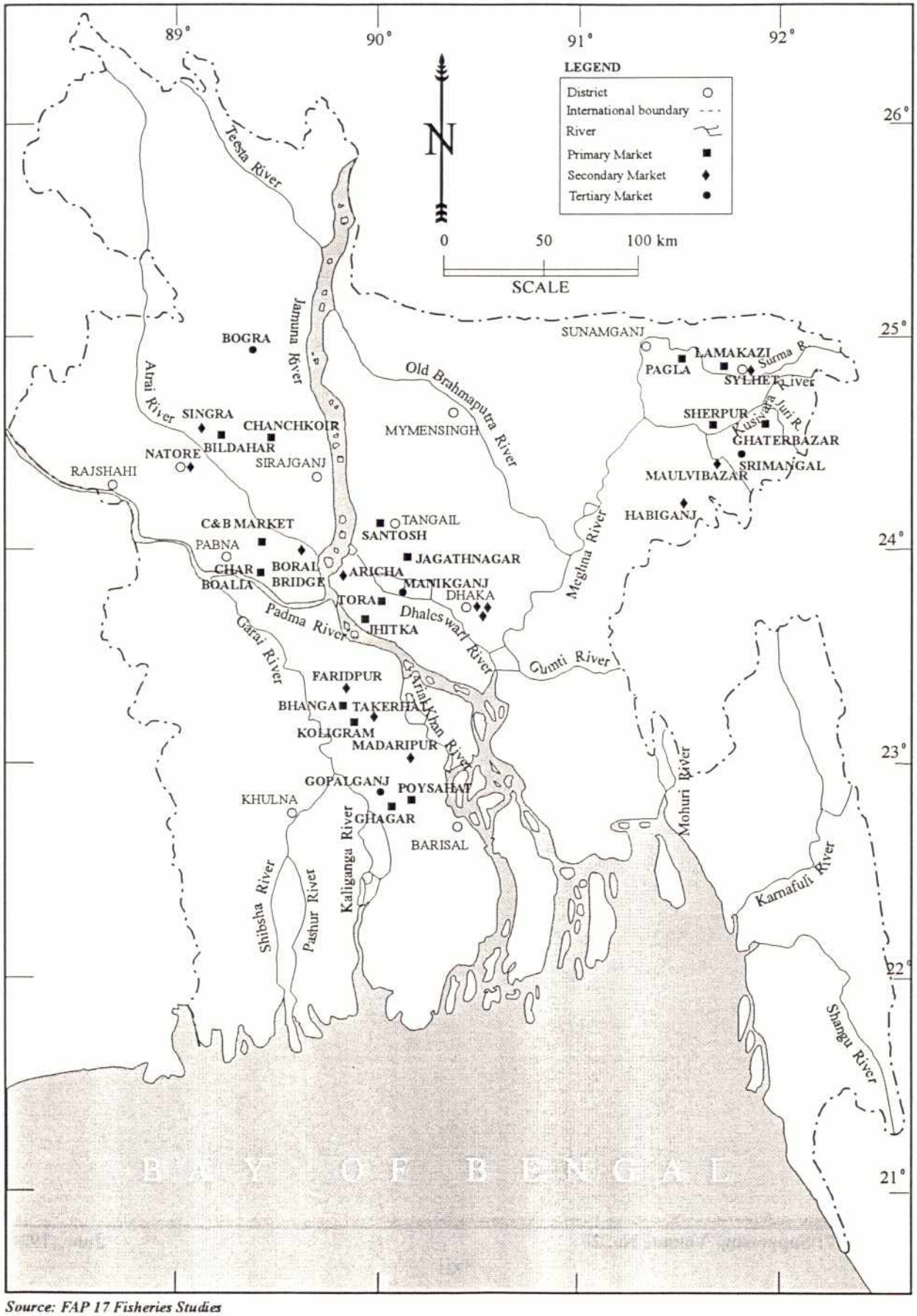
ACRONYMS AND ABBREVIATIONS

BAFRU	Bangladesh Aquaculture and Fisheries Resource Unit (ODA-financed project)
BARC	Bangladesh Agriculture Research Council
BFRSS	Bangladesh Fisheries Resource Survey System
BBS	Bangladesh Bureau of Statistics
BCAS	Bangladesh Centre for Advanced Studies
BFDC	Bangladesh Fisheries Development Corporation
BJMSS	Bangladesh Jatiya Matsajibi Samabaya Samity (National Fishermen's Co-operative Organisation)
BOBP	Bay of Bengal Programme
DAM	Department of Agricultural Marketing (Ministry of Agriculture)
DoF	Department of Fisheries (Ministry of Fisheries and Livestock)
FAO	Food and Agricultural Organisation of the United Nations
FAP 6	Bangladesh Flood Action Plan - Study No. 6 (North East Regional Water Management Project)
FAP 12	Bangladesh Flood Action Plan - Study No. 12 (FCD/I Agricultural Study)
FAP 17	Bangladesh Flood Action Plan - Study No. 17 (Fisheries Studies and Pilot Project)
FCD	Flood Control and Drainage
FCD/I	Flood Control and Drainage with or without Irrigation
FFYP	Fourth Five Year Plan
FPCO	Flood Plan Coordination Organisation
FY	Fiscal year
GoB	Government of Bangladesh
GDP	Gross Domestic Product
Ha	Hectare
IFPRI	International Food Policy Research Institute
IMC	Intensity of market connectedness
Kg	Kilogram
Km	Kilometre
MFL	Ministry of Fisheries and Livestock
MIWDFC	Ministry of Irrigation, Water Development and Flood Control
MPO	Master Plan Organisation
mt	Metric tonne

NGO	Nongovernmental Organisation
NFMP	New Fisheries Management Policy
NMM	Net marketing margin
ODA	Overseas Development Administration
ODNRI	Overseas Development Natural Resources Institute
TFYP	Third Five Year Plan
Tk.	Taka (currency unit in Bangladesh)
UNDP	United Nations Development Programme
WB	World Bank

FRONTISPIECE

Location of Sample Fish Markets



Source: FAP 17 Fisheries Studies

SUMMARY

(1) Wide seasonal fluctuations in fish supply are a common phenomenon that is linked to the main harvest of market-dominant species. During peak *beel* harvests and major pond harvests the fish supply increases and trade volume rises with it. During the lean period the volume per trader is significantly reduced.

(2) As the population of Bangladesh continues to rise, the fish marketing system will be required to handle larger volumes of fish. Moreover, there are indications that urban fish consumption is growing faster than rural consumption. If this trend continues, more fish will have to be moved from surplus production areas to urban consumption centres.

(3) The existing fish marketing system is reasonably efficient, but improved distributional infrastructure and support services could improve efficiency.

(4) There are insufficient supplies of ice throughout the inland fish marketing system. Although some public sector ice plants have unused capacities, remote production zones suffer from ice shortages due to the uneven geographical distribution of plants and an inadequate communication system.

(5) Fishermen and traders are unknowledgeable about the optimum level of ice use for fish preservation. Traders typically apply only about one-third of the desirable amount of ice.

(6) Road and water transport dominate the long-distance shipping of fish. Slow-moving modes of transportation, such as country boats, push carts and rickshaw van, are extensively used for short distances. Regardless of the mode of transportation, however, there are no insulation and refrigeration facilities.

(7) Marketing agents act within a framework governed by links of patronage, kinship and credit. *Mahajan* and *aratdar* are the chief providers of much-needed financing for small traders and poor fishermen.

(8) Fish traders largely depend on their own resources for working capital. Even *aratdar*'s dependence on credit for working capital is small. The risky nature and low returns of the fish trade do not generate the confidence needed to access institutional credit.

(9) The trade margins earned by fish traders do not appear to be excessive, and rates of return to capital seem modest despite the existence of considerable variation both among traders and across regions.

(10) Retail prices for fish have sharply risen over the period 1975-92, while producers' prices have virtually stagnated. Wholesale prices have also risen, but at a lesser rate than retail prices.

(11) Fish markets are well connected—at least for the major traded species and across major centres.

(12) Flood control measures may have some negative impacts on the fish trade by reducing fish stocks, but other factors may have simultaneously contributed to these changes.

INTRODUCTION

The Fish Marketing and Prices study is one of the socioeconomic components of the Fisheries Studies and Pilot Project (FAP 17). FAP 17 is funded by the British Overseas Development Administration (ODA) in conjunction with the government of Bangladesh (GoB). The national implementing agency for the Fisheries Studies is the Department of Fisheries (DoF) of the Ministry of Fisheries and Livestock (MFL). FAP 17 also reports to the Flood Plan Coordination Organisation (FPCO) of the Ministry of Irrigation, Water Development and Flood Control (MIWDFC).

Fisheries are an important part of the Bangladesh economy, accounting for 5% of the country's GDP and about 10% of its export earnings. In 1989-90 the value of the nation's fish and fish products was Tk.4,780 million. Fishing is also a major source of employment; about 1.2 million people engage in fishing, and in rural areas fishing is second only to agriculture in providing employment. The nation's diet, too, is highly dependent on fish, which is the main source of animal protein for the people of Bangladesh.

Understanding the operation and economics of the system through which fish are marketed, therefore, is essential to gauging the social and economic impacts flood control interventions proposed under the Flood Action Plan (FAP) may have on fish production.

1.1 Study Objectives

This study originally was intended to provide a detailed understanding of the freshwater fish marketing system of the Bangladesh floodplains. To do so would have required a thorough investigation of the flow of fisheries products through the system, from producers to consumers, as well as a study of the interrelationships among the system's participants. It also would have necessitated regular monitoring of the changes in key marketing system variables over the course of a year. As work on the village studies, the main component of the socioeconomic portion of FAP 17, progressed and field team workloads were objectively assessed, however, it became apparent that personnel resources were insufficient to carry out both studies as originally outlined. Since the marketing study was more peripheral it was scaled back, and its objectives were revised. As defined in the FAP 17 Interim Report, these objectives are:

- to provide a bibliographical review of research on fish marketing;

- to conduct a study of costs and returns to agents in the marketing system;
- to study market integration using available secondary data sets; and
- to investigate long-term trends in fish prices.

In addition, this report describes the freshwater fish marketing system and offers an assessment of the impacts flood control interventions have had on the fish trade, specifically assessments by traders who have felt their effects.

1.2 Background: Fish Production, Distribution and Consumption

1.2.1 Fish Production

Fish production in Bangladesh has both marine and inland components, but the marine fisheries contribute little to the domestic fish supply. The country's total inland fish production is among the highest in the world, ranking third behind China and India (WB 1983).

Fish production and consumption data for Bangladesh are scarce, and the quality of what does exist is uneven. According to BBS data based on information provided by the Directorate of Fisheries (BBS 1990), total fish production from 1972-73 to 1974-75 was between 818 and 822 thousand metric tons and from 1975-76 to 1980-81 it ranged from 640,000 to 650,000 mt. During the latter period, moreover, marine fisheries production was rising while that of inland fisheries was decreasing. A sharp fall in inland fisheries production occurred between 1975-76, when it was 733,000 mt, and 1980-81, when it was only 525,000 mt. Total production started rising again in 1982-83, and reached 815,000 mt in 1986-87.

Table 1.1 shows fish production and exports under the Bangladesh government's Third Five-Year Plan (TFYP) and Fourth Five Year Plan (FFYP). In each case the figures are those for the terminal year of the plan; for the Third Five Year Plan (TFYP) they are actual numbers, for the Fourth Five Year Plan (FFYP) they are targets. The data indicate that since 1986-87 inland fish production has continued its growth trend and is projected to reach 938,000 mt by 1994-95.

Table 1.1 **Fish Production and Exports under the TFYP and FFYP**

	Quantity ('000 metric tons)	
	TFYP (1989 - 90)	**FFYP (1994 -95)**
Preduction		
Inland Fisheries	627.05	938
Marine Fisheries	239.06	262
Total		
Export		
Shrimp	17.54	45
Fish & Fish Products	5.14	17
Frog Legs	0.73	2
Total	23.41	64

Source: DoF statistics; BBS; Fourth Five Year Plan

1.2.2 Fish Consumption

According to National Nutrition Survey estimates, average fish consumption in 1962-64 was 27.7 gm/person/day, but by 1975-76 it had dropped to 22.3 gm/person/day. Multiplying the latter figure by a population of 78 million over 365 days yields a total consumption of 634,881 mt, which is close to the BBS figure for 1975-76, thus supporting the inference that fish consumption decreased between 1962-64 and 1975-76.

More recent National Nutrition Survey estimates found that average fish consumption was 23 gm/person/day in 1981 and 20.13 gm/person/day in 1989. There is no statistical evidence of a significant change in fish consumption since 1975-76.

1.2.3 Fish Distribution

Only about 5% of the fish harvest is consumed by those who catch it. The rest reaches consumers via retailers, other market intermediaries or directly from the fishermen.[1] The proportion attributed to each is shown in Figure 1.1.

[1] In this report the term "fisherman" is used in its most general sense, including both those who catch fish and those who produce fish through pisciculture.

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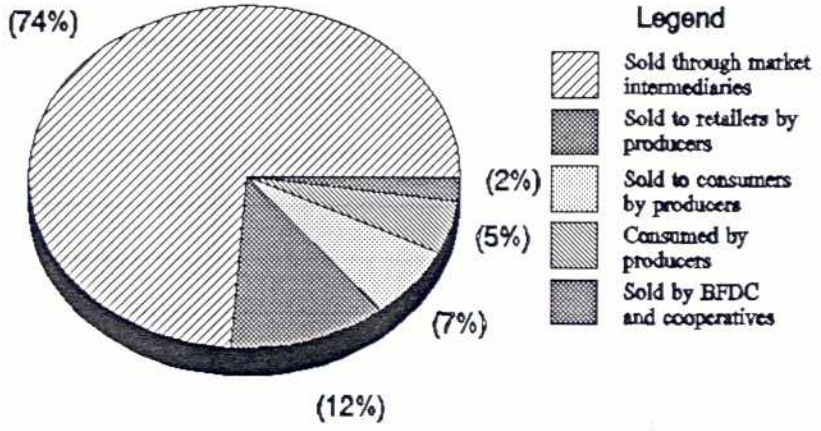
Figure 1.1 Distribution of Fish Harvest through Market Channels



Source: Rapport Bangladesh Ltd.

As the figure indicates, most fish is sold through market intermediaries. These intermediaries actually constitute a chain of four distinct market connections: from catch sites to primary markets (landing places); from primary markets to secondary markets (wholesale/assembly markets); from secondary markets to higher secondary markets (urban wholesale markets); from secondary and higher secondary markets to tertiary markets (retail markets).[2] These channels are not rigidly followed, however, and part of the harvest goes directly from fishermen to *arat* and retailers and some goes straight from fishermen to consumers. A diagrammatic representation of fish marketing channels appears in Figure 1.2.[3]

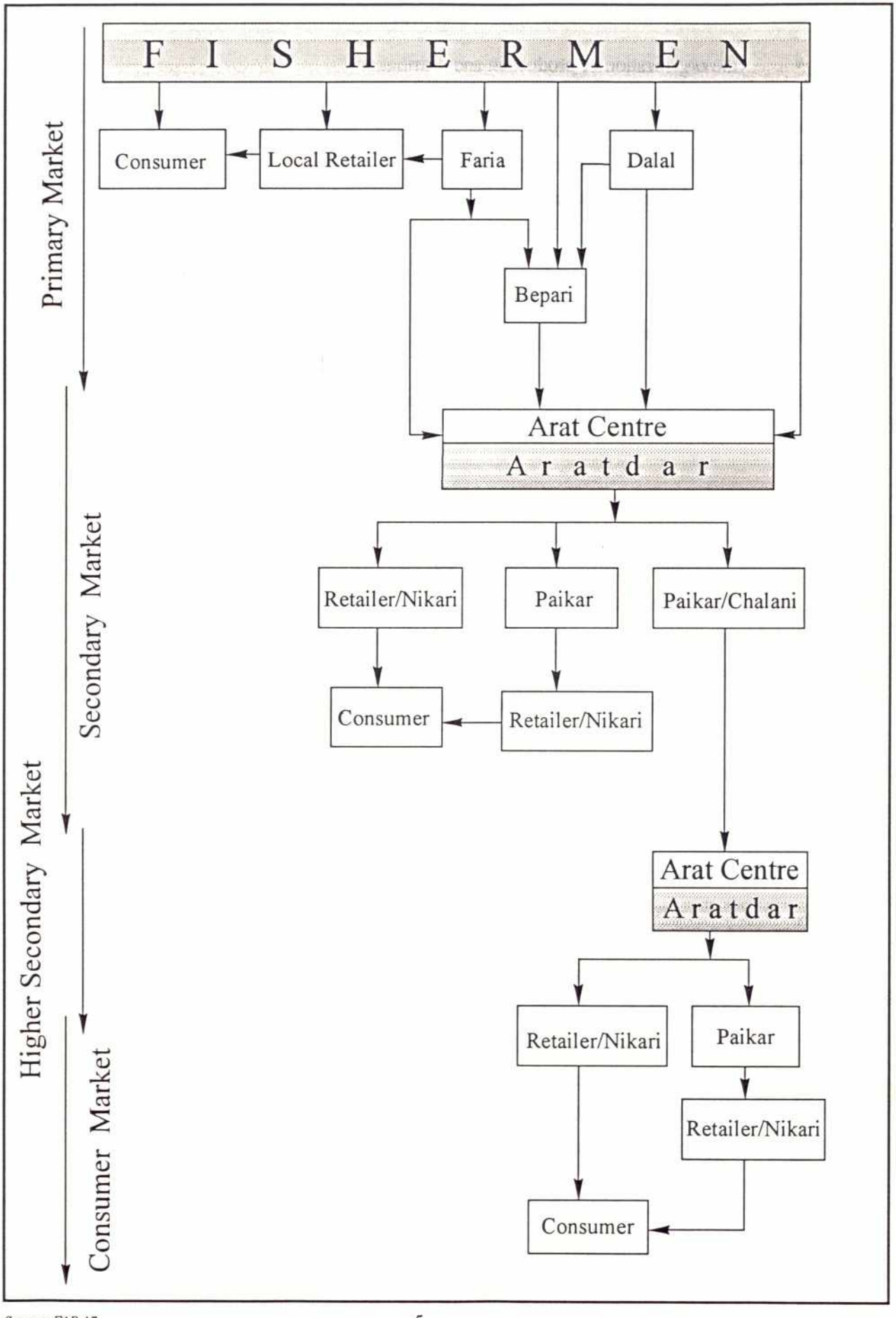
1.3 Study Approach

Any investigation of the inland fish marketing system in Bangladesh must carefully consider issues relating to production, distribution patterns and the functioning of the marketing network. Understanding the relationship between fishermen and market intermediaries, the terms of trade, links to patronage, credit mechanisms and the benefits market participants derive can assist in assessing the socioeconomic impacts of flood control on fish production and distribution.

[2] The definitions of primary, secondary and tertiary markets can be found in Section 2.2.3.

[3] Chapter 5 explains in detail the role of each market intermediary.

Figure 1. 2 Fish Marketing Channels



Source: FAP 17

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This study examines:

- the organization of production and distribution;
- marketing channels, their participants and their relationships;
- the availability of distributional infrastructure and its constraints;
- price trends and market integration; and
- trade finance and return to capital.

1.4 Methodology

1.4.1 Information Sources

The Fish Marketing and Prices study uses both primary source data and secondary sources of information.

The primary source data consists of information collected through a survey of sample fish markets and monitoring of fish trading households. Price data collected by the Market Survey provided producers' prices. Detailed information on cost components and returns to capital were collected from primary sources by intensive interviews of "key informants" in selected primary, secondary and tertiary markets. The Village Monitoring Surveys collected detailed information on the role of fish marketing in the livelihood strategies of the sampled fish trading households. Monthly prices of major species (Appendix B) were collected from the sample primary markets by regional socioeconomic survey teams.

Secondary sources were used to gather information on production trends, trade flows, credit provisions and marketing institutions. The study also used monthly price data for important wholesale markets that is available from the Directorate of Agricultural Marketing (DAM). Monthly price data on major fish species were collected from DAM for the period from July 1983 to June 1992. Major sources of secondary information are:

- Department of Fisheries (DoF)
- Bangladesh Bureau of Statistics (BBS publications)
- Directorate of Agricultural Marketing
- Master Plan Organisation (technical reports)
- Reports from FAP 6 and FAP 12
- Rapport Bangladesh Ltd.

1.4.2 Bibliographical Review

Based on a bibliographical review of major research works on fish marketing, a working paper was prepared. The purpose of this review was to sketch an overview of fish marketing in Bangladesh and identify major issues (see Chapter 2). This information was then used to assist in the development of an appropriate study methodology.

1.4.3 Collection of Market Survey Data

1.4.3.1 Study Areas

The study area is all of Bangladesh. For the convenience of cross-referencing the marketing study with the main socioeconomic study, the same four regional divisions of the country are used: North Central, North East, North West and South West.

1.4.3.2 Selection of Sample Markets

The criteria for the selection of sample primary markets were: location near socioeconomic study sample villages and proximity to fisheries sites. Secondary markets were selected on the basis of their links to Dhaka markets and sample primary markets.

The original plan called for the selection of eight sample markets from each of the four regions—four primary markets, three secondary markets and one tertiary market. This plan was adhered to in all but the North Central Region where there was an insufficient number of secondary markets that satisfied the selection criteria. Because of the proximity of Dhaka, fish from sample primary markets in this region are sent directly to Dhaka wholesale markets. In view of this, three major wholesale markets in Dhaka were included in the survey.

Table 1.2 lists the selected sample markets and Table 1.3 shows the location of primary markets relative to FAP 17 study villages and fisheries sites.

1.4.3.3 Preparation of Survey Questionnaires and Field Testing

Once the sample sites were selected, a set of questionnaires was developed (Appendix C) to collect the required information through field surveys. The questionnaires were designed by the Lead Researcher under the guidance of the study's Natural Resources Economist. The

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Table 1.2 Sample Fish Markets by Region

Market Name	Market Type*	Union	Thana	District
NORTH CENTRAL REGION				
Jhitka	P	Gala	Harirampur	Manikganj
Tora Ghat	P	Dighi	Manikganj	Manikganj
Jagathnagar	P	Saturia	Saturia	Manikganj
Santosh	P	M. ward No. 1	Tangail	Tangail
Aricha	S	Shibalaya	Shibalaya	Manikganj
Manikganj	T	M. ward No. 1	Manikganj	Manikganj
NORTH WEST REGION				
Karanja C&B Market	P	Karanja	Santhia	Pabna
Char Boalia	P	Ahmedpur	Sujanagar	Pabna
Bildahar	P	Chamari	Singra	Natore
Chanchkoir	P	M. ward No. 2	Gurudaspur	Natore
Singra Fish Arat	S	Singra	Singra	Natore
Natore	S	M. ward No. 1	Natore	Natore
Boral Bridge	S	Bhangura	Bhangura	Pabna
Bogra (Rajabazar)	T	M. ward No. 2	Bogra	Bogra
NORTH EAST REGION				
Ghater Bazar	P	Buk shimul	Kulaura	Moulvibazar
Sherpur	P	Khalilpur	Moulvibazar	Moulvibazar
Paglabazar	P	Paschimpagla	Sunamganj	Sunamganj
Lamakazi	P	Lamakazi	Biswanath	Sylhet
Moulvibazar	S	M. ward No. 3	Moulvibazar	Moulvibazar
Sylhet (Kazibazar)	S	M. ward No. 2	Sylhet	Sylhet
Habiganj	S	M. ward No. 1	Habiganj	Habiganj
Srimangal	T	M. ward No. 1	Srimangal	Moulvibazar
SOUTH WEST REGION				
Ghagar	P	Ghagar	Kotalipara	Gopalganj
Poysar Hat	P	Bakal	Agailjhara	Barisal
Bhanga	P	Bhanga	Bhanga	Faridpur
Koligram	P	Jalirpar	Muksedpur	Gopalganj
Taker Hat	S	Khalia	Rajoir	Madaripur
Madaripur	S	M. ward No. 2	Madaripur	Madaripur
Faridpur	S	M. ward No. 1	Faridpur	Faridpur
Gopalganj	T	M. ward No. 1	Gopalganj	Gopalganj
DHAKA				
Swarighat wholesale mkt.	S	M. ward No. 66	Lalbagh	Dhaka City
Kawranbazar wholesale mkt.	S	M. ward No. 39	Tejgaon	Dhaka City
Kamalapur wholesale mkt.	S	M. ward No. 31	Motijeel	Dhaka City

* P = Primary Market; S = Secondary Market; T = Tertiary Market

Table 1.3 Location of Sample Primary Fish Markets

Market Name	Union	Thana	Nearest Study Village		Nearest Fisheries Site
			Target Village	Fishing Community	
NORTH CENTRAL					
Jhitka	Gala	Harirampur	a. Jhikutia b. Durgapur	Kutirhat Ujanpara Gopalpur Diapara	Ichamati River
Toraghat	Dighi	Manikganj	Ashapur	Zabra	Kaliganga River
Jagathnagar	Saturia	Saturia	Jagannathpur	Bhatara Duimukha	Gazikhali River Hazipur Floodplain/Beel
Santosh	M. ward No. 1	Tangail Sadar	-	-	Santosh Khal Lauhajang River Atia Beel
NORTH WEST					
Karanja (C&B)	Karanja	Santhia	Phechuan	Talot Sonatola	Roadside khal
Char Boalia	Ahmedpur	Sujanagar	Boalia	Ahmedpur	Gandahasti Floodplain Gajna beel
Bildahar	Chamari	Singra	Krishnanagar	Bildahar	Atrai River Chalan Beel
Chanchkoir	M. ward No. 2	Gurudaspur	Durgapur	Jagendranagar	Atrai River Haribanga Beel
NORTH EAST					
Ghater Bazar	Buk Shimul	Kulaura	Nischintapur	Shahpur Shadipur	Gobindapur Floodplain
Sherpur	Khalilpur	Moulvibazar	Mirpur	Kadipur Goygor	Khoradari Khal Patasinga Beel
Pagla Bazar	Paschim-Pagla	Sunamganj	Mahmudpur	Chandpur Enaetnagar	Mouti Beel
Lamakazi	Lamakazi	Biswanath	Akhterpara	Horinagar	Dhapa Floodplain
SOUTH WEST					
Ghagar	Ghagar	Kotalipara	Gachapara	Uttarpara-Bagan	Chitrapara Floodplain Chitrapara Beel
Poysar Hat	Bakal	Agailjhara	Gopalsen	Poysa Chand Trisira	Satla Bagda Khal
Bhanga	Bhanga	Bhanga	Kafurpur	Shoraibari	Kumardanga Floodplain
Koligram	Jalirpar	Muksedpur	Pathankhandi	Kutibari	Mohipaul Floodplain

questionnaires were then tested in markets that had not been selected for the survey in order to judge their relevancy, consistency and the time required to complete them. The questionnaires were then modified on the basis of the pre-test results.

1.4.3.4 Selection of Key Informants

Key informants were then selected and interviewed at three major wholesale markets. The informants included presidents and secretaries of trade and market associations, leading *aratdar* and other market intermediaries. During this exercise, traders supplying fish to Dhaka wholesale markets were interviewed to identify major link markets.

Key informants for each sample market were identified during visits to the market. Informants were interviewed by administering a checklist to collect basic information on the market with which they were associated.

1.4.3.5 Selection of Respondents

Traders in wholesale fish markets, with the exception of *aratdar,* do not maintain offices in the market. It is therefore difficult to make any meaningful census of the types of traders operating in a market, so respondents were selected to ensure reasonable representation of various functions in the marketing chain.

The ideal composition of respondents in the primary markets was:

Fisherman	4
Faria	3
Aratdar	3
Nikari	2
Total	**12**

The ideal composition of respondents in secondary and tertiary markets was:

Fisherman	3
Aratdar	3
Bepari	3
Nikari	3
Total	**12**

It was impossible to adhere strictly to these ideals, however, because fish market traders tend to move from market to market.

A total of 249 market intermediaries was interviewed comprising middleman traders (*faria, bepari, paikar* and *chalani*), *aratdar* and *nikari* (retailers). In addition, 103 respondents were interviewed from among the fishermen selling directly to the sample markets.

Information was also collected from 14 transport agencies and 46 ice factories located within 10 km of the sample markets.

1.4.3.6 Market Survey Procedures

A comprehensive, structured, multiple-visit survey of a large number of primary, secondary, and tertiary markets was beyond the resources of this study. The method used instead intensively interviewed key informants and selected respondents in the designated primary, secondary and tertiary markets during a single visit. The surveys were conducted between June 1993 and March 1994.

The subjects of the survey in each market were interviewed using the structured questionnaires. The interviews were conducted by the study's Research Assistant under the guidance and supervision of the Lead Researcher.

Information on prices, costs and transaction volumes was obtained from records such as vouchers, transaction registers and other records maintained by *aratdar* in each market. Information on quantities of fish traded, prices obtained and costs incurred for trading activities during the preceding peak and lean periods relied on the memories of those interviewed. Information on market characteristics and infrastructure was collected through field observation and by interviews of key informants in each market. The Research Assistant also collected retrospective price data for six months for 16 groups of fish species generally traded in the market. Monthly prices of major species (Appendix B) in the sample primary markets were monitored by the regional socioeconomic survey teams.

1.4.3.7 Field Supervision and Quality Control

The Lead Researcher was responsible for Market Survey operations, and provided necessary expertise and counsel through frequent visits to the field. He also scrutinised the completed

forms and edited them, where necessary, to prevent misinterpretation of terms and concepts by the Research Assistant and to address other deficiencies.

1.4.4 Data Entry and Analysis

All survey data were entered into a database, which was used to tabulate the information collected. The Lead Researcher interpreted and analyzed the tabulated data for the preparation of a survey report under the guidance of the study's Natural Resource Economist.

1.4.5 Estimation of Return to Capital

The fish marketing chain can be divided into two segments for marketing margin analysis. They are: primary markets to secondary markets and secondary markets to higher secondary markets (urban wholesale markets). The measure of return to capital used for each segment is net marketing margin (NMM). NMM is the difference between the sale price and the marketing costs. A full cost method was used to compute NMM.

The data set is based on all costs involved in the process of buying and selling (including utility charges, labour costs, icing, packaging, transport, market charges, *aratdar*'s commission, etc.), the prices received and volumes transacted during the course of one trading day.

1.4.6 Determination of Price Trends

Several sets of prices were used in this study to analyze price trends for major fish species. The Directorate of Agricultural Marketing (DAM) collects major species price data for a large number of wholesale centres across the country. In addition, the Bangladesh Bureau of Statistics (BBS) publishes monthly retail price data for the major species for seven important centres. A third data set, available from the Department of Fisheries (DoF), is the producers' price.

Nominal wholesale prices (DAM) were deflated by the Consumer Price Index for Middle Income Families in Dhaka, published by the BBS. Retail prices (BBS) were converted into real prices by deflating them with the Wholesale Price Index (Agriculture) and then deseasonalized.

1.4.7 Market Integration Study

Market integration for a system of regional markets is determined by the degree of correlation among price changes across the markets over time and space. To test market integration in Bangladesh, this study prepared price correlation matrices for pairs of markets using average seasonal prices. Average seasonal prices of major fish species in secondary markets (district level) and Dhaka wholesale markets were calculated from monthly price data collected from DAM.

In the investigation of fish market integration, this study used the Ravallion model along with modifications proposed by Timmer and Heytens; the model and modifications are discussed in detail in Chapter 7.

1.5 Report Outline

The Fish Marketing and Prices report presents the analytical results of the study and the findings of the Market Survey in nine chapters. The chapters are listed below.

1. Introduction, objectives and methodological approaches.
2. Review of the existing research to identify the major issues involved in the fish marketing system.
3. Description of the organisation of fish production and distribution, focusing on production trends, product composition, supply sources, and the evolution of market channels, market tiers and trade specialisation.
4. Description of the status of the distribution infrastructure and impediments to market efficiency.
5. Examination of the role of marketing agents, their interrelationships, social connections and patronage, as well as their links with producers.
6. Enumeration of the working capital of market intermediaries, identifying its source and the types of credit used. Returns to capital for traders at various market tiers also are estimated.
7. Analysis of price trends and market performance to determine the degree to which fish markets are integrated.
8. Assessment of FCD impacts on fish availability and trade volume, as well as present traders' assessments of FCD impacts on trade.
9. Present the conclusions drawn from the study findings and make policy recommendations.

LITERATURE REVIEW

The existing literature on freshwater fish marketing in Bangladesh describes the functioning of the system and identifies the major issues that affect the efficiency of the domestic fish trade. This chapter summarizes the research that has been done in the past.

2.1 The Fish Marketing System

Food marketing can be defined as the process by which food reaches consumers in the form and at the time and place they desire. Before a commodity is delivered to its consumers, ownership of it is transferred through a series of intermediaries. Each intermediary adds value to the product and benefits accrue to those involved in its enhancement. The physical activities involved in the fish marketing system include collecting fish from fishing grounds and transporting them to an entry point in the marketing system, cleaning, sorting, icing, preserving, transporting, curing, storing, and, ultimately, delivering them to consumers.

The major participants in the fish marketing system are:

- producers (fishermen/pond owners);
- intermediary traders (*aratdar, faria, bepari* and *chalani*);
- fish handlers and transporters;
- moneylenders who finance these activities (*mahajan* and *aratdar*);
- retail traders (*nikari*); and
- consumers.

Fishing activities in Bangladesh traditionally are small-scale household enterprises. Ahmed (1983) found that small-scale operators account for about 95% of the country's total catch and about 99% of fishermen. The marketing system, through its several tiers of intermediaries, establishes an essential link between these production units and the market economy. This system is almost entirely operated by the private sector; it is managed, financed, and controlled by *mahajan* (moneylenders) and *aratdar* (commission agents). *Mahajan* and fish traders finance fishermen and control their fishing activities. Groups of *aratdar* run wholesale fish markets and advance money to traders, who are thereby obligated to sell fish to them. *Aratdar* may also directly finance fishermen.

The structure of this system prevents many small producers and fishermen from selling their fish through open bargaining because of their economic ties with *mahajan*, *faria* (petty traders) or *bepari* (assemblers/wholesalers). If a fisherman takes a *dadan* (a loan in the form of an advance purchase) from a *mahajan* or trader he is then compelled to deliver his catch to that intermediary at a set price. *Dalal* (brokers) also play an important role in the process of collecting fish from the fishing grounds for traders.

Fish is one of the most perishable of all staple commodities; unless processed or preserved, most becomes unfit for human consumption a day after capture. Some fish (*koi*, *magur* and *singi*) stored in a container with sufficient water can survive several days, but transporting live fish over long distances is difficult. In the absence of processing and preservation facilities small producers are compelled to dispose of their catch as quickly as possible, and when there is a glut of fish, they may sell their catch at drastically reduced prices.

Water, road and rail transport are all used to carry fish over longer distances from collection points to markets and between markets. Overland shipment is done mainly by road transport because it is more flexible, safer and faster than the railways.

2.2 Market Efficiency

There are two components to market efficiency: technical efficiency and economic efficiency. Technical efficiency is determined by the physical state of the processing and marketing infrastructure. Economic efficiency is determined by the degree of competition, marketing margins, freedom of entry into the marketing system, and other factors. While they are discussed separately below, the two components are interdependent.

2.3 Technical Efficiency

Lack of marketing infrastructure, inadequate ice supplies, and the absence of modern handling and processing facilities all inhibit the technical efficiency of the fish marketing system in Bangladesh. On the whole, the fish marketing infrastructure in Bangladesh is inadequate, poor in quality and low in operational efficiency. Among the specific problems noted in the literature is that the existing fish preservation, handling and transportation system is unscientific and wasteful (Ahmed 1983). In addition, Rapport Bangladesh Ltd. (1986) found the distribution infrastructure and support services to be below the desired level.

The Bangladesh Fisheries Development Corporation (BFDC), a public sector agency established in 1964, seeks to enhance technical efficiency by providing landing centres and wholesale markets for private sector use. The BFDC facilities (discussed in Section 2.6) remain largely unutilized, however.

Landing Facilities and Wholesale Markets

Landing facilities and wholesale markets belong either to BFDC, municipal authorities or private individuals. In a few cases, intermediaries have formed associations to rent facilities.

Municipal and private landing facilities lack sufficient capacity, storage, icing and sanitation. In addition, riverbank fish landings become unapproachable during the dry season due to siltation, river erosion and low flows. During heavy rainfall or floods, some landing centres are partly or fully submerged (Rapport Bangladesh Ltd. 1986).

The distances between the southern wholesale markets (Cox's Bazaar, Chittagong, Barisal, Khulna and Chandpur) and their associated production areas range from 64 to 965 km. Most of the BFDC landing facilities (listed in Box 1) are in these coastal districts. The wholesale markets of the *baor* areas (Sylhet, Mymensingh, Kuliar Char and Mohonganj) are 80 to 322 km from their main fishing areas. In northern Bangladesh, where there is a wholesale market deficit, markets draw their supplies from distances ranging up to 1,110 km (Rapport Bangladesh Ltd. 1986).

Landing and Marketing Centre of Kaptai Reservoir Fishes, Rangamati
Fish Processing and Marketing Centre, Mongla
Fish Processing and Marketing Centre, Pagla
Fish Landing and Wholesale Fish Market, Cox's Bazaar
Fish Landing and Wholesale Fish Market, Khulna
Fish Landing and Wholesale Fish Market, Khepupara
Fish Landing and Wholesale Fish Market, Patharghata
Fish Landing and Wholesale Fish Market, Barisal
Fish Landing and Wholesale Fish Market, Rajshahi
Fish Landing and Wholesale Fish Market, Daborghat, Sunamganj

Box 1: BFDC Landing Facilities and Markets

Retail Market Facilities

Rapport Bangladesh Ltd. (1986) reported that the sales area, parking space, sanitation, ventilation, water supply and provisions for preservation at urban retail markets were unsatisfactory.

Urban retail markets usually are in tin sheds or brick sheds with tin roofs and concrete floors. Rural retail markets, on the other hand, are generally held in spaces open to the sun, which hastens fish deterioration.

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Delivery Delays

There is a considerable time lag between the harvest of fish and its delivery to consumers. This delay consists of waiting time and travel time. Waiting time is the time required to complete the handling and processing of fish and includes the time elapsed while the fish is waiting to be transported and the time the retailer takes to dispose of his merchandise. Travel time is the time it takes for fish and fish products to travel from producing areas to retailing points via wholesale markets.

Ahmed (1983) estimated that the average waiting time ranges from 4 to 17 hours and the average travel time ranges from 6 to 69 hours. The total average time lag therefore ranges from 10 to 86 hours.

Post-harvest Losses

Post-harvest losses can be quantitative or qualitative. Quantitative losses occur due to (a) excessive catch, (b) delay in distribution and marketing, (c) transportation breakdown, or (d) discarding of by-catch from mechanised marine fisheries. Qualitative losses are losses in commercial value and are due to spoilage and insect infestation. Spoilage is mainly a function of the time spent in marketing channels and lack of preservation by icing at the catch and assembly stages.

Bacterial and autolytic spoilage starts as soon as the fish dies, and damaged fish are particularly susceptible to bacterial spoilage (Ames, et al. 1991). Much of the fresh fish caught by small-scale fishermen is sold soon after landing. Physical damage to the fish is substantial, however, due to poor handling and carelessness during the harvest, at the landing and after landing.

Post-harvest fish losses in developing countries generally are quite high, but estimating these losses is difficult and information for Bangladesh is slight. A 10% loss for fresh fish is suggested in tropical countries. The physical loss for dried unsalted fish in Bangladesh is estimated to be between 25% and 30% (Ames, et al. 1991).

Ahmed (1983) estimated that losses amounted to 6% of the marine catch and 2% of the inland catch. A study by the Overseas Development Natural Resources Institute (Coulter & Disney 1987), updating Ahmed's estimate, arrived at an overall loss of 4.6% of the total landings destined for internal consumption. The study also observed that further research probably would reveal even higher losses.

Ice Supply and Cold Storage

Spoilage begins as soon as a fish dies, but ice keeps the process in check and is especially valuable for preserving fish (FAO 1968). Ahmed (1983) estimated the ideal fish to ice ratio for Bangladesh at 1:1.5 in the summer and 1:1 in the winter. He found, however, that the actual application of ice between fishing grounds and landing points averaged 1:0.68 in summer and 1:0.49 in winter. The unavailability of ice in many areas precluded its application to fish.

Ice production is concentrated in major landing and wholesale markets and in the coastal districts where shrimp culture is expanding. Rapport Bangladesh Ltd. (1986) found, however, that of 18 surveyed landings and markets only eight had adequate ice supplies. Inland fishing areas have few ice plants and the usual supply sources are ice cream factories. There clearly is shortage of ice, particularly at peak periods, which results in both quantitative and qualitative fish losses. During peak fishing periods in remote fishing areas, fish are kept in bamboo baskets without ice until a sizeable quantity is caught and transport is available.

Ice shortages during peak fishing periods are reflected in high prices for ice at those times. Price fluctuations could be reduced if there were an adequate number of insulated ice stores to hold stocks of ice to meet extraordinary demand. Such stores would also prevent ice from melting in the open air while waiting to be used.

Most cold storage facilities belong to the private sector and are mainly used for shrimp. Rapport Bangladesh Ltd. (1986) found that half of the available cold storage facilities were unutilized.

Fish Handling and Transport

Poor fish handling and transportation is one of the major problems affecting fish trade in Bangladesh. From a landing place in the southern part of the country it can take several days for fish to reach the northern districts. This long transport time, coupled with poor processing results in considerable spoilage loss.

Boats are the principal means of transporting fish from collection points to markets and between markets. For the most part, non-mechanised boats are used to collect fish from the fishing areas. These boats are slow, unsafe and uneconomical compared to mechanised boats. Passenger launches and steamers are used to move fish to wholesale markets and higher markets.

Trains, trucks and buses are used to transport fish over long land distances, but traders generally prefer to move fish by truck because it is faster and involves less wastage. Railways have an edge over road transport for carrying small loads, which cannot be economically transported by truck. In many cases, however, train schedules are unsuitable for fish dispatch. Fish is carried by head load, shoulder sling, rickshaw, rickshaw van and push cart from wholesale markets to local retail markets as well as from collection points to wholesale markets if the distance between them is short.

Packaging

Packaging materials include bamboo baskets, wooden boxes, oil drums (for live fish), plastic sheets and jute bags. Modern packing boxes are not used and plastic ones are rarely used. Some natural materials, such as *hogla* leaves, banana leaves and water hyacinth, are used as insulation (with or without ice) and as cover. The availability of containers for transportation is not a problem, but the multitude of designs and irregular sizes of containers create handling and transportation difficulties. The average capacity of wooden boxes used in Bangladesh, for example, ranges from 185 kg to 250 kg, while those used in Korea and Sri Lanka vary from 26 kg to 40 kg (Rapport Bangladesh Ltd. 1986). Bamboo baskets also are of different sizes, and may contain one to three maund of fish. The largest of these are difficult to handle. The oil drums used to carry live fish are inconvenient for transportation.

2.4 Economic Efficiency

There is a widespread belief that the high marketing margins found in Bangladesh indicate that the country's fishermen are highly exploited by middlemen. Ahmed (1983), however, concluded that the profits taken by fish traders, although high, cannot be considered excessive in comparison with other farm food marketing and in light of the high risks involved in fish trading. Rahman (1992), in his analysis of commodity markets, found that market price spreads for fish and poultry were not excessive, indicating competitive domestic market conditions for these commodities in Bangladesh.

The ODNRI study (Coulter & Disney 1987) recognised the weak bargaining power of fishermen due to economic dependency, poor communications with markets, lack of ice, etc., and Islam (1989) observed that the lack of standards for quality, grading, and weighing leave both fishermen and consumers at the mercy of fish traders. He concluded that bonding practices and an oligopolistic market prevailed because fishermen depended on the traders for their working capital.

At some major wholesale markets, *aratdar* restrict the entry of new competitors into the markets. Ahmed (1983) found that the number of *aratdar* and wholesalers in the wholesale markets in Swarighat (Dhaka), New Market (Dhaka), Chittagong and Khulna had remained the same for 10 to 15 years and that 8% to 10% of them controlled 55% to 65% of the entire business of the local market. This indicates a large degree of control over who is allowed to participate in the market.

2.5 Finance and Credit

Fishermen and small fish traders rely on *mahajan*, *aratdar*, and large traders for short-term credit. Loans are taken both for production and household purposes and traders usually repay in cash. Fishermen, on the other hand, often repay their loans in fish.

The loans that fishermen take from fish traders are generally tied to fish catch. Under the terms of the arrangement fishermen are compelled to surrender their catch to the creditor, sometimes at a dictated price. Professional moneylenders command exorbitant rates of interest, but they can be advantageous for short-term borrowers who need money immediately and without any collateral.

A 1987 survey of rural credit in Bangladesh (BBS 1989) found that informal sources supply about 68% of rural credit. Borrowers whose major occupation is fishing accounted for only 2.11% of total rural credit, and only 1.12% of all bank loans were taken expressly for fish-related activities. The survey also found that 41.70% of all non-bank loans were taken for household purposes.

Middlemen usually finance their businesses from their own sources. Some *faria* and small *bepari* are financed by *mahajan* and *aratdar*. *Aratdar* also allow credit purchases by *paikar* and retailers.

The Third Fisheries Project (1993) found that fishermen engaged in open water fisheries rely almost entirely on informal sources and NGOs for credit. Most of this credit comes from moneylenders who charge 10% interest or more per month. The study concludes that it is unrealistic to expect banks to provide credit for fishermen. Credit is best provided by NGOs. The project made several recommendations for improving the rural credit delivery system.

Ahmed (1983) found that institutional credit accounts for only 0.35% of fishermen's total credit requirements. Institutional credit is generally geared to capital investment projects such as hatcheries, rearing ponds or intensive pond operations. The New Fisheries Management

Policy (NFMP) has a provision for bank credit through Krishi Bank, which will provide loans for the purchase of fishing gear, but the bank's fisheries investment window caters more to capital investment projects. Most fishermen are unaware that the bank has a credit window for them (FAP 6 1992).

2.6 Institutional Support

The Role of the BFDC

The Bangladesh Fisheries Development Corporation (BFDC) is the only public sector agency providing institutional support to the fishing industry. Its principal function is to provide landing centres and wholesale markets for use by the private sector. Table 2.1 summarizes the facilities provided.

Table 2.1 BFDC Facilities

Facility	Number (Capacity)	Location
Fish Harbour	1	Chittagong
Landing Centre and Wholesale Fish Market	10	See Box 1
Ice Plant	13 (274 mt/day)	Chittagong, Cox's Bazaar, Rangamati, Dhaka, Mongla, Khepupara, Patharghata, Barisal, Khulna, Rajshahi, Daborghat
Cold Storage	11 (635 mt/day)	Chittagong, Cox's Bazaar, Rangamati, Pagla, Mongla, Khepupara, Patharghata
Freezing	5 (61 mt/day: 49 mt blast freezing, 12 mt plate freezing)	Chittagong, Cox's Bazaar, Rangamati, Pagla, Mongla
Frozen Storage	5 (1,380 mt/day)	Chittagong, Cox's Bazaar, Rangamati, Pagla, Mongla
Fish Meal Plant	3 (8 mt/day)	Chittagong, Cox's Bazaar, Mongla
Fish Carrier	10 vans, 1 vessel	
Trawlers	8 (2 for shrimp, 6 for fish)	
Net-Making Factories	3 (190,512 kg/yr)	Chittagong, Mongla, Comilla

Source: BFDC

BFDC's 10 landing and wholesale markets can handle about 22,000 mt of fish per annum, but in FY 1991-92 they handled only 4,548 mt (93% from freshwater sources). This is a small part of the national catch. The agency's 13 ice plants have a total production capacity of 247 mt of ice daily and 11 cold stores have a 635 mt capacity. The plants and stores are all located near the agency's landing places and wholesale markets. The cold stores in

Chittagong and Khulna, which are export-oriented, operate at about 50% of capacity.[4] While the landing centres in Chittagong and Cox's Bazar function near capacity, others, including a big centre at Daborghat, Sunamganj, are practically idle. For a variety of reasons, including location, design and siltation, these facilities have not attracted traders involved in inland fish marketing (Coulter and Disney 1987).

Although the three BFDC net-making factories can produce 190,512 kg of fish net annually, during the past five years, the maximum annual production was 93,092 kg in 1989-90 and the lowest production was 23,358 kg in 1991-92.

In recent years, BFDC has been involved in the retail sale of fish in Dhaka, distributing freshwater and marine fish to the public through private market stalls, BFDC's own stalls and rickshaw vans. But the quantity sold by BFDC is too small to influence price levels in the country's fish markets. In 1992-92 BFDC retailed 644 mt of fish in Dhaka (BFDC 1992).

The Role of Co-operatives in Fish Marketing

Cooperative societies (*samity*) have not been active in the marketing of inland fish. Fishermen's *samity* primarily concern themselves with the securing of leasing rights to large government-owned and -managed water bodies. These societies suffer from several organisational problems: lack of a real spirit of cooperation, admission of non-fishermen, exclusion of genuine fishermen from the management committees and low levels of management skill. These organisations make no organised efforts to sell member's produce.

Attempts to establish viable fisheries cooperatives in many developing countries proved extremely expensive and totally unproductive. And, indeed, the fisheries cooperative movement in Bangladesh has not been very successful. Fishermen are independent individuals and it is perhaps not too surprising that they do not readily cooperate with one another (Clucas 1981). Despite this, Nuruzzaman (1993) suggested that market operations and methods could be improved by the establishment of a cooperative marketing system run exclusively by fishermen.

[4]BJMSS, the national fishermen's cooperative, also has ice plants and cold storage facilities in Chittagong and Khulna, but they too are highly underused (Rapport Bangladesh Ltd. 1986).

2.7 Trade Volume and Income of Fish Traders

Previous studies of fish marketing contain no information on the number of fish traders or trends in their activities.

FAP 12 (1992) found that the number of fish traders attending markets in areas affected by FCD projects has increased in most cases by 45% to 150%. The study also noted that many full-time fishermen turned to fish trading on a part- or full-time basis as a response to declining catch rates attributed to FCD interventions. It also noted that the quantity of fish sold per trader decreased by nearly 60% in survey area markets. The study was uncertain whether these changes were entirely project-related or if other factors contributed.

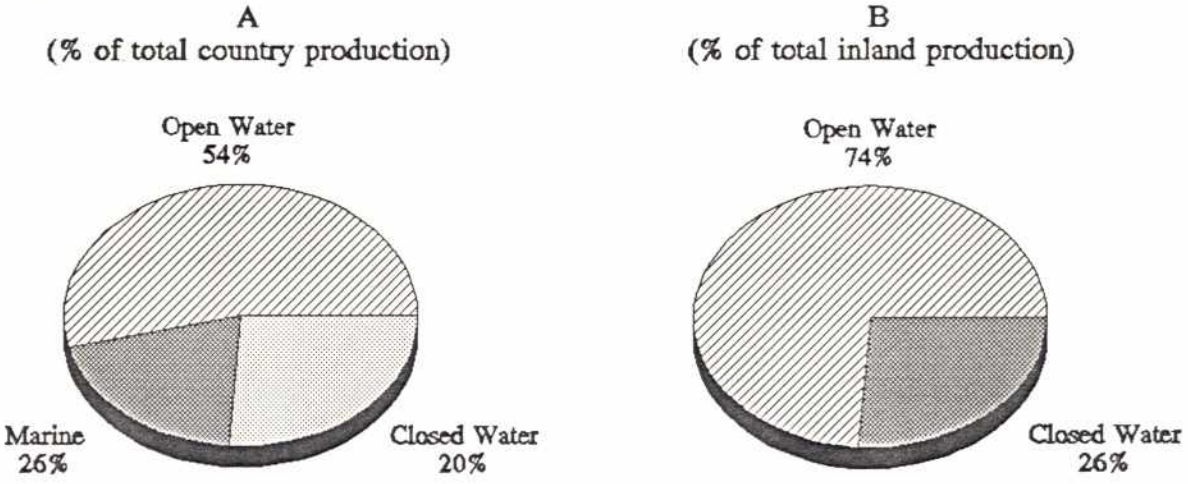
Most fish traders covered by FAP 12 RRAs reported that their incomes had declined over time and that the main cause was the increasing number of traders competing for smaller quantities of fish. Only a few traders reported increased incomes due to heightened demand for higher-priced fish.

ORGANISATION OF PRODUCTION AND DISTRIBUTION

3.1 Production and Production Systems

The fisheries production system in Bangladesh includes both inland freshwater fisheries and marine fisheries. Of the nation's total fish production, 74% comes from the inland systems and 26% comes from the marine fisheries (Figure 3.1A). The freshwater fisheries system consists of open water capture fisheries and closed water culture fisheries. Open water capture fisheries account for 74% of the total inland production and culture fisheries contribute 26% (Figure 3.1B). Marine fisheries comprise two subsystems, industrial and artisanal.

Figure 3.1 Sources of Fish Production in Bangladesh



Source: DoF

Open Water Capture Fisheries

The open water capture fishery system is natural and uncultivated. It consists of all open water bodies, including rivers, canals, *beel* and floodplains. The system is self-reproducing and self-sustaining, provided the water regime upon which it depends remains intact. The production potential of capture fisheries heavily depends on the pattern of monsoon flooding, during which fish increase both in number and biomass.

The total area of inland waters having fish production potential is estimated to be 4.29 million ha. Of this, an estimated 1.45 million ha are perennial waters; the remaining 2.83 million ha are crop fields and other low-lying areas that retain monsoon water for four to six

months (Islam 1989). According to Master Plan Organisation (MPO) estimates, the area inundated to a depth of 30 cm or more during the monsoon season (sufficient to support fish production) is 5.77 million ha.

Seasonal *beel,* which dry up naturally or are pumped out, are completely harvested every year. Permanent *beel* are also fished every year but a few are harvested every third year in order to allow fish stocks to grow and recover. In the Sylhet-Mymensingh basin of the North East Region, 42% of the *beel* are seasonal; in the Faridpur basin of the South West Region, 80% are seasonal (MPO Main Report 1987).

The harvesting of fish from the open floodplains is done mainly by subsistence fishermen during the monsoon months, and the peak harvest periods generally coincide with the receding flood waters. The country's major river systems and estuaries make substantial contributions to commercial fishing.

Closed Water Fisheries

Closed water bodies are those having controlled physical conditions or having no links with rivers or floodplain systems. These water bodies, which include ponds, *baor* (oxbow lakes) and Kaptai Lake, offer opportunities for aquaculture. Coastal shrimp farms can also be considered closed water fisheries.

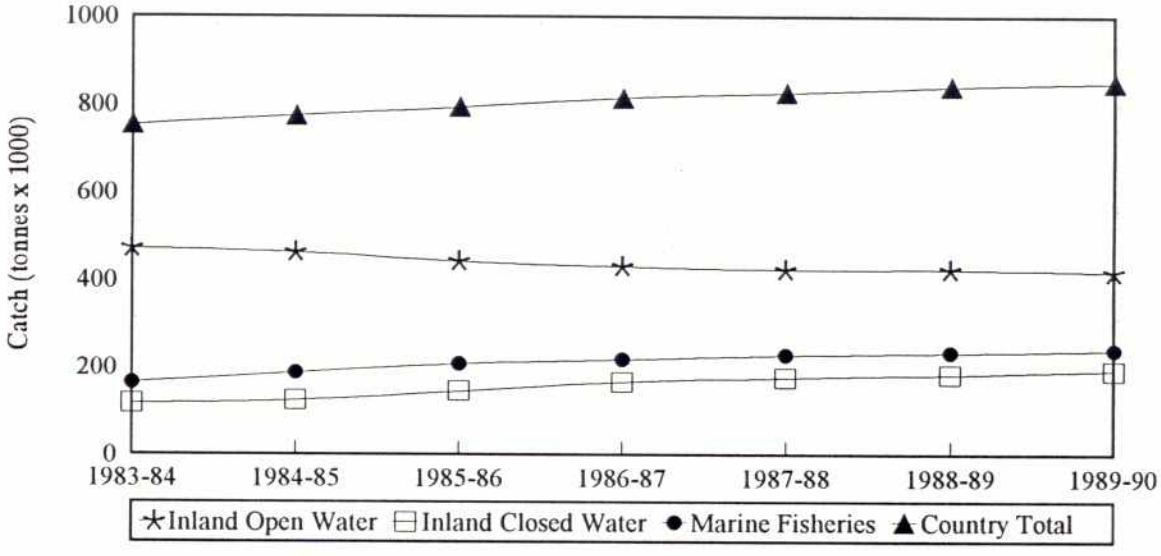
Marine Fisheries

Bangladesh has 480 km of coastline and its declared exclusive economic zone in the Bay of Bengal covers an area of about 70,000 km^2. The exploitable stock in the bay consists of shrimp and demersal and pelagic fish. Shrimp primarily are harvested by off-shore trawlers and nearly all the harvest is processed and exported.

3.1.1 Production Trends

The production trends presented in Figure 3.2 are based on statistics produced by BFRSS for the seven-year period 1983-84 to 1989-90 (Appendix A, Table 3.1). During that period, total production increased by 13%, rising from 753,502 mt in 1983-84 to 849,962 mt in 1989-90. The average annual growth rate was 2.1%.

Figure 3.2 Trends in Fish Production for the Period 1983 to 1990



Source: DoF

Open Water Fisheries

During the seven year period, open water capture fisheries production decreased by 1.9% per annum from 471,595 mt to 418,307 mt. This fall in production was more pronounced for the Sundarban (3% per annum). Floodplain production likewise decreased, dropping from 200,616 mt to 178,000 mt (1.9% per annum), and *beel* production declined from 51,373 mt to 46,594 mt (1.6% per annum).

The annual production levels of capture fisheries vary according to the source of catch. These fluctuations are the result of differences in the timing, depth and duration of flooding, all of which affect fish production. Detailed information on changes in production levels by source are presented in Appendix A, Table 3.2.

Open water capture fisheries, which account for 70% to 80% of the freshwater catch, are under increasing pressure as the number of people exploiting the resource grows. Moreover, if the present trend toward increasing FCD/I interventions to meet the demand for agriculture continues, it would result in a systematic loss of fish habitat and fisheries production. As of 1986 an estimated 2.1 million ha of floodplain had been lost to fisheries through FCD projects. Under these circumstances, another 2 million ha is likely to be removed from fisheries by the year 2005 (MPO 1987 b).

FCD works restrict the passage of fish fry, juveniles and migratory adults. In most cases, the projects reduce the water surface area of *beel* and the recruitment of economically important species, such as major carps, into these habitats. The increased use of pesticides and fertilizers for agricultural purposes in FCD-protected areas and the spread of fish diseases in epidemic form are believed to have reduced productivity of the open water fishery system. Some of the production loss in the open water system may be recouped or even enhanced by stocking programmes. The Third Fisheries Project has initiated a *beel* stocking programme, which is still in the experimental phase. Fisheries loss mitigation measures need to be integrated with future water resource planning to maintain species diversity and the production level of open water fisheries.

Closed Water Fisheries

Closed water culture fisheries production grew an average of 10.8% per annum between 1983-84, when it yielded 117,025 mt, and 1989-90, when 192,592 mt were produced (Appendix A, Table 3.1). The production growth rate for ponds averaged 8.6% per year over the period, and brackish water aquaculture averaged an impressive growth rate of 39.17% per annum, increasing from 8,219 mt to 27,505 mt.

It is generally believed that closed water fisheries in Bangladesh have great potential for expansion. Ponds already cover about 146,890 ha (BFRSS), and while FCD and FCD/I projects may reduce and alter open water fisheries habitat, they can also create more congenial conditions and manageable habitat for aquaculture. Embankments, for example, prevent the inundation of ponds. In order to maximize the potential benefits FCD projects may have for culture fisheries, however, replicable stocking and management programmes need to be established. Thus far this has not been accomplished in existing FCD projects.

Marine Fisheries

During the seven-year period 1983-84 to 1989-90, total marine fisheries production rose steadily by 7.5% from 164,882 mt to 239,063 mt. Artisanal production grew by 8.6% annually, while production of the industrial subsystem fell by 3.6% per annum over the period.

No reliable data exist on the standing stock, potential yield or maximum sustainable yield of the marine fisheries of Bangladesh. It is evident, however, that the ecosystem responsible for sustaining marine fisheries is being disturbed by inundation of mangrove forests, pollution of coastal waters, coral reef degradation and overfishing. These issues need to be addressed in order to sustain marine fisheries production.

3.1.2 Main Market Species

The main types of fish caught in inland waters and traded in the markets are:

Major carps	-	*rui, katla, mrigal*
Exotic carps	-	silver carp, common carp (*karfu*), mirror carp, grass carp
Other carps	-	*ghania, kalbaus/kalia, bhagna*
Live fish	-	*koi, singi, magur*
Catfish	-	*rita, boal, pangas, shillong, aire, baghair, bacha, ghaura, pabda*
Spiny eels	-	*tara baim, guchi baim, baral baim, gutum*
Snakeheads	-	*shoil, gazar, taki*
Feather backs	-	*chital, foli*
Small fish	-	*puti, tengra, bujuri, bailla, tilapia, chanda, bata, mola, kachki, kajuri, batasi, khorsula, meni/bheda, kaikka, khalisa, chela, sarputi, chapila, etc.*
Shrimp	-	*gura icha, tengua chingri, chotka chingri*
Large prawn	-	*golda*

Ilish, which is found in almost all Bangladesh fish markets, can be marine or riverine in origin. Catch statistics for the 1985-86 to 1988-89 period show that 50% to 57% of the *ilish* production is from estuaries and the offshore waters of Bangladesh (Appendix A, Table 3.3). *Ilish* constitutes more than 40% of the total river catch. While the fish is available throughout the year, peak harvests occur from August through October and January through March.

Carps are caught in rivers, *beel*, *haor*, floodplains and Kaptai Lake. Major carps are the most important species supplied by pond culture. The *beel* carp harvest peaks between January and April and that of rivers during November and December. Floodplain-dependent species arrive at the markets from May to December, with the peak harvest occurring from October to December. Rural fish markets are dominated by various small fish species.

3.1.3 Sources of Supply

Main rivers, secondary rivers/*khal*, *beel*, floodplains, *pagar*/ditches and ponds all support freshwater fish production. Fishermen get their harvest from one or more of these production

areas. Fishermen select the type of fishing ground subject to their access to the water body, seasonal variation in productivity and gear availability.

The contributions various fishing grounds make to production are shown in Table 3.1.

Table 3.1 Percent Contribution of Fishing Grounds to Fish Supply

Region	Fishing Ground						
	Main River	Secondary River/*Khal*	*Beel*	Flood-plain	Ditch/ *Pagar*	Pond (own)	Pond (other)
North Central	26	32	11	5	5	21	0
North East	4	4	68	18	4	4	0
North West	0	18	64	7	0	11	0
South West	0	11	50	4	4	11	21

Source: FAP 17 Market Survey, 1993

The table shows that 50% or more of the fishermen in the North East, North West and South West regions drew their harvest from *beel*. In the North Central Region, 58% of the fishermen harvested fish from main rivers and secondary rivers/*khal*, and 21% got their catch from ponds. Floodplains and *beel* were fishing grounds for 86% of the fishermen in the North East and 71% in the North West. The highest percentage of fishermen exploiting the productivity of ponds (32%) was in the South West and the lowest (4%) was in the North East.

3.1.4 The Role of Fishermen

The fish marketing chain starts with the fishermen who catch fish in open water bodies or harvests them from closed ones. Open water fishermen work either individually or in groups on rivers, canals, *beel*, *haor*, and floodplains. Artisanal fishing ranges from very localized efforts to intensive mobile fishing operations using country boats and traditional gear. Seasonal variations in fish stocks and variable catch composition are the dominant features of capture fisheries.

Some large-scale *mahajan* and *aratdar* in major assembly and wholesale markets organise fishing operations with their own equipment and hired labour. Ahmed (1983) estimated their share of the total production at 3%.

Fishing groups working in major rivers, *haor*, and large water estates (*jalmahal*) commonly are made up of a number of fishermen from different households. In the formation of these

groups, kinship ties are often the first criterion for selection, followed by professional standing and residence in the same community. Hindu fishing groups sometimes include Muslim wage labourers and marginal farmers. According to one survey source, a community leader in the Sonatala fishing hamlet, Muslims are included in his group as a measure of social security. The catch taken by group operations is sold collectively and the proceeds, after deduction of team expenses, are shared among the members. The owner or owners of the boat and net used each earn a share of the catch proceeds and group members get a smaller labourer's share.

In Bangladesh, fishing in large water bodies is administered by the government. The main fishing grounds within these water bodies are divided into *jalmahal* and each is usually leased out for a period of one to three years. The lessee usually subdivides his *jalmahal* into smaller units, which are then rented by sublessees. The lessee and sublessee may be individuals or a fishermen's association. If an association is the leaseholder, the cost of membership in the association constitutes the access fee and non-members pay a separate access fee. Some lessees and sublessees allow subsistence fishing in their leased area.

The owners of pond fisheries are usually not professional fishermen and therefore hire professionals to harvest the pond either as wage labourers or on a share basis.

Most fishermen sell their catch from their boats, but some carry the fish back to their home landing places and some, if time permits, take the fish to the nearest assembly or secondary market. Sales transactions are made either directly with the *mahajan* or trader or through a *dalal*. Some fishermen sell fish directly to consumers in their own or neighbouring villages.

Traditional fishermen historically are a poor and socially a backward class. The majority are dependent on moneylenders and fish traders to meet their subsistence needs. Assemblers often provide fishermen with cash advances (known as *dadan*). This arrangement obliges the fisherman to deliver his catch to the assembler at a price that is often lower than its market value. As a result of their economic dependency, few fishermen enjoy the freedom to choose their buyers or the market where they sell their catch.

Extreme poverty and indebtedness forces fishermen to fish without much regard to price fluctuations. Since they are under constant pressure to repay loans and advances, fishermen cannot even respond to very low prices by scaling back their efforts. When prices are rising, a fisherman's willingness to increase effort may be limited by his lack of sufficient gear.

Aquaculture operations are not as dependent on non-institutional credit sources, and their owner/operators therefore have greater investment freedom and flexibility to respond to price changes. Production risks and the relative prices of staple foods, on the other hand, may influence their production decisions.

3.2 Distribution

3.2.1 Evolution of Market Channels

Primary fish markets are tied to the resources of the fisheries within their command area. Usually these markets are at landing points conveniently located within a *beel* or on the banks of a river or *khal* connecting several fishing areas. The basic selection criterion for a market location is its convenience for both fishermen and traders. In rural areas general markets also sometimes provide a fish landing area. Primary markets are linked to important wholesale and assembly markets via highways and river routes.

Changes in the potential resources and productivity of a production system influence the size and number of fish markets in its vicinity. Many rural fish markets are seasonal in character. Primary markets dependent on *beel* fisheries, for example, start functioning with the onset of monsoon flooding and peak by November-December. Boalia market in the North West Region, which depends on fish from Gajna *beel,* operates from July to January. Ghater Bazar market, also in the North West but drawing its supply from the *beel* of Hakaluki *haor* and other adjacent *beel,* operates from August to December. Jagathnagar market, in the North Central Region, is closed from April to July.

Wholesale and assembly markets are either exclusively devoted to the sale of fish or are part of general markets known as *bazar* or *hat bazar*. These markets provide daily necessities, including both agricultural products and consumer goods. A section of the market is usually dedicated to the wholesaling and retailing of fish.

Most fish markets have been in existence for a long time, but new ones, particularly primary ones, emerge from time to time to suit the needs of fishermen and local traders. Special fish markets are sometimes organised to take advantage of a new production situation, as described in Box 2. These may last a long time or quickly die out, depending on the continuity of the new supply source.

3.2.2 Market Frequency and Timing

FAP 17 surveyed 30 fish markets in the North East, North West, North Central and South West regions. Six were collection points, 12 were *bazar* and 12 were *hat bazar*. Table 3.2 shows the distribution of these markets among the four regions. FAP 17 also surveyed three wholesale fish markets, at Swarighat, Kawran Bazar and Kamlapur in Dhaka. These markets exclusively sell fish.

Machhuakhali Fish Market

A public cut made in the BWDB embankment in Manumukh union during the 1993 flood linked Machhuakhali beel (part of Kawadighi haor) with the Kushiyara River. This link has subsequently become a convenient route into the beel for river fish. Local people soon realized this, and a resident of Islampur village promptly secured a lease from BWDB and the revenue office to fish the borrow pits and land adjacent to the cut. Fishermen are allowed to catch fish in the leased area for a fee.

To support this new industry about 20 to 30 chhalia (faria) visit the area to collect the daily harvest, which is 15 to 20 maund of fish. A special fish market has also grown, including a few sheds and tea shops on the embankment. With the closure of the cut, the fish market probably will vanish.

Box 2: A Special Market

Table 3.2 Distribution of Sample Markets by Type and Region

Region	Collection Point	*Bazar*	*Hat Bazar*	Total
North Central	1	2	3	6
North East	2	6	0	8
North West	2	3	3	8
South West	1	1	6	8
Total	6	12	12	30

Source: FAP 17 Market Survey, 1993

The markets in the *hat bazar* category are conducted both in the *bazar* and on *hat* days. Fish wholesaling is generally confined to the *bazar* sessions, while *hat* sessions offer retailing opportunities. Seven of the 12 *hat* in this category are held three times weekly, two occur twice and one occurs once a week (see Appendix A, Table 3.4).

Table 3.3 shows that 37% of the surveyed markets only operate in the morning. Most collection points open at dawn and all transactions are completed within two to three hours. About 40% of the markets operate in two shifts, morning and afternoon. Only 7% operate in the evening, and 10% conduct business all day.

Table 3.3 Distribution of Sample Markets by Occurrence Time and Region

Region	Morning	Evening	Morning + Afternoon	Morning + Evening	Morning + Afternoon + Evening
North Central	4	0	2	0	0
North East	0	3	4	0	1
North West	4	0	3	1	0
South West	3	0	1	1	3
Total	11	3	10	2	4

Source: FAP 17 Market Survey, 1993

3.2.3 The Market Tiers

Primary Market

Primary markets, the main meeting place for fishermen and traders, consist of important landing places and collection points. In the primary market the fisherman sells his catch to a mobile trader (known as a *mahajan, jogandar,* or *faria*),[5] who uses a boat or truck to collect fish. The trader may engage a local agent (*dalal*) to contact individual fishermen and pond owners. These agents generally earn a 1% commission for their services. Some traders collect fish directly from the fishing grounds. Local retailers and some fishermen sell fish to consumers at primary markets. *Arat* centres in some primary markets are important regional landing places.

Secondary Market

The participants in secondary markets (wholesale markets) are assemblers, *aratdar*, wholesalers (*paikar*), distributing traders (*bepari* and *chalani*) and retailers (*nikari*). Chief among these is the *aratdar*, who arranges the public auction of fish and facilitates negotiations between fish traders. The *aratdar*'s main concern is to increase income by increasing business volume. The most trustworthy *aratdar* and those who have earned the most cooperation draw larger numbers of buyers and sellers.

The assembler brings his fish to the secondary market and sells it to local retailers (*nikari*), local wholesalers (*paikar*) or distributors (*chalani* and *paikar*), who then transport fish to other districts and cities. Large transactions take place through public auction.

[5]The various participants in the fish market are described in Chapter 4.

On the retailing side of the secondary market, some fishermen, if time and resources permit, sell directly to consumers. Retail traders sometimes enter into partnerships with one another to buy out a fisherman trying to retail a large quantity of fish to consumers in order to eliminate competition.

Higher Secondary Market

Wholesale markets in districts and metropolitan areas are known as higher secondary markets. Distributors (*paikar* and *chalani*) generally export fish from the secondary markets to the higher secondary markets. In these markets they sell their fish to local wholesalers and retailers through local *aratdar*, who render services similar to those performed by their counterparts in the secondary markets.

Retail Market

Paikar sell both fresh and dried fish to retailers of outlying thana markets as well as to retailers in village markets (*hat*). Retailers then sell the fish to consumers at a price agreed between them through bargaining. Small *paikar* sometimes play the role of retailer in urban markets or village markets that are close to the source of supply.

3.2.4 Product Forms

Ahmed (1983) estimated that about 85% of the fish produced in Bangladesh is consumed fresh and 15% is marketed in cured form (dried, dehydrated, smoked or salted). About 74% is sold through wholesalers and retailers. The market share of the Bangladesh Fisheries Development Corporation (BFDC) and the national fishermen's cooperative (BJMSS) is only 2%.

Processing at landing sites and markets is limited and fish are normally marketed whole. Very large fish like *pangas*, *bhetki*, and often large *rui, aire,* etc., are cut into pieces for retail sale in urban markets. Some traders in the Khulna area keep stocks of *ilish* in cold storage for sale during lean periods.

BFDC has successfully introduced some frozen fish products for consumers. The average annual sale of these fish burgers, fish cakes, fish fingers, fish cutlets, fish balls and minced fish blocks is about 100,000 packets (BFDC 1993).

3.2.5 Seasonality in Fish Trade

The supply of fish in the marketing system is subject to wide seasonal fluctuations, as well as short-term variations caused by inclement weather, severe floods and other natural hazards. Each production subsystem has its own seasonal pattern, which is reflected in the volume of fish traded at domestic markets at different times of the year. The peaks and troughs in fish volume follow regular patterns and are in part linked to the main harvest periods for market-dominant species. During the peak harvests of *beel* and major ponds, for example, the fish supply increases significantly. In broad terms, the peak period stretches from October to February and the lean period runs from March to September (Appendix A, Table 3.5 lists the peak and lean periods for each of the markets studied).

The FAP 17 Market Survey found that the average daily volume of exports from lower markets to higher ones drops markedly during the lean period, but there are considerable regional variations. In the North Central Region, for example, the lean period volume of exports from primary markets is 59% of the peak level, while it is as low as 3% in the North West. The North West Region also has the lowest lean period exports from secondary markets, which are only 6% of the peak level. The highest lean period exports from secondary markets are in the North East, where they are 28% of the peak period (Appendix A, Table 3.6).

3.3 Specialization in Trade

The Market Survey results show that small fish species account for a large percentage of daily average trade volume for *aratdar* during the peak fishing season in all four regions. In the North East and North Central regions, major carps make up the next largest portion of volume. Other large species are important in the North West, and snakeheads are second to small species in the South West. During the lean period, major carps dominate markets in the North East and North West, while small species predominate in the North Central and South West regions (Appendix A, Table 3.7).

By far the largest portion of trade in both lean and peak periods is in *ilish*. Some *aratdar* specialize in this trade, organizing the movement of *ilish* from major landing places to other parts of the country. There is also a group of *bepari* and *chalani* that are full-time *ilish* traders.

The marketing of cured fish is also a specialized job. During the peak fishing season (October to January), when huge quantities of fish are caught and quick disposal of the catch is hampered by

the lack of ice and transportation, a portion of the harvest is cured by sun drying and salting. The cured fish flows through the same marketing channels as other fish, but there are three marketing tiers: fishermen to wholesale markets (secondary and higher secondary level); wholesale markets to urban and rural retail markets; and retail markets to consumers.

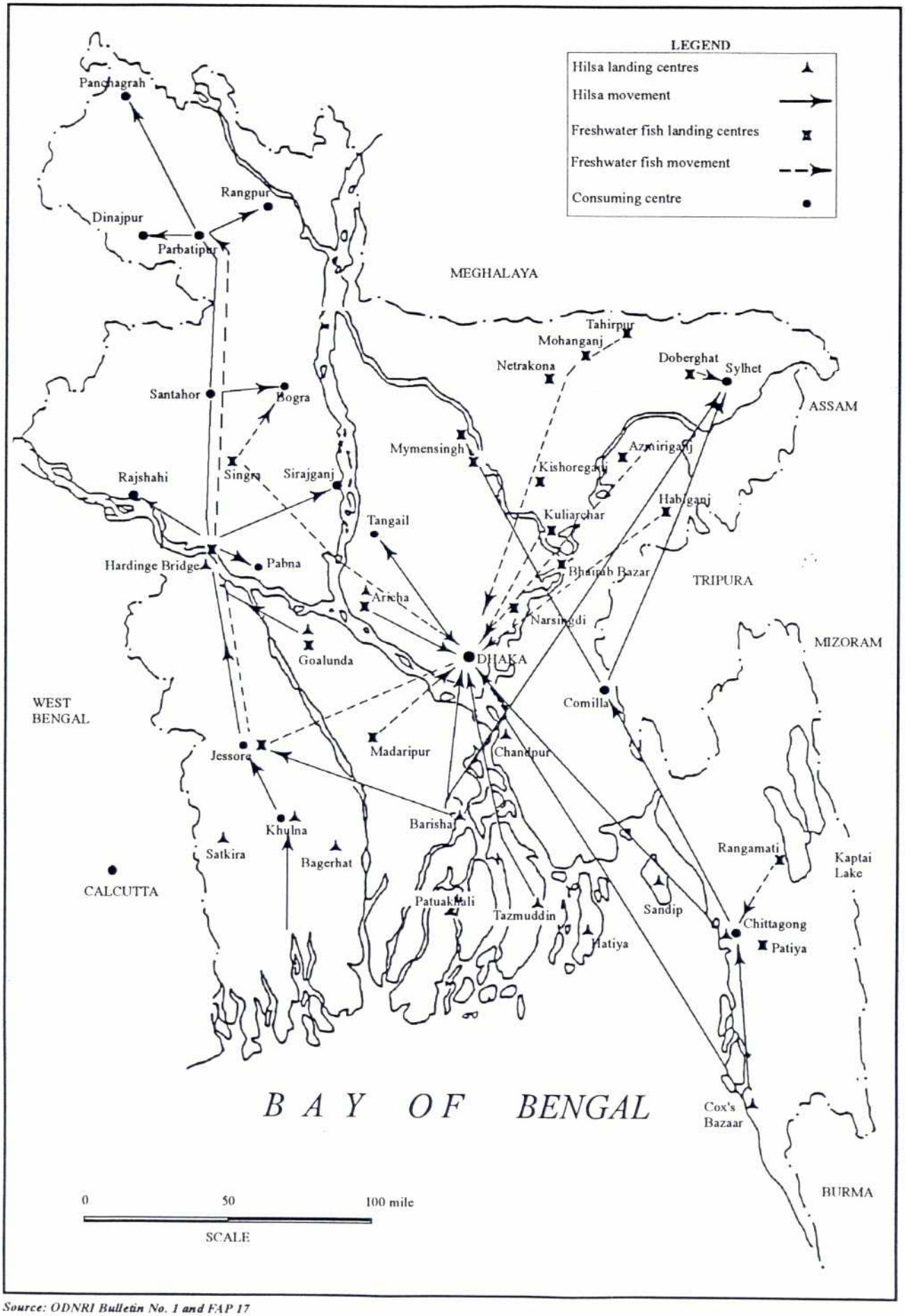
Aratdar and *paikar* collect the cured fish from fishermen. *Aratdar* in this market generally charge an 8% commission on the total sale proceeds, which is higher than the commission for fresh fish (Ahmed 1983). The *aratdar* then provides storage facilities and arranges for negotiations with distributing traders. *Paikar* generally buy dried fish from the fishermen/curers, although some collect fresh fish and process it into cured products.

3.4 Trade Flows

A substantial portion of the inland fish catch is consumed locally or within the same district. Some fishing areas produce surpluses, however, and these are shipped to other parts of the country where demand is higher or there is a deficit of fish. Figure 3.3 shows the major movements of inland fish and *ilish* in the marketing network. Most of northern Bangladesh, Dhaka and other urban centres are deficit areas. Some regions, due to seasonal variations in catch, are both surplus and deficit areas. The main areas producing surplus fish are the Sylhet-Mymensingh and Pabna-Rajshahi floodplains and the Madaripur-Faridpur *beel* area . The *baor* of Jessore and Kaptai Lake are also important supply sources.

Ilish has its own distinct trade flow. Estuarine *ilish* coming from the southern estuaries and coastal fishing areas are brought to major landing places in Chittagong, Barisal, Khulna, Cox's Bazaar and Chandpur. The major landing places for riverine *ilish* are Chandpur, Goalanda, Aricha and Hardinge Bridge. *Ilish* from all these landings are then transported to major fish markets and on to the consumer.

Figure 3.3 Trade Flows: Major Movements of Fish for Domestic Consumption



Source: ODNRI Bulletin No. 1 and FAP 17

3.5 Loss in Fish Trade

Fish traders assume greater business risks than grain traders. These risks arise from the difference between expected price and real price due to sudden fluctuations in short-term supply, third-party interference, qualitative product deterioration and transportation loss.

The trade loss exercise done for this study is based on a single day's transactions by the Market Survey respondents. Obviously, therefore, it is a partial analysis and cannot be treated as truly representative. The findings are presented in Table 3.4.

Table 3.4 Fish Traders Incurring Trade Losses

Trader Type	No. of Respondents	% Incurring Loss		
		Primary Market	Secondary Market	Tertiary Market
Faria	41	4.7	2.3	0
Bepari	48	0	4.3	0
Chalani	6	0	0	0
Nikari	75	5.3	0	0

Source: FAP 17 Market Survey, 1993

The highest percentage of fish traders incurring a loss is among *nikari* (5.3%) in primary markets. Next highest is for the *faria*, 4.7% of whom have losses in primary markets and 2.3% of whom have secondary market losses. Among *bepari*, only 4.3% incur losses in secondary markets. None of the *chalani* report losses, but the sample size is small.

4.1 Marketing Infrastructure

The fish marketing infrastructure in Bangladesh historically has been inadequate and poor in operational efficiency. Among the problems noted in the existing literature (see Section 2.3) are the physical facilities of markets and landing areas, the lack of standard packaging and ice to preserve fish, and inefficient transportation. This chapter discusses the findings of the Market Survey on these and related issues.

Improvements in the fish marketing infrastructure are essential not only to enhance current systems and practices, but also to support future additional demand for fish. Even though fish consumption per person declined from 28 gm/person/day in the early 1960s to an estimated 20 gm/person/day in 1989, population growth alone will place an increasing burden on current distribution systems. By 2005, if the population of Bangladesh is 165 million (using a moderate population growth rate) and per capita fish consumption increases slightly, to 20.9 gm/person/day, demand for fish would be 1,260 thousand mt (MPO 1987). If consumption should return to its 1960s level, fish demand would reach 1,668 thousand mt. Since there are indications that urban fish consumption has been growing at a faster rate than rural consumption, in the future larger volumes of fish will need to be shipped from surplus production areas to urban markets. In light of this, the system will need to be improved by adopting modern methods of fish processing, preservation and transport supported with adequate physical facilities.

4.1.1 Market Area and Structures

Fish markets are generally overcrowded, wet and unhygienic. Since business hours in wholesale markets are short, lasting only a few hours, people attending these markets are generally little concerned about sheds and permanent structures. Retail fish markets are particularly congested because most households prefer to purchase fish fresh daily. As a result, the fish section of the market is more crowded than, say, the vegetable or grain sections.

Business transactions in most fish markets, particularly rural ones, are more often conducted in open areas than in covered ones. Table 4.1 shows that the Market Survey found that the average covered area in primary markets is 114 m^2, compared to an average open space of 154 m^2. The average size of covered area in secondary markets (excluding Dhaka) is 133 m^2,

compared to 245.3 m^2 of open area. The average covered area in Dhaka secondary markets is 400 m^2 and open area averages 1,400 m^2. Tertiary markets, on average, have 148 m^2 of covered space against 229 m^2 of open area. Primary markets have an average of three sheds, while secondary and tertiary markets average 3.8 sheds.

Table 4.1 Average Covered Space, Open Area and Number of Sheds at Fish Markets*

Market Type	Average Covered Space (m^2)	Average Open Area (m^2)	Average Number of Sheds
Primary	114	154	3.0
Secondary	133	245	3.8
Tertiary	148	229	3.8

Source: FAP 17 Market Survey, 1993
*Dhaka sample markets are excluded. See also Appendix A, Table 4.1.

Regional variations occur in the market area size and number of sheds for all market types. The North West Region, for example, is better equipped with covered fish markets in all three tiers. Primary markets in the South West also have more covered area than open area. The North Central Region, by contrast, has the least amount of covered area in all three market tiers (Appendix A, Table 4.1).

None of the 16 sample primary markets is located in a building. Six have tin sheds with concrete floors and three have tin sheds but no concrete floor. One market operates under a thatched roof supported by bamboo poles. Six primary markets have no sheds at all. Of the 13 secondary markets one, in North West Region, is housed in a building; eight have tin sheds with concrete floors; and one has a tin shed but no concrete floor. The other markets have *arat* centres but no sheds. One of the four tertiary markets is housed in a building, two have tin sheds with concrete floors and one has a thatched roof on bamboo supports.

4.1.2 Landing Facilities

None of the sample markets had landing platforms. Instead, fishermen and traders use a section of the riverbank or *khal* bank conveniently close to the fish market. When water levels rise in the rivers and *khal* during the monsoon, it becomes possible to land right at many markets. In the dry season, on the other hand, the riverbanks used for fish landings become unapproachable due to low flows. Some landing centres, particularly the one at Swarighat, Dhaka, are partly or fully submerged during heavy rainfall or floods.

4.1.3 Wholesale Facilities

Wholesale fish marketing is usually done in a section of the general market. In some markets this trading is done on a roadside close to the main market, where *aratdar* and traders can be near a railway station or launch ghat to take deliveries or despatch their consignments.

The Market Survey found that physical facilities in sample fish markets for wholesale trade are either lacking or inadequate. Supplies of clean, pure water, which is critical to the prevention of microorganisms that can contaminate fish and to the reduction of odour were particularly notable. Generally water from adjacent rivers and *khal* is used for cleaning fish and washing down market floors. This water, which is also used for sanitary purposes, is likely to contaminate wet fish with faecal bacteria.

Respondents were also asked about piped water supplies and facilities for the short-term preservation of fish with ice. Some assembly centres were found to have overnight storage capability. Where this is done, fish are iced and covered with banana leaves in wooden crates and guarded during the night.

Water supply and storage arrangements in sample markets, shown in Table 4.2, are inadequate. Of the 33 sample markets in four study regions and Dhaka, only five have a regular water supply and some storage facilities. Nine markets have a water supply but no storage facilities. The remaining 19 markets, including 13 primary markets, have neither a water supply nor storage facilities of any kind.

Table 4.2 Facilities Available at Fish Markets* (number of markets)

Market Type (no. surveyed)	Wholesale Facility			Retail Facility		
	Water Supply; Storage	Water Supply; No Storage	No Water Supply; No Storage	Shed & Space		Open Area
				Adequate	Inadequate	
Primary (16)	2	1	13	4	5	7
Secondary (13)	2	5	6	4	3	6
Tertiary (4)	1	3	0	3	1	0

Source: FAP 17 Market Survey, 1993
*See also Appendix A, Table 4.2.

No cold storage facilities were found in or around sample markets. Traders in the sample markets do not use cold storage facilities built by BFDC; the reported reason was because they are located too far from the market.

4.1.4 Retail Facilities

Fish retailing is conducted within general retail markets. In urban retail markets fish sales area, parking space, sanitation, ventilation, water supply, and provisions for preservation are all either non-existent or unsatisfactory. The only special provisions urban retail markets make for the sale of fish is a row of concrete blocks on which fish are displayed and the retailer conducts his business. These retailers hire their "stall" or a space on a daily basis. In rural areas, fresh fish are generally retailed in open areas exposed to the sun.

The data in Table 4.2 indicate that retail trade is done in open spaces in seven sample primary markets and six secondary ones out of a total of 33 sample markets. In five primary markets, three secondary markets and one tertiary market, retail trade is conducted both under sheds and in the open, and space is inadequate. Four primary markets, four secondary markets and three tertiary markets have adequate covered area and sales space.

4.1.5 Support Services

Respondents were also asked about the availability of banking and telephone services in or around sample markets. The results, shown in Table 4.3, indicate that banking facilities are available in 79% of the sample markets and there is telephone service in 45% of them. Primary markets are the least endowed with these services; about 62% have some banking facilities and only 12% have telephone service. All tertiary markets have banking facilities and telephone service.

Table 4.3 Availability of Support Services* (percent)

Market Type (no. sampled)	Banking Facility	Telephone
Primary (16)	62	12
Secondary (13)	92	69
Tertiary (4)	100	100
Total (33)	79	45

Source: FAP 17 Market Survey, 1993
*See also Appendix A, Table 4.5.

4.2 Packaging, Sorting and Weighing

4.2.1 Package Types and Packaging Materials

Traders use packages of various types and sizes to ship fish to and between markets. Wooden boxes, bamboo baskets and oil drums are most commonly used, but other materials, including plastic sheets, jute bags and natural materials are used as well. No standard design or specifications are followed for packaging fish. Oil drums are used to carry live fish.

The Market Survey found that a majority of traders in all markets in all regions use bamboo baskets to carry fish. In all but the South West secondary markets over 70% of traders use baskets. Wooden boxes are more extensively employed in the South West, where 25% of traders in primary markets and 33% of those in secondary markets use the method. Metallic drums are most common in North West and South West markets. In Dhaka markets all three packaging types have about the same level of use (Appendix A, Table 4.4).

Natural materials, such as *hogla* leaves, banana leaves and water hyacinth are used as insulation, with or without ice, and also as cover. Banana leaves are used as packaging material in 12 sample markets and water hyacinth in nine sample markets. *Hogla* leaves are used only in primary markets in the South West Region (Appendix A, Table 4.4).

4.2.2 Sorting and Grading

Little systematic sorting and grading is done for freshwater fish, but the subject has never been fully investigated in Bangladesh. Scientific standardized grading systems exist, but introducing them would be quite difficult given the considerable variations in the size and quality of fish. Not only do fish size and quality vary according to their source but these factors also vary seasonally. Factors such as water quality and the availability of natural feed in the fish habitat affect the quality and taste of fish. Respondent traders were of the opinion that sorting or grading beyond what is currently practised would not be worthwhile, but a special study is needed to examine whether the costs involved (for additional labour, time, and ice) in scientific grading would be justified by market prices in Bangladesh.

The minimal sorting that exists consists of keeping fish of different sizes and characteristics together at the fishing grounds. Once the fish reach the primary market, they are simply sorted into broad categories of species and size. At assembly centres and secondary markets,

following the preference of *bepari, chalani* and *paikar,* fish are sorted by individual species and graded, customarily based on their texture and physical appearance. Small species may be left unsorted. At retail markets, some attempt is made to sort fish by source, variety, size and freshness. These factors, in addition to price, influence consumers' purchases.

BFDC has developed some standard criteria for categorizing fish by size. All large species are subdivided into three categories, large, medium and small, based on standard weights. Live fish are classified by length into two size categories. This is a traditional way of grading of fish and does not consider fat content or other biological aspects of the fish.

4.2.3 Weighing Systems and Practices

Fish markets use the metric system and a lot system to weigh fish, and some markets employ both systems. Table 4.4 summarizes the data collected by the Market Survey on weighing systems. The lot system, whereby weight is determined through estimation, is practised in 69% of the primary markets, 24% of the secondary markets and 25% of the tertiary market. The standard metric system is used in only 38% of the secondary markets and 50% of the tertiary ones. These markets consist of three primary markets in Dhaka, two secondary markets in the North West and one tertiary market each in the North Central and North West regions. The metric system of weights and measurement is practised more commonly in the North Central and North West markets than in those of the North East and South West.

Table 4.4 Weighing Systems Used at Sample Fish Markets* (percent)

Market Type (no. of markets)	Metric System	Lot System	Both Systems
Primary (16)	0	69	31
Secondary (13)	38	24	38
Tertiary (4)	50	25	25
Total (33)	21	46	33

Source: FAP 17 Market Survey, 1993
*See also Appendix A, Table 4.5.

In the North Central and North West markets where standard weights and measures are practised, retailers sometimes realize some extra weight when they purchase directly from fishermen. About 33% of the retailers in the North Central Region reported realising 4-10% extra weight and about 13% of the retailers in the North West reported getting 3-4% extra weight.

Customarily, extra weights are realized by traders as an accomodation for buying directly from fishermen.

4.3 Ice Supply

Keeping fish cold while it awaits packaging, sale or resale is the best way to protect it from deterioration. As the review of literature found, however, ice is not available in sufficient quantity. Although BFDC and BJMSS have ice production facilities (see Section 2.3) the locations of their plants are inconvenient for small-scale fishermen and traders. The usual ice supply source for inland fishing areas is a nearby ice cream factory.

FAP 17 surveyed ice cream factories and ice plants within 10 km of its sample markets. Information was collected on the location, daily production capacity, average actual production level and product types for 46 facilities. Traders may, in fact, get ice from sources more than 10 km distant, however. Traders from higher markets sometimes bring with them ice that they have procured from sources more convenient to them but quite far from the market. But too few do this to significantly affect the data on ice supply for the surveyed markets.

Only two of the ice plants surveyed have a production capacity of 10 mt; these mainly produce blocks. Eight factories have capacities of 1 mt or more, and the rest have production capacities ranging between 0.10 mt and 0.90 mt. The average actual production level of the factories surveyed is 69% of capacity. About 40% produce at 60% to 70% of capacity; 36% produce at 70% to 80% and 24% produce at 80% of capacity or more (Appendix A, Table 4.6).

As reported in Section 2.3, Ahmed (1983) has suggested ratios of 1.5:1 in the summer and 1.25:1 during the rest of the year, but the ideal ice/fish ratio for Bangladesh has never been established through study. The data in Table 4.5 (based on the volume of fish exported from market to market and the availability of ice from factories within 10 km) clearly show that ice is insufficiently used in the survey markets. In fact, since this information is based on interviews rather than on empirical study, it is likely that the actual ratios are even lower than the informants reported. There is clear evidence in the existing literature that these low ratios are due to shortages of ice, particularly at peak fishing periods, when the cost of ice rises with increased demand.

Table 4.5 Average Ice/Fish Ratios by Market Type and Region*

Region	Ice/Fish Ratios		
	Primary	Secondary	Tertiary
North Central	0.40	0.30	-
North East	0.41	0.28	-
North West	0.40	0.96	0.39
South West	0.40	1.22†	-

Source: FAP 17 Market Survey, 1993

*See also Appendix A, Table 4.7.

†Includes a 10 mt capacity ice plant at Madaripur

4.4 Transportation of Fish

4.4.1 Modes of Transport

Every available means is used to transport fish: head load, country boat, mechanised boat, launch, river steamer, rickshaw van, bus, truck and railway. Fishermen, who use small boats, usually keep their catch in the bottom of the boat or in small baskets they carry with them. The fish may or may not be covered with a wet sack, but ice is never used. The fishermen themselves may bring the catch to the landing points or assembly centres, or alternatively, agents for middlemen may collect the catch on the fishing grounds. Middlemen and their agents operate ordinary open country boats, but some use mechanised country boats. In either case the boats have no special facilities for preserving or carrying fish.

River craft provide the fish trade with inexpensive transport, but passenger launches and river steamers also lack special fish-transporting facilities. For travel over long distances, fish packed with ice in boxes or bamboo baskets is stowed among other cargo on the deck. An exception is consignments of fish from the Sylhet-Mymensingh *haor* basin to Dhaka, for which special launches with good icing facilities are engaged.

Bangladesh has an established network of roads linking major fish markets and important assembly centres. Transporting fish by trucks or buses is faster than boats or rail, but it is

also more costly. When road transport is used for fish, no ice is used for short trips, for long hauls it is packed with ice in boxes or baskets.

The railway system is used for *ilish* more than any other fish. Fresh fish can be transhipped by railway at concessional parcel rates provided it is packed in standard-size boxes approved by the railway authority. The trains do not have refrigerated or insulated wagons, but fish have the exclusive use of wagons on the Chandpur-Chittagong and Goalandghat-Ishurdi-Santhahar runs.

The Market Survey data in Table 4.6 indicate that water craft are the most important mode for the inbound movement of fish to both primary and secondary markets. Trucks and buses are a major mode both for inbound and outbound shipments of fish in secondary and tertiary markets.

Table 4.6 Modes of Transportation Used for Inbound and Outbound Movement of Fish by Market Type (percent)

Market Type	Frequency Distribution of Transport Mode													
	Head Load		Boat		Mech. Boat		Rickshaw Van		Bus		Truck		Rail	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Primary	30	9	34	0	18	23	10	14	5	34	3	20	0	0
Secondary	9	0	11	0	23	5	15	17	20	30	15	42	7	6
Tertiary	10	5	0	0	0	0	42	18	23	37	22	40	3	0

Source: FAP 17 Market Survey, 1993

Boats are responsible for the majority of fish shipments into primary markets from fishing grounds, accounting for a total of 52%. Head load, at 30%, is the next most common transport mode. About 68% of the consignments leaving primary markets are carried by road transport, with buses taking 34% of the volume. River transports carry 23% of the fish transhipped to other destinations.

Water transport is also important for moving fish into secondary markets, accounting for 34% of the volume. Road transports carry 35% of the shipments into secondary markets. Trucks and buses are the dominant mode of transport for outbound fish shipments.

Boats are not used at all for shipments into or out of tertiary markets. Instead, inbound consignments are mainly carried by rickshaw van (42%), road transport (45%) or head load (10%). Outbound shipments from tertiary markets to peripheral markets use the same modes in slightly different proportions.

4.4.2 Transportation Loss

About 40% of all *faria* in the four study regions reported major quantitative or financial losses due to transportation during the previous five years. The modes of transport responsible for those losses were: head load (16%), boat (12%), truck (5%), and train (7%). Among *bepari*, 57% reported transportation losses. Head load was responsible for 5%, water transport for 19%, road transport for 30%, and rail transport for 3% (Appendix A, Tables 4.9 and 4.10).

Long transportation time was identified by 26% of the *faria* and 30% of the *bepari* as the cause of their loss. Transport breakdown was reportedly the cause for 14% of the *faria* and 20% of the *bepari*. Five percent of the *bepari* said the extortion of money was the source of the loss. Only 2% of the *bepari* reported that preservation difficulties during transport was at fault.

MARKETING AGENTS AND THEIR ROLES

5.1 The Marketing Agents

Between the primary producers (fishermen/pond owners) and the consumers are a number of market intermediaries: *dalal, faria, bepari, aratdar, paikar, chalani,* and *nikari*. Although all of these occur in every market tier, their relative numbers and importance vary, not only between different market levels but also from peak season to lean (see Appendix A, Tables 5.1 and 5.2). This chapter describes the function of each intermediary in the marketing of fish and presents the Market Survey findings about the degree of their involvement, their transaction methods, relationship to their community and level of competition. The chapter also briefly discusses women's current and potential roles in fish marketing.

Dalal

The *dalal* is a broker acting for *mahajan*, *bepari* or *aratdar* acting as *mahajan*. He receives fish from fishermen and delivers them to agents of the *mahajan* or *bepari* who station themselves at a convenient point in or near the fishing ground. *Dalal* usually receive a 1% commission on the producer's price. Fish traders collect about 47% of the total catch through *dalal* (Ahmed 1983).

Faria

Petty traders who purchase fish directly from fishermen and sell it to *bepari* are called *faria*. Many of these people have other occupations and are only part-time fish traders. Some people, for instance, become fish traders during peak seasons when production is at its highest. *Faria* arrange their own financing and run their business as an enterprise. *Faria* are comparatively more active in secondary markets than in primary or tertiary ones. In the FAP 17 sample markets an average of 136 *faria* attend secondary markets daily, compared with 50 in the other market tiers. In fact, only in the North East do any *faria* operate in tertiary markets. About 43% of the *faria* reported operating only in one market, 52% in two markets and 5% in three markets.

Bepari

The *bepari* is a professional fish trader. He purchases fish from *faria* or fishermen and sells his merchandise to retailers or other distributors through an *aratdar*, usually in a secondary market. There are two types of *bepari*: one mainly purchases fish from *faria*, the other

collects fish directly from fishermen. Those who primarily deal with *faria* are often seasonal traders who have other occupations during lean periods. Those who get their fish from the fishermen are comparatively more wealthy and generally conduct business from their own boats. *Bepari* operate in all market tiers, but the Market Survey found none at primary markets in the North East or South West regions. The survey found an average of 40 *bepari* at primary markets, 300 at secondary markets and 87 at tertiary markets. They are particularly prominent at secondary markets in the North East, where an average of 417 *bepari* attend daily, and in Dhaka wholesale markets, where there is a daily average of 500. Fifty-five percent operate in one market, 27% in two markets, 11% in three markets and only 7% in more than three markets.

Paikar

Paikar are local traders who purchase fish from wholesale markets and resell them to local market retailers. Dhaka wholesale markets have the largest concentration of *paikar*, averaging 1,433 such traders.

Chalani

Chalani are actually *paikar* and *bepari* who buy and tranship fish from secondary markets to higher secondary markets. These traders sell their consignments to another set of *paikar* through the higher markets' *aratdar*. Although *chalani* are normally active in secondary markets, the Market Survey found a daily average of 150 of them in North East primary markets during the peak period. None are present in the same markets during the lean period. A similar situation was encountered in the North Central Region, where a daily average of 200 *chalani* attend secondary markets only during the peak season.

Aratdar

The *aratdar*, the key role in fish marketing, serves as a facilitator for deals between *faria* and *bepari* on one side and *paikar*, *chalani* and retailers on the other. He usually maintains an establishment with some salaried personnel and hired labour who perform such functions as loading, unloading, weighing, sorting, and grading. He operates his business under a licence.

The title "*aratdar*" is also sometimes applied to traders who are, in fact, not licensed *aratdar*. Two traders each in Poysarhat and Ghagar markets in the South West Region are locally known as *aratdar* because they own *arat* centres. In reality they are large-scale *bepari*, buying directly from fishermen or *faria* and shipping to Dhaka markets. They do not act as commission agents in these transactions.

The main function of the *aratdar* is to conduct public auctions of fish. In return, he receives a sales commission ranging from 3% to 6% of the sale price. Independent sellers and fishermen generally pay a 3% commission to the *aratdar*, while those who have taken advances (*dadan*) pay from 4% to 6%. By custom the *aratdar* also takes from the purchaser a 5% to 10% share of the fish (called *tola*) ostensibly to cover overhead costs.

The influence of *aratdar* extends beyond the power of their designated function, however. Some *aratdar* are effectively large wholesale traders, controlling the movement of fish stocks around the country from surplus to deficit areas. *Aratdar* also buy some of the larger fish harvests from fishermen. Some supply local retailers and distributing traders with fish. Others act as *chalani*. An *aratdar* in Madaripur fish market, for example, supplies prawns and fish to exporters in Khulna.

Aratdar who deal in *ilish* buy their fish by placing telephone orders with traders or other *aratdar* around the country. These transactions are based on credit guaranteed with collateral the *aratdar* deposit with their creditors at the start of the season.

Unlike *aratdar* operating in the paddy or jute markets, fish *aratdar* do not have permanent godowns. Such facilities would require costly cold storage capability to be of much use. Nonetheless, most *aratdar* are able to store fish overnight, thereby enabling them to exercise some control over the supply of fish to local markets.

In addition to facilitating negotiations for trade, *aratdar* provide fishermen and buyers with short-term credit. This ensures a steady flow of trade volume year-round. Most provide interest-free advances (*dadan*) to fishermen without requiring any collateral. At some markets, however, *aratdar* get higher commission rates (4-6%) from fishermen who take credit. The principal is recovered in instalments mutually agreed upon between the two parties. *Dadan* can be carried over into the next year if the full amount is not realized by the end of the main fishing season.

Aratdar were found at every market tier in all study regions. By far the largest concentration of them is in Dhaka wholesale markets, where an average of 103 *aratdar* was found.

Nikari

Nikari are people who are engaged in retailing; more specifically, Muslims who retail fish. Hindus retailers are commonly known as *jalliya*. Muslim fishermen, called *giani* in the North

West and North Central regions and *maimul* in the North East, were traditionally forbidden to cut fish for sale. The term "*nikari*" came to be applied to *giani* who violated this custom.

The *nikari* is the last link in the fish marketing system. Regular retailers have permanent stalls or space in fish markets. In urban markets, a regular retailer needs a licence to operate, but some fishermen occasionally act as retailers, particularly in rural markets. Retailers generally buy fish from *paikar* and *bepari* through auction, although some buy from *aratdar* on credit. The largest retailers engage daily wage labourers to assist them and may sometimes sell a portion of their fish to smaller retailers.

Retailers are found in every market, the number varying with the market's importance and with consumer traffic. The average number of *nikari* at the sample primary markets is 44, at secondary markets, 76, and tertiary markets, 58. The majority of *nikari* (67%) operate in one market, about 19% operate in two markets and 14% conduct business in more than two markets.

5.2 Degree of Involvement and Secondary Occupations of Fish Traders

Aratdar and *nikari* are full-time fish traders, but among other types of traders are many individuals who work only part time or only during the peak harvest period for *beel* and cultured ponds. Table 5.1 shows that 20% of *faria*, 25% of *bepari* and 17% of *chalani* are part-time traders. A trader's second occupation (which can be either a main or secondary source of income) is most often agriculture. The Market Survey found that only 2% of the *faria* fished as a second income source. Among the "other" occupations shown in the table are trading in fish nets, fuel wood and grain (seasonal), construction and bamboo handicrafts. The group most frequently having these occupations is the *chalani*.

Table 5.1 ***Faria, Bepari, Chalani,*** **and** ***Nikari*****: Their Involvement in Fish Trading and Secondary Occupations (percent)**

Trader Type	Involvement in Fish Trading				Secondary Occupation		
	Full Time	Part Time					
		Beel Harvest	Pond Harvest	Beel & Pond Harvest	Fishing	Agriculture	Other
Faria	80	15	0	5	2	10	8
Bepari	75	15	6	4	0	17	8
Chalani	83	17	0	0	0	0	17
Nikari	99	1	0	0	0	1	0

Source: FAP 17 Market Survey, 1993

5.3 Transaction Methods

Three transactions methods are used for the wholesale fish trade:

- auctioning through *aratdar*;
- negotiation by middlemen; and
- bargaining between the seller and the buyer.

5.3.1 Auction Method

Under the auction system, the price for an allotment of fish is fixed through open, competitive bidding. The highest bidder then takes delivery of the fish upon paying the seller. In most cases the payment is made in full and in cash. Sometimes, however, the buyer (a *bepari, paikar* or *chalani*) arranges a credit purchase through the *aratdar*, making a partial payment to the seller and taking the balance as a loan from the *aratdar*. The auction method, since it is conducted through an *aratdar*, helps ensure that the seller gets a reasonable price for his catch.

This is the way the auction process works: each morning when the baskets and crates of fish arrive at the wholesale market, the *aratdar* checks their weight and the quality of their contents. The buyers attending the auction then repay any balance owed to the *aratdar* for previous consignments. Once this is done, the *aratdar* starts the auctioning. The buyers try to secure the lowest possible price at auction to safeguard their trading interests. Since the *aratdar* work on

commission (plus *tola*), their interests dictate higher prices. Buyers wishing to buy a particular species and size of fish, have to buy at the price settled through the auction.

The auction method is practised in all the sample secondary markets and most of the primary markets.

5.3.2 Negotiation through the Middleman

The negotiation system is a closed, confidential method of fixing prices. In this system the prospective buyers of a species of fish offer their prices to the seller (fisherman or *faria*) through a middleman. This method is practised in the Pagla Bazar primary market in the North East Region and at some landing points around Chanda *beel* in the South West.

In this method of bargaining, also known as the "whispering method", the seller whispers his first price to the middleman (broker). The buyers then inspect the quantity and quality of the fish being sold, and, one by one, whisper their offering prices to the broker. After the first round of price quotation is complete, the broker negotiates with the two or three buyers offering the highest prices. Through this negotiation a price is settled; it is generally higher than the offers quoted in the first round and lower than the seller's asking price. When the negotiation is complete, the broker invites the buyer offering the highest price to take delivery of the fish on payment of cash.

The broker generally receives a commission of Tk.5-10 from the seller. If the quantity of fish is quite small, however, he may accept a smaller commission. A broker can earn Tk.100-150 per day in this manner.

5.3.3 Bargaining Method

Bargaining is the usual method of fixing a price in the retail fish trade, but it is also adopted for wholesale transactions where there are no *aratdar*. This is the case in the Char Boalia primary market in the North West Region and in Ghagar primary market in the South West.

This method fixes a price through direct bargaining between the seller and prospective buyers (*bepari, paikar or chalani*). The seller (fisherman or *faria*) asks for a price that is usually higher than his minimum selling price. The potential buyers start with a lower price. The final price, acceptable to both parties, is arrived at through several rounds of adjustments.

5.4 Social Linkages and Patronage

Fish trading, to a considerable extent, is a family business. This is particularly true among *aratdar*, many of whom inherit their position (Box 3). In some markets, family ties may even be a prerequisite for entry into the *aratdari* system. In Swarighat fish market, for instance, all the *aratdar* are lineally related. Fish traders, particularly *aratdar*, also rely extensively on their personal network of community members and people linked to them through religious and social ties.

> Abdul Majid is a co-owner of the oldest *arat* in Srimangal fish market. His family has been in the *aratdari* trade for three generations. His grandfather and his grandfather's brother established the *arat* 50 years ago. Mr. Majid's father was inducted into the *aratdari* at a young age, and he himself entered the trade in 1977 after passing his S.S.C. examination. Three of Mr. Majid's four brothers are also in the fish trade.

Box 3: *Aratdar* for Three Generations

The absence of institutional sources of financing for fishing operations and fish trading leaves an opening that other lenders have filled. Credit in the fish trade is controlled by patronage hierarchies established by the *aratdar* and *mahajan* who are the chief moneylenders in the system. The patron-client credit arrangements commonly found in the fish trade are open to exploitation and can become self-perpetuating forms of bondage between the patrons and their clients.

5.4.1 Kin and Community Relationships

Marketing agents act within a framework governed by links of patronage, kinship and credit provision. The relationships between and among the various groups of intermediaries, as well as their relationships with fishermen, determine the benefits accruing to the traders. As noted above, patronage hierarchies control the flow of credit and influence the terms of trade. Religion, residence location and family ties, separately or in combination, all influence the relationships between traders and between the traders and the fishermen. To a large extent these factors control the entry and operation of traders in particular markets.

Religion

Most traditional fishermen are low-caste Hindus, while fish traders are predominantly Muslims. Tables 5.2 and 5.3 present the Market Survey findings with regard to the religious affiliation of the traders in the sample markets. The data indicate that Muslims make up the majority of *aratdar* in all but the North Central markets, where 57% are Hindus. Among the

faria, bepari, chalani and *nikari* Muslims are a clear majority. *Faria* have the highest percentage of Hindus (34%). *Faria* are grassroots traders who work directly with fishermen, and it seems possible that the Hindu majority among fishermen might have encouraged some Hindus—including fishermen—to become *faria*. In the North Central and South West markets, a majority of the retailers are Hindu. The sample markets in these two regions are near large Hindu fishing communities, which may explain the high percentage of *jalliya* in these markets.

Table 5.2 Religious Affiliation and Residence Location of *Aratdar* by Region (percent)

Region	Religion		Residence				
			Same as Market...				Outside District
	Muslim	Hindu	Village	Union	Thana	District	
Dhaka	100	0	33	0	0	0	67
North Central	43	57	0	0	64	29	7
North East	100	0	55	18	18	9	0
North West	53	47	0	27	60	13	0
South West	63	37	37	53	10	0	0
All Regions	72	28	25	20	30	10	15

Source: FAP 17 Market Survey, 1993

Table 5.3 Religious Affiliation, Residence Location, and Operation Markets for *Faria, Bepari, Chalani* and *Nikari* (percent)

Respondent Type	Religion		Residence					Number of Operation Markets			
			Same as Market...				Outside District				
	Muslim	Hindu	Village	Union	Thana	District		1	2	3	>3
Faria	66	34	15	20	32	28	5	44	54	2	0
Bepari	75	25	4	6	31	21	38	56	25	13	6
Chalani	67	33	0	0	0	0	100	100	0	0	0
Nikari	68	32	23	35	40	1	1	68	19	10	3

Source: FAP 17 Market Survey, 1993

Residence

Where a trader lives relative to the market in which he operates can also be an important factor in trade relationships. The amount of risk involved in a credit arrangement or business transaction is closely related to a trader's knowledge about the people with whom he is

dealing. As a result, it is often to a trader's advantage to live close to the community that participates in his market.

The data in Tables 5.2 and 5.3 show that 45% of *aratdar* live within the same union where their market is located and 75% reside within the same *thana.* Only 15% of the *aratdar* have residences outside the district, but 38% of the *bepari* and all the *chalani* live in other districts.

This residence pattern underscores the importance of community relationships and local residence in the fish trade. *Faria* and *aratdar*, most of whom live close to their markets, constitute the primary channel for the collection of fish from numerous small producers. By living close to them, they can establish and maintain relationships with individual fishermen. Patrons who live near their clients can risk advancing credit without collateral, a common practice for fishing and the fish trade. Since *bepari* and *chalani* primarily export fish from lower markets to higher ones, their business contacts are mainly with *faria* and *aratdar* and residing close to the market is not a critical factor for them.

Table 5.4 reveals that *aratdar*'s family ties to their occupation are strong in the secondary and tertiary markets of all but the North Central Region. Among secondary market *aratdar,* 26% had fathers who were *aratdar* and 33% had brothers in the same trade. In the tertiary markets, 36% of the *aratdar* took over the trade from their fathers and 45% have brothers in the same trade.

Table 5.4 *Aratdar*'s Family Ties to Business and Length of Involvement by Market Type (percent)

Market Type	Family Ties		Length of Involvement		
	Father Was Aratdar	Brother Is Aratdar	1-10 Years	10-20 Years	>20 Years
Primary	10	17	69	24	7
Secondary	26	33	54	36	10
Tertiary	36	45	64	27	9
All Markets	24	32	62	29	9

Source: FAP 17 Market Survey, 1993

Aratdar in Dhaka markets have especially strong family links to their occupation: 33% inherited the business from their fathers and 67% have brothers in the same trade (Appendix A, Table 5.5). All of the *aratdar* in Swarighat market, the oldest of the city's

wholesale markets, are lineally related. In the North Central region, the opposite is true; of the present *aratdar* none had a father or brother in the *aratdari* business.

5.4.2 Patronage Hierarchies

Thousands of poor fishermen are involved in freshwater fish production, and several hundred small traders vie for small volumes of trade at every market tier. The seasonal nature of the fishing business, meagre incomes and low social status compel both fishermen and small traders to seek support from others. This creates a congenial environment for the growth of patron-client relationships. Local moneylenders (*mahajan*) and *aratdar* are the chief patrons, providing much-needed financing through a non-institutional credit network. Fishermen most commonly rely on the patronage of *mahajan*, while small traders are dependent on *aratdar*.

Fishermen also enter patron-client relationships with large-scale traders. *Bepari* acting as *mahajan*, for example, finance groups of fishermen and claim a share of their catch. One such *bepari*, a former secretary of a fishermen's cooperative in Bildahar market in the North West who lends money to fishing groups, receives 30% of the catch value as his share.

Patronage in the fish marketing network closely follows the distribution pattern of traders' sources of supply, shown in Table 5.5. *Faria* and *bepari* draw about 90% of their fish supply from fishermen; *chalani* mainly depend on *aratdar*; and *nikari* get 54-59% of their supply from *aratdar* and 31-38% from fishermen. Fishermen, as previously noted, retail about 6-8% of their fish directly to consumers.

Table 5.5 Traders' Sources of Fish Supply During Peak and Lean Periods

Trader Type	Source of Fish Supply (%)									
	Own		Fisherman		*Faria*		*Bepari*		*Aratdar*	
	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean
Faria	12	10	88	90	0	0	0	0	0	0
Bepari	0	1	89	88	3	3	1	0	7	8
Chalani	0	0	12	12	0	0	0	0	88	88
Nikari	8	6	31	38	1	1	1	1	59	54

Source: FAP 17 Market Survey, 1993

Patronage hierarchies in the fish trade are evident in the fixed trade relationship between *aratdar* and various suppliers and among the members of trader groups. The Market Survey found that 79% of *aratdar* at primary markets, 92% at secondary markets and 73% at

tertiary markets have fixed suppliers (Table 5.6). Credit was given as the reason for the fixed relationship by 74% of the *aratdar*. Mutual trust, largely based on having a good business record but also dependent on religion, local residence, social links and kinship, was cited by 22%. Kinship ties are clearly of lesser importance in fixed relationships, only 4% said kinship was the reason for fixed trade relationships.

Table 5.6 *Aratdar* with Fixed Suppliers and the Reason for the Relationship

Market Type	No. of *Aratdar*	% with Fixed Supplier	Reason for the Relationship (%)		
			Given Credit	Credit & Kinship	Mutual Trust
Primary	29	79	78	4	8
Secondary	39	92	92	4	4
Tertiary	11	73	50	0	50
All Markets	79	85	74	4	22

Source: FAP 17 Market Survey, 1993

Table 5.7 presents the same information as Table 5.6 for *faria, bepari* and *chalani*. In this case, too, a majority of the traders in all categories reported having fixed trade relationships. Mutual trust was most often named as the reason for selling to the fixed parties, credit was second and only 3% of *bepari* attributed the relationship to kinship.

Table 5.7 Number of *Faria, Bepari* and *Chalani* with Fixed Buyers and the Reason for the Relationship

Respondent Type	No. of Respondents	% with Fixed Buyers	Reason for the Relationship (%)		
			Taken Advance	Kinship	Mutual Trust
Faria	41	54	27	0	73
Bepari	48	69	36	3	61
Chalani	6	100	50	0	50

Source: FAP 17 Market Survey, 1993

5.5 Market Competition

The most widely used indicators used for judging the competitiveness of a particular marketing system are marketing margin, number of buyers and sellers at the markets and access to markets. The following section summarizes the Market Survey findings on each of these indicators.

5.5.1 Marketing Margin

Previous studies have found that marketing margins earned by fish traders, contrary to popular belief, are not excessive (see Section 2.4). Chapter 6 of this report presents evidence supporting the previous studies and indicating that traders' rates of return are modest. FAP 17 also found that fish markets are well connected, at least for the major traded species and for major trade centres.

Some cartelization occurs among *aratdar* at higher markets, but in most cases prices are determined by competitive bidding at auction. As long as prices are set in this way, there is little scope for excessive profit-taking. *Aratdar* do, however, earn high rates of interest on credit given to fishermen by charging an additional commission.

At some primary markets, as discussed in Section 5.3, prices are determined by negotiation through middlemen and at some other markets by bargaining between fishermen and traders. Where these systems are used, traders have a chance of making a higher margin if they have a strong financial position or better bargaining skills.

5.5.2 Number of Buyers and Sellers

The fish marketing system in Bangladesh has developed over the course of many years. Its numerous functionaries, through competition that weeds out inefficient traders, have kept the system reasonably efficient. The presence of large numbers of active buyers and sellers at every market tier carries with it a strong presumption of competitiveness within the system.

Badiuz-zaman Biswas, a resident of Bhanga is the sole *aratdar* in its fish market. The market is regularly attended by 50 to 60 *bepari*. In addition to his *aratdari* duties, Mr. Biswas is the market's *izaradar*, collecting tolls from both fishermen and *bepari*. He has divided his market into two sections, one for wholesaling and the other for retailing. In the retail section, fishermen and retailers pay a toll to conduct business in an exclusive corner. Mr. Biswas was also a fish exporter for some time, exporting prawns to foreign markets in collaboration with the BFDC facility in Pagla. He dropped this business after incurring recurrent losses due to poor business operations on the part of BFDC.

Box 4: An *Aratdar* with Multiple Functions

5.5.3 Entry into the Market

Buyers and sellers normally are free to enter fish markets at every level. But entry to primary markets is restricted to the extent that fishermen are tied to middlemen through credit agreements and other obligations.

Of all the various trader types, *aratdar* maintain the most exclusivity among their ranks. At some major wholesale markets existing *aratdar* restrict the entry of new competitors. For example, in Swarighat (Dhaka), as already noted, *aratdari* is restricted to the members of a particular family. In Srimangal, new *aratdar* are allowed entry only when old ones leave and they are accepted by a vote among the remaining *aratdar*.

Some *arat* are dominated by one or two individuals performing multiple functions that allow them to establish absolute control over the market (Box 4). Poysarhat primary market, for instance, has only four *arat*. Two of them are owned by Harendra Adhikari and his family. In the early 1980s, Mr. Adhikari was the only *aratdar* in the market. Mr. Adhikari advances *dadan* to fishermen and *faria* to protect his trade interests.

5.6 Women in the Fish Trade

Women rarely participate in the fish trade, even in retail markets. The Market Survey found five women retailing fish in Bildahar's primary market (Box 5), and in some areas, elderly women and minor girls were observed selling fish to villagers.

The employment of women in fish marketing is considered to be a potential growth area in the fisheries sector. Increasing women's opportunities in this area would not only provide gainful occupations for the women of fishing communities but

Subashi, a resident of Bildahar village in Chamari union, Singra thana, is the head of a household consisting of a son, his wife and their two children. Subashi was born and raised in a fishing community, Bildahia village, in the Chalan *beel* area and she was married to a Bildahar fisherman and *nikari*. When her husband died 18 years ago, she took over her husband's business with the support of fellow *nikari*. She earns a daily average of Tk.25 during the peak season and Tk.15 during the lean period. According to Subashi, dwindling fisheries resource and increasing restrictions on fishing access have driven many fishing families to begging for a living. To her knowledge, 15-20 women in her community are beggars.

Box 5: Subashi; a Female *Nikari*

also free up male labour for other fisheries activities.

Women have demonstrated their skill as fish traders in other developing countries. In 1990, for example, a fish market run exclusively by female fish vendors went into operation in Besant Nagar, Madras. This market was established with the assistance of the Bay of Bengal Programme for Fisheries Development (BOBP). BOBP, jointly sponsored by several donor countries and executed by FAO, is a regional fisheries programme covering seven countries around the Bay of Bengal. The model emphasizes the growth of a group using a participatory approach. Although the social setting in Bangladesh is different from that of Madras, the experiences of the model deserve serious consideration.

6.1 Introduction

The flow of trade is critically dependent on financing to meet short-term working capital needs, as well as on returns to capital. Institutional lenders, however, are widely known to be wary of making loans to traders, especially small-scale ones. Petty traders therefore must rely on informal credit sources to sustain their businesses. The availability of credit, regardless of its source, clearly would be influenced by the nature of traders' returns. Low, risky returns, for instance, are unlikely to generate the confidence needed to access credit.

The returns traders can get on their capital investments are of interest on their own. It is frequently alleged that the fish trade exacts excessive profits and that the fish marketing system has severe imperfections. This accusation of excessive profits is not borne out in the existing literature nor, as this chapter will show, by this study. Data on buying and selling prices, costs of labour, storage, packing, transport, etc. are available for a number of regional markets and for different market levels. It should be noted, however, that these data have some major drawbacks: (a) they relate to a particular point in time (day) and (b) sample sizes per trader type are too small to confidently allow broad generalizations. Longer-term, large-scale study of these issues should be undertaken.

6.2 Trade Finance

Traders need a regular flow of working capital to enable them to continuously buy and sell. The period during which working capital is tied up, for which a voucher called a *chalan* is issued, differs from trader to trader, depending on the scale and volume of their transactions, but generally they range from one to three days.

Overall, *bepari* report holding *chalan* worth an average of Tk.6,000. About half of this is credit financed, the rest comes from their own resources. *Faria* use considerably less capital (about Tk.1,600 on average), much of which is self-financed.

When the data are disaggregated (Table 6.1), considerable variations are evident by region and trader type. Traders in all market tiers of the North East, for example, have much more capital invested than those in other regions. *Bepari* in Dhaka secondary markets report

working capital of Tk.19,667 per *chalan*, while *chalani* in the same market report only Tk.8,000. *Bepari* rely more heavily on credit for their capital, 64% of which is borrowed. Among *chalani* credit finances only 31 percent. In the North Central Region, *bepari* report average *chalan* worth Tk.1,250 in secondary markets and Tk.3,000 in tertiary ones, amounts that they finance entirely on their own. Primary and secondary market *faria*, largely although not entirely self-financed, operate smaller *chalan* (averaging Tk.2,656 and Tk.1,000, respectively).

Table 6.1 Volume and Source of Financing for Fish Traders by Market Type and Region

Region	Trader Type	Tk./Chalan	Source of Financing		
			Own	Partner	Credit
PRIMARY MARKET					
North Central	*Faria*	2,655	2,111		544
North East	*Faria*	2,800	2,455		345
North West	*Faria*	1,200	640	200	360
North West	*Bepari*	1,833	1,500		333
South West	*Faria*	517	517		
SECONDARY MARKET					
Dhaka	*Bepari*	19,667	9,000		10,667
Dhaka	*Chalani*	8,000	5,500		2,500
North Central	*Faria*	1,000	1,000		
North Central	*Bepari*	1,250	1,250		
North East	*Bepari*	20,000	5,000		15,000
North West	*Faria*	1,200	1,200		
North West	*Bepari*	2,000	1,000		1,000
South West	*Bepari*	1,813	1,813		
TERTIARY MARKET					
North Central	*Bepari*	3,000	3,000		
North East	*Bepari*	4,000	2,667		1,333
North West	*Bepari*	2,566	2,233	333	
South West	*Faria*	1,733	1,733		

Source: FAP 17 Market Survey, 1993

A somewhat larger sample is available for *bepari* and *faria* in the North East. Primary market *faria* report *chalan* worth Tk.2,800, secondary market *bepari* report *chalan* of Tk.20,000 and tertiary market *bepari*, Tk.4,000. The *faria* have very limited access to credit

(only 12% of working capital is credit financed), while *bepari* enjoy much wider access (33% in tertiary markets and 75% in secondary ones).

The overall pattern of working capital requirement for *faria* and *bepari* also holds true in the North West, with *faria* typically needing a smaller capital base, usually self-financed, while *bepari* need larger amounts, a sizeable portion of which is credit-financed. The sample traders in the South West appear to be starved of credit; all of their financing came from their own resources.

A separate survey of *aratdar* (Table 6.2) also highlights the generally low dependence on credit for working capital. Interviews with *aratdar* found that only 5-10% of capital requirements are credit financed and a similar amount is financed by a partner. The major share of the funds originate with the trader himself. Table 6.2 also indicates that banks provide little of the credit financing. The majority of the credit comes from *mahajan* or friends and relatives.

Table 6.2 *Aratdar*'s Financing Sources by Market Type (taka)

Market Type	Financing Source						
	Own	Partner	Credit	Bank	*Mahajan*	Coop	Relative /Friend
Primary	43,648	10,379	7,552	621	5,621	-	2,172
Secondary	252,141	1,538	11,051	1,282	4,872	-	4,897
Tertiary	49,545	-	-	-	-	-	-

Source: FAP 17 Market Survey, 1993

6.3 Return to Capital

Traders' returns and the question of monopoly profits are frequent and recurrent subjects of debate in the literature on fish marketing, but little hard data exists to support any position on these topics. The Market Survey gathered some data on traders' costs and returns. These data, which include prices received and paid and volumes transacted, have been used to identify and quantify the costs involved in the process of buying and selling fish during a single trading day. Fishermen (who, strictly speaking, are not traders) were also included in this sample. For them, returns reflect their earnings per day over costs (excluding the cost of their own labour or the cost of the equipment used). These data are presented Appendix A, Tables 6.1-6.4 and are summarized in Table 6.3.

Table 6.3 Fish Traders' Costs and Returns by Market Type

Trader Type	No. of Respondents	Marketing Costs	Buying Price	Total Costs	Selling Price	Return/ Trader	Percent
PRIMARY MARKET							
Fisherman	59	1,787	-	1,787	30,026	479	-
Faria	39	1,589	26,300	27,889	31,838	101	14.3
Bepari	7	244	3,916	4,160	3,881	-40	-
Nikari	32	428	17,595	18,023	20,859	89	15.7
SECONDARY MARKET							
Fisherman	30	1,983	-	1,983	29,355	912	-
Faria	4	109	1,188	1,297	1,446	37	11.5
Bepari	24	1,791	27,088	28,879	32,652	157	13.1
Nikari	30	450	27,563	28,013	32,930	164	17.6
TERTIARY MARKET							
Fisherman	12	533	-	533	9,374	737	-
Bepari	12	984	19,286	20,270	23,772	292	17.3
Nikari	11	332	32,948	33,280	41,592	756	25

Source: FAP 17 Market Survey, 1993

The range of returns obtained by fishermen is large: Tk.500-900 per day, depending on the level of the market. For *faria*, net returns range from 11.5% in secondary markets to 14.3% in primary ones. *Bepari*'s returns are negative in primary markets, 13.1% in secondary markets and 17.3% in tertiary markets. *Nikari* register uniformly high returns, from 15.7% to 25%.

Variations across market tiers are considerable, as are those across regions. *Nikari* in the North West report relatively low returns (8.7-14%), while *faria* out-perform *bepari* in the secondary markets. *Bepari*'s returns are also low in the South West, even in tertiary markets.

Clearly these estimated margins do not appear excessive, and rates of return seem modest, despite the existence of considerable variation both among traders and across regions. In other words, there is no apparent evidence of monopoly profits in the data gathered by the Market Survey.

PRICE TRENDS AND MARKET PERFORMANCE

7.1 Introduction

As reported in Chapter 1, per capita fish consumption has apparently declined since the 1960s. The factors popularly held responsible for this are population pressure and a dwindling fish resource base, leading to high prices. This chapter explores what has happened to real fish prices over the years.

Several available sets of price data are used for this exercise. The Directorate of Agricultural Marketing (DAM) collects price data for major fish species from a large number of wholesale centres across the country. The Bangladesh Bureau of Statistics (BBS) publishes monthly retail price data for major species in seven key centres. The third data set, available from the Directorate of Fisheries, gives producer price data for the period 1985-92. This chapter evaluates all the available data to see if a consistent and clear picture emerges. A second line of enquiry is also pursued. This exercise evaluates fish market performance through market integration tests.

7.2 Price Trends

7.2.1 Aggregate Wholesale Prices (DAM)

Nominal fish prices rose steadily between 1975 and 1991 for all reported species in the DAM statistics, with *rui* and *katla* registering the sharpest rise (Figure 7.1). Inflation-adjusted (real) prices[6] for *ilish* reveal no trend, despite considerable year-to-year variations (Figure 7.2). Real prices for *rui* and *katla* (Figure 7.3) follow each other very closely and seem to register a significant upward trend over the period. There is a sudden price jump around 1984, however, so if the periods prior to 1984 and after 1985 are considered separately, this upward trend disappears.[7] The same is also true of *puti* (Figure 7.4).

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[6] Nominal prices deflated by the Consumer Price Index for Middle Income Families in Dhaka, published by the BBS.

[7] The reason for this price shift is unknown.

Figure 7.1 Wholesale Fish Prices, 1975-91 (unadjusted)

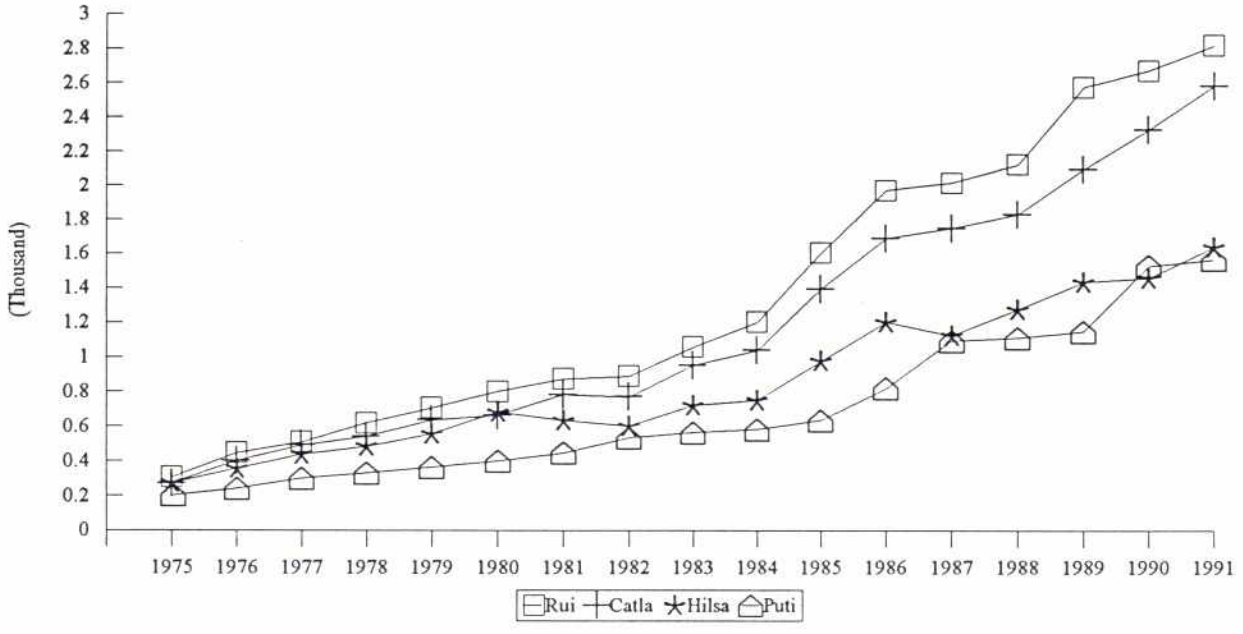
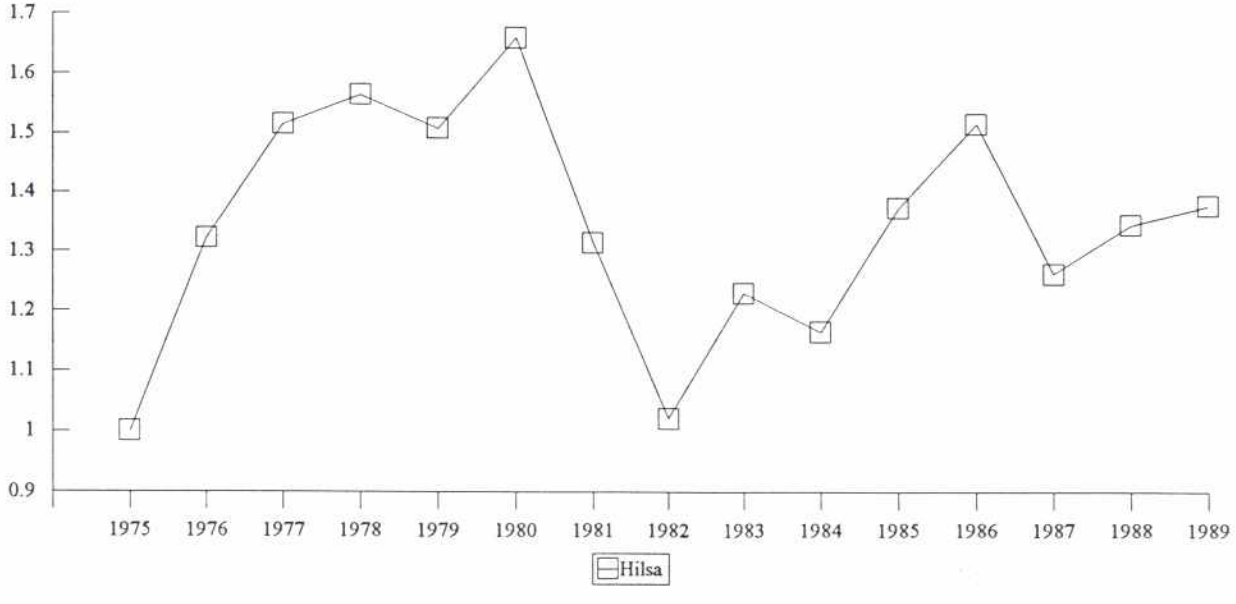


Figure 7.2 Inflation Adjusted Price of Hilsa



Source: DAM

Figure 7.3 Inflation Adjusted Price of Rui and Catla

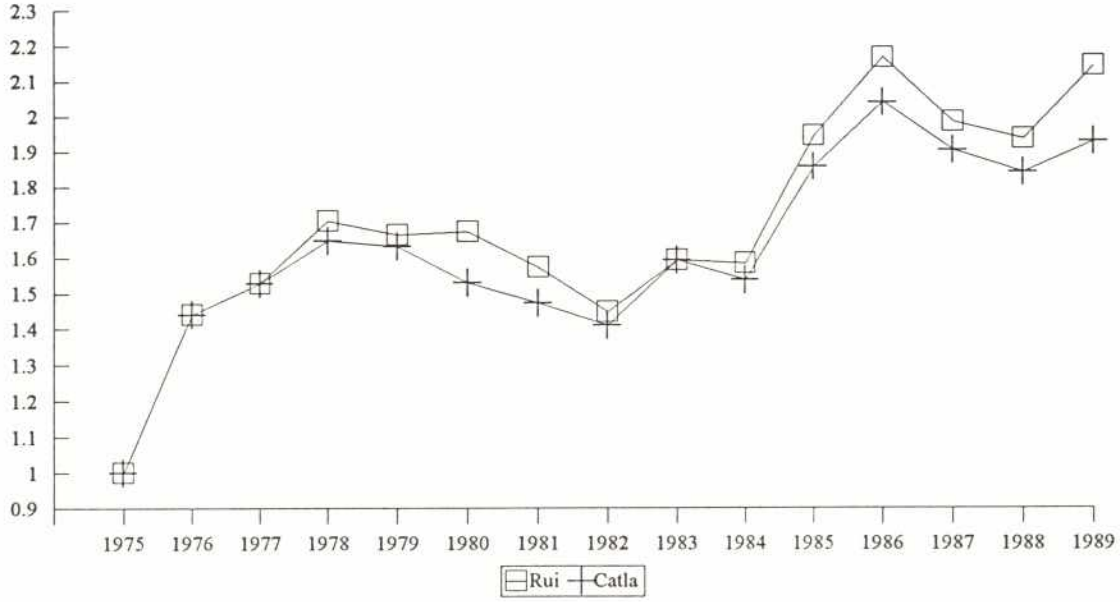
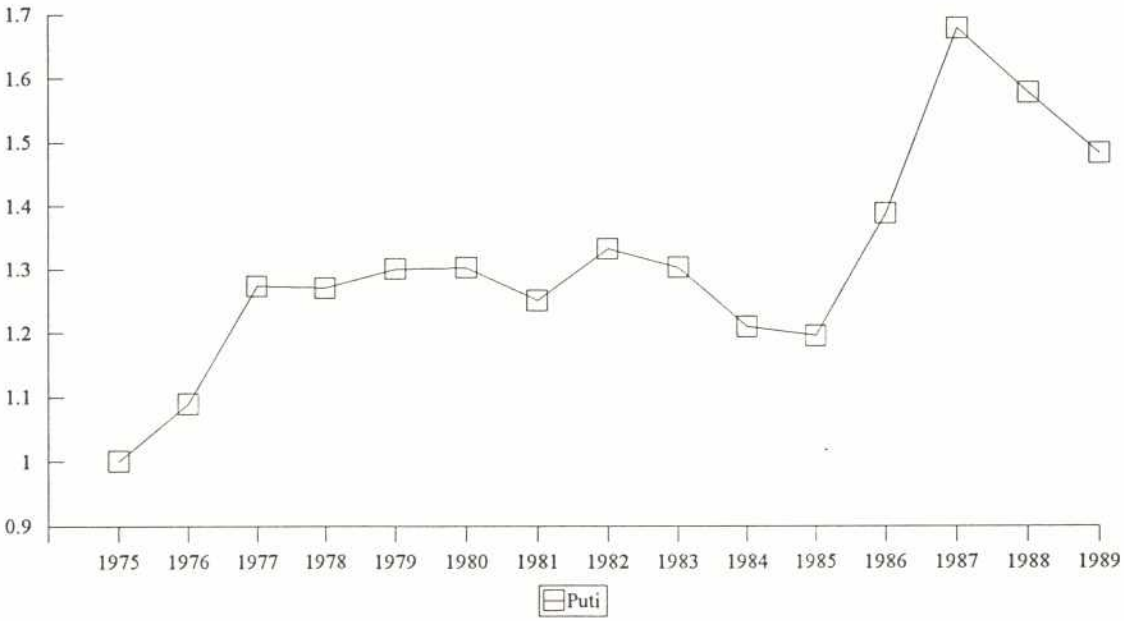


Figure 7.4 Inflation Adjusted Price of Puti



Source: DAM

Table 7.1 summarizes the estimated growth rate trends. While nominal prices have registered quite sharp growth rates (5.8% for *rui*, 4.6% for *ilish*), the trend in real prices is weak. It is likely, in fact, that the trend in real prices would disappear entirely if a dummy variable was used to account for the unusual price jump of 1984.

Table 7.1 Growth Rate Trends for Fish Prices, 1975-91 (percent)

Species	Nominal Price	Real Price
Rui	5.8	1.5
Katla	5.6	1.3
Ilish	4.6	0.038
Puti	5.5	0.97

Source: Based on DAM data

7.2.2 Disaggregated Wholesale Prices (DAM)

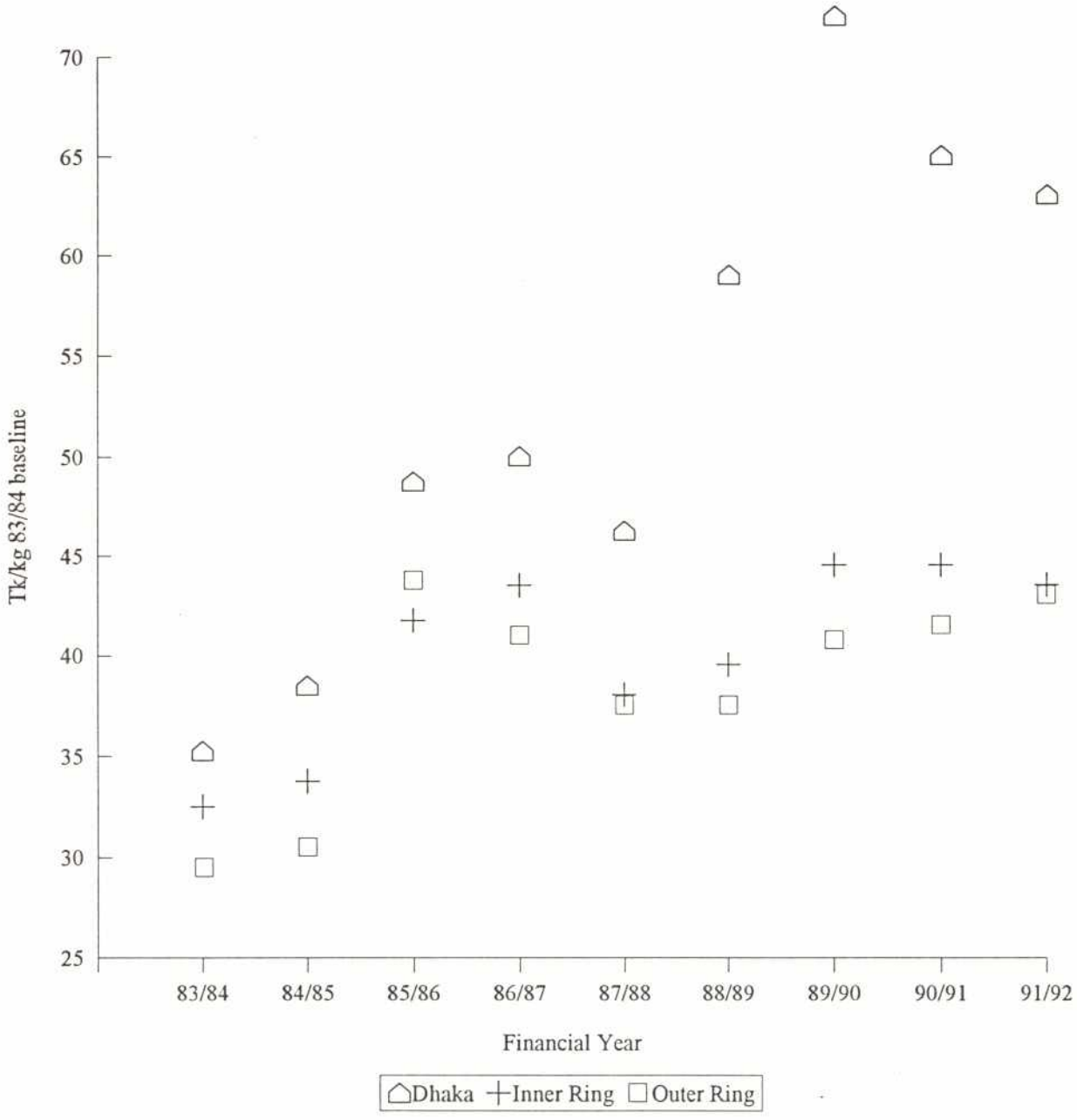
Since the trends apparent in the aggregated national data may also occur in the disaggregated data, the DAM wholesale markets were divided into three groups: Dhaka, Inner Ring (i.e., those close to Dhaka) and Outer Ring. Although this classification is arbitrary, it serves to point out geographical differences in price behaviour.

While there is little evidence of a real price trend for rui in Outer Ring areas, Dhaka prices increased considerably between 1985 and 1992 (Figure 7.5). The same appears to be true for *ilish* (Figure 7.6), although the Dhaka price trend is less clearly marked. None of the areas exhibit a notable price trend for *koi* (Figure 7.7). The disaggregated picture, therefore, shows that the price behaviour observed in the aggregated data, especially for major carps like *rui*, is retained—with the exception of prices in the Dhaka market.

7.2.3 BFRSS Producer Price Data

Figures 7.8, 7.9 and 7.10 graphically present the nominal and real prices producers received for major carps, minor carps and catfish. In all three cases real prices have remained virtually static over the period 1985-92. Even nominal prices appear to be very sluggish.

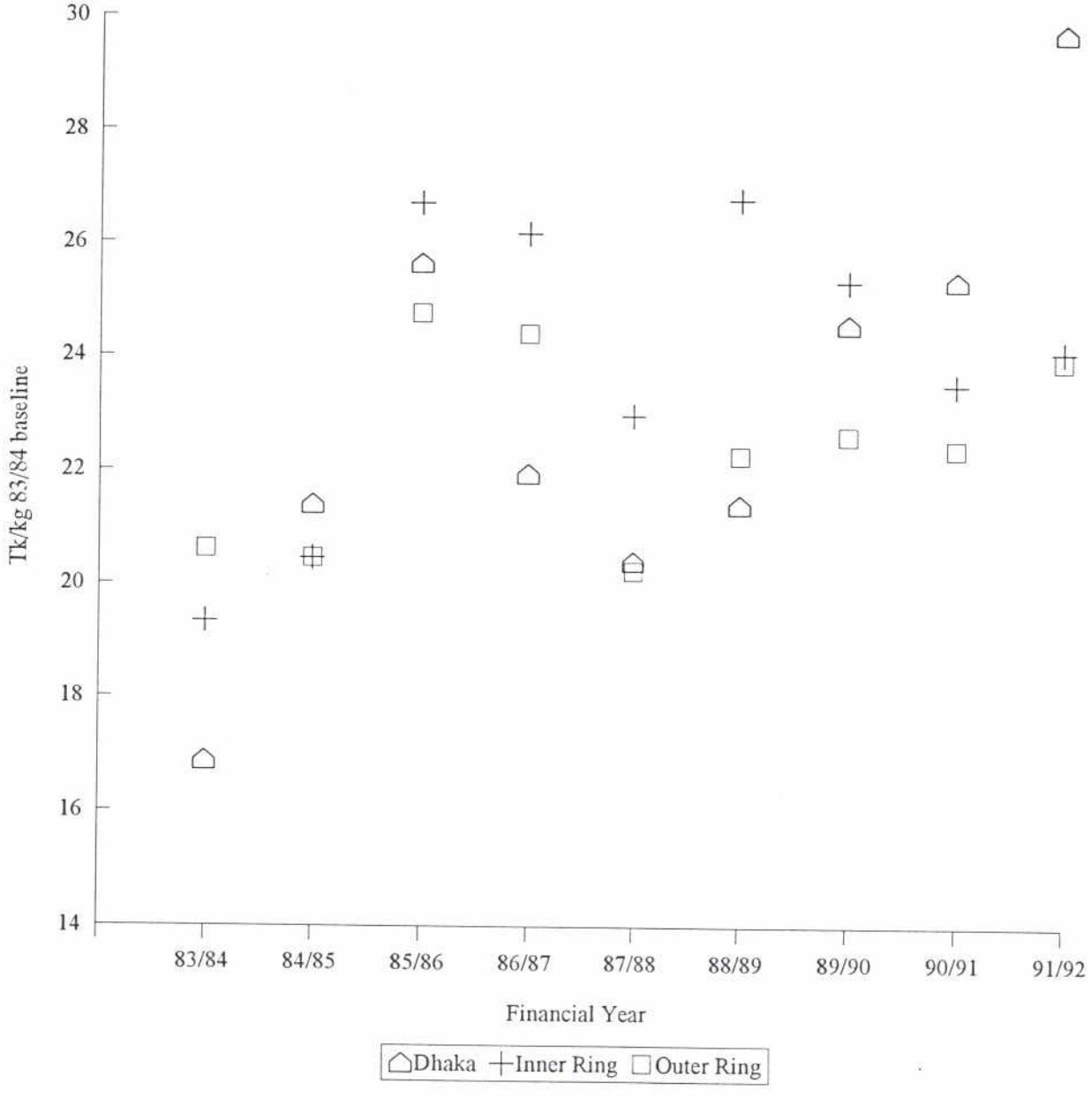
Figure 7.5 Real Market Price by Area: Rui



Source: DAM

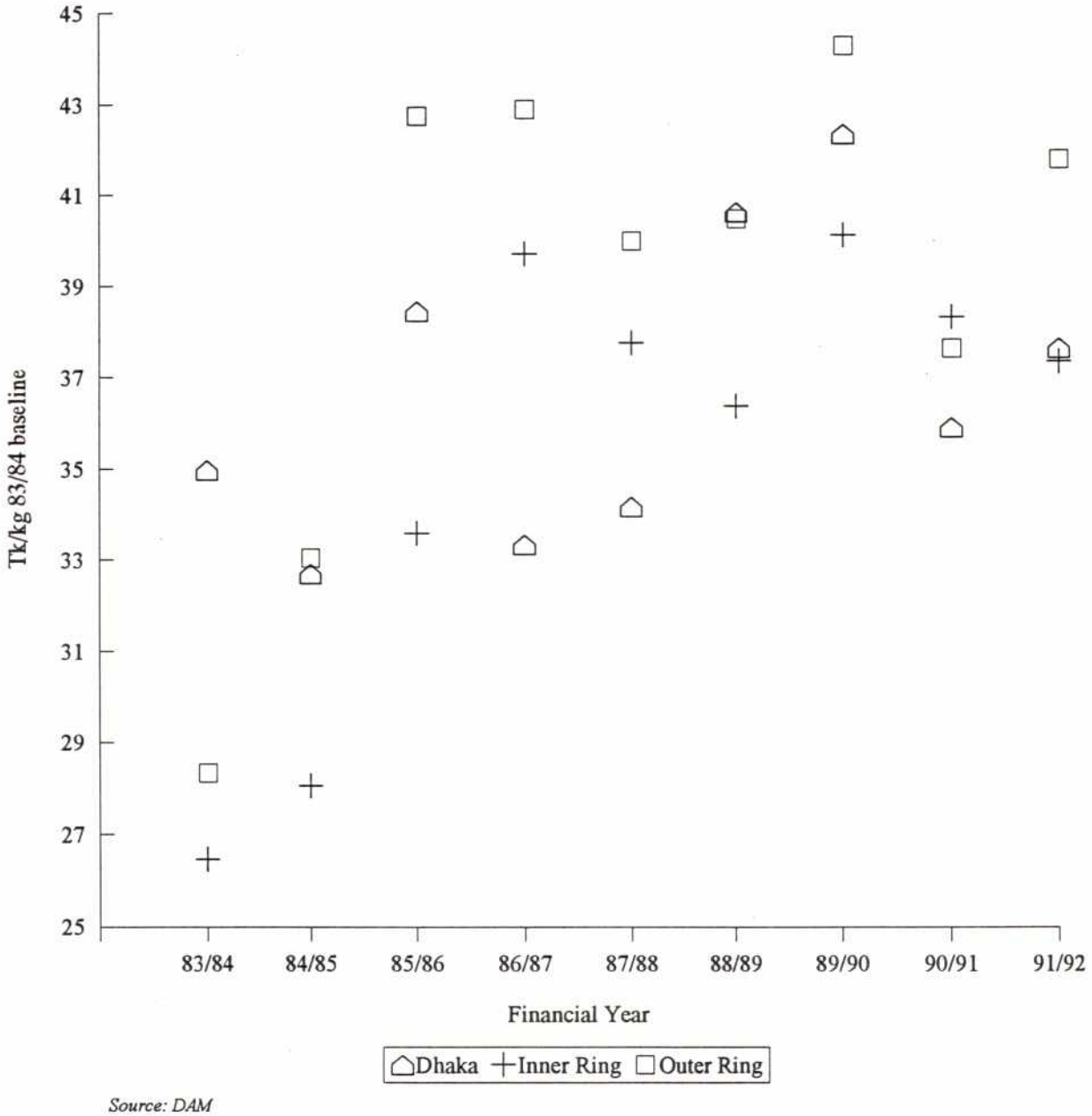
20

Figure 7.6 Real Market Price by Area: Hilsa



Source: DAM

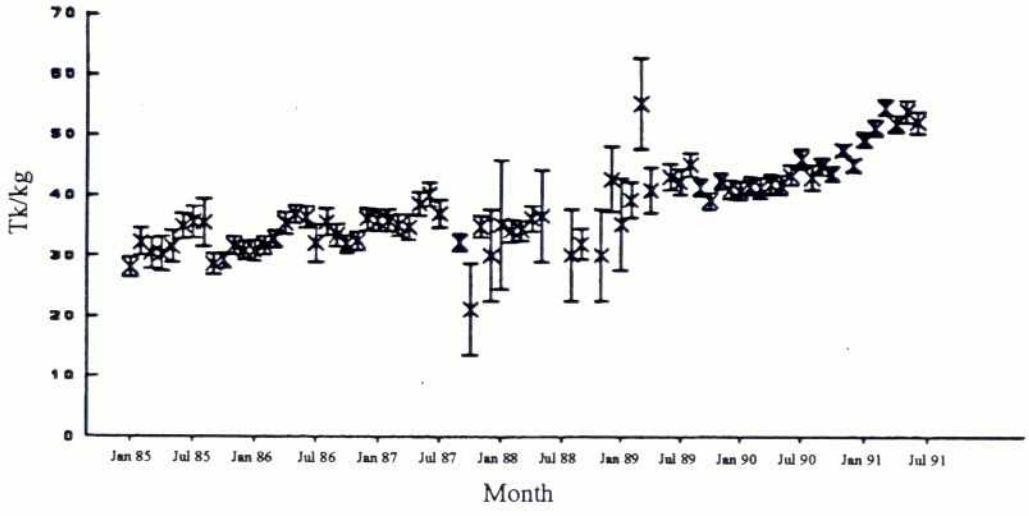
Figure 7.7 Real Market Price by Area: Koi



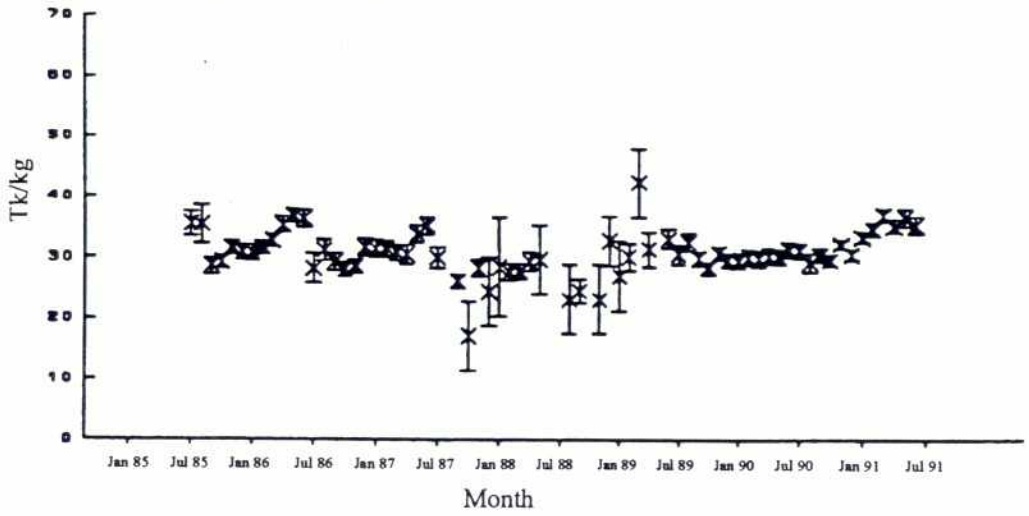
Source: DAM

Figure 7.8 Prices for Major Carp

a) Actual Price

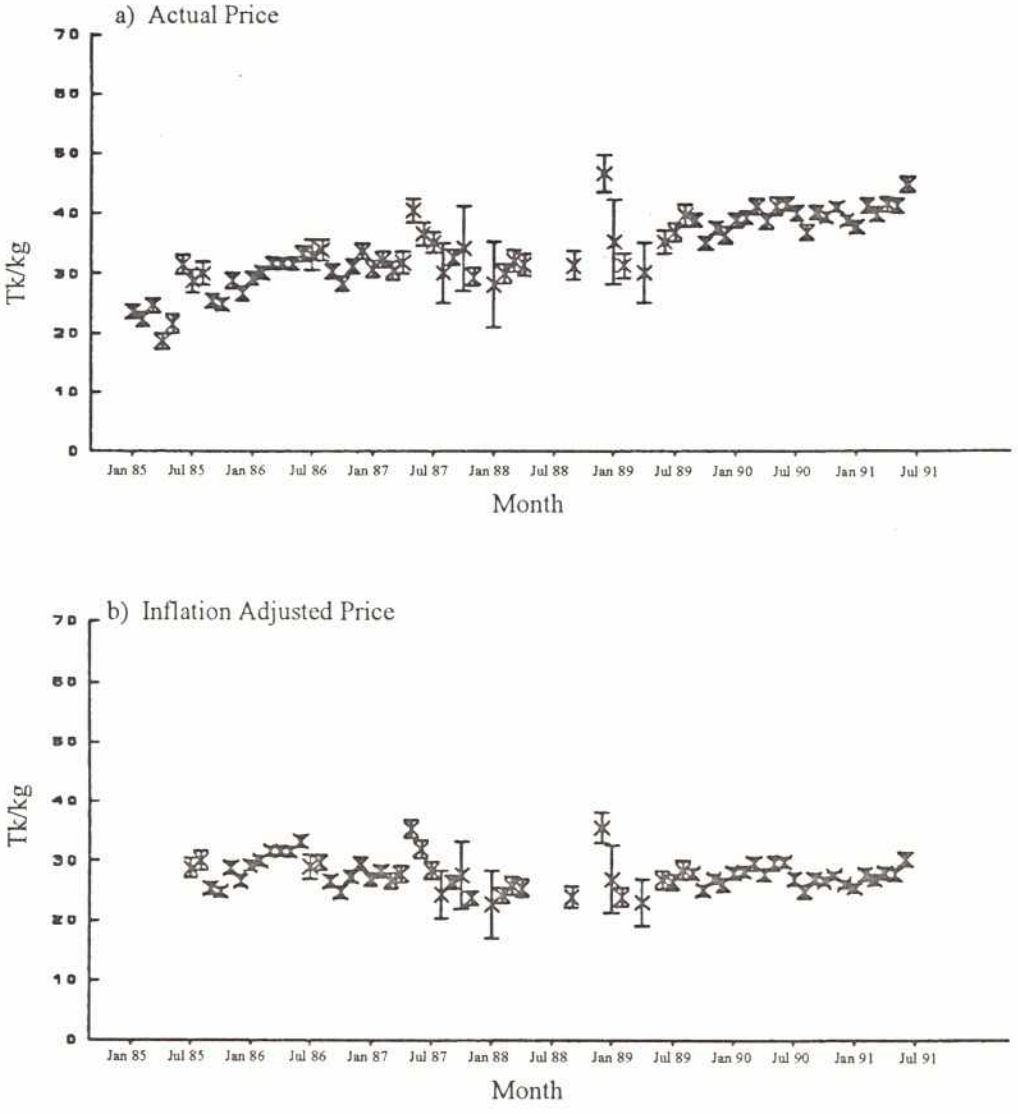


b) Inflation Adjusted Price



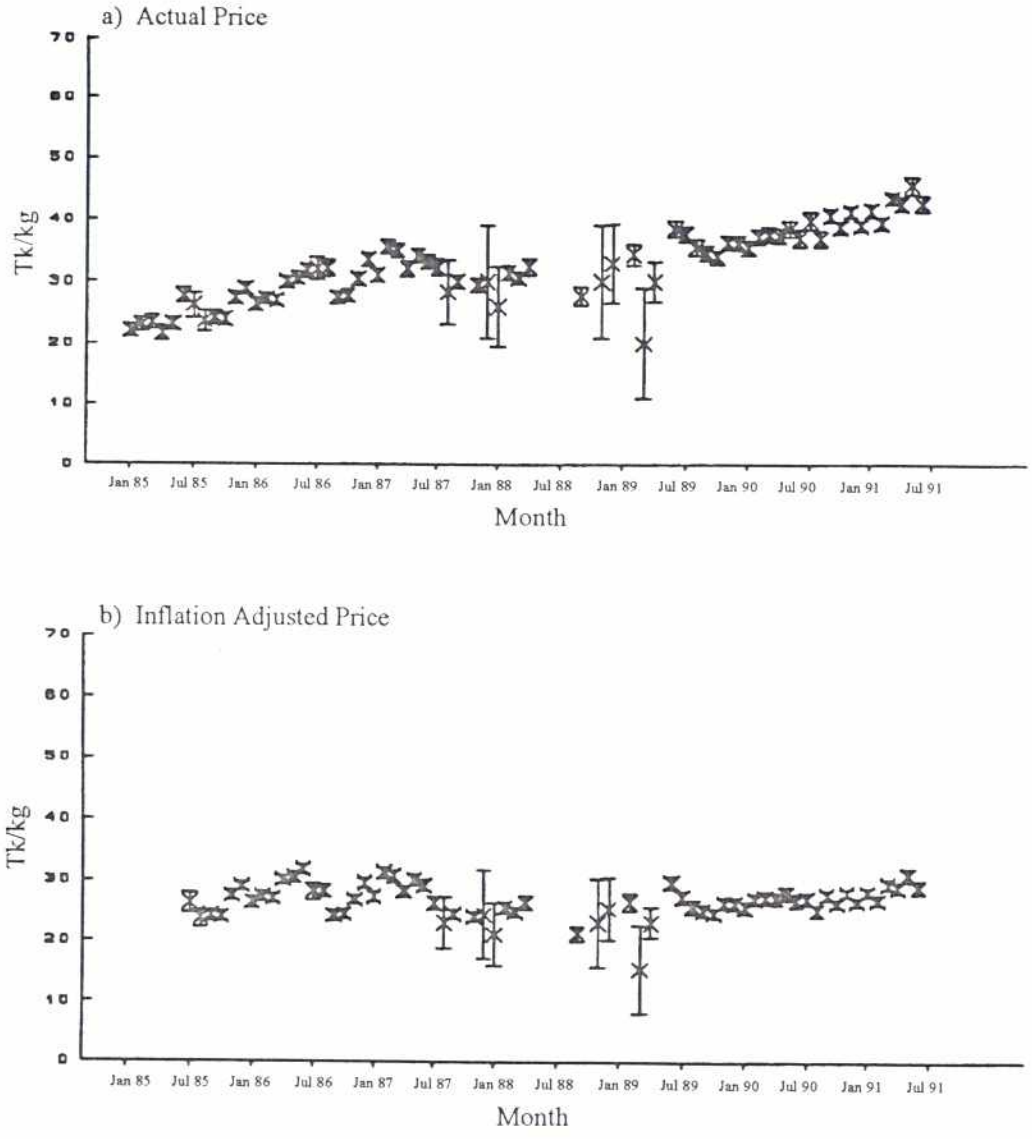
Source: FRSS data

Figure 7.9 Prices for Minor Carp



Source: FRSS data

Figure 7.10 Prices for Catfish



Source: FRSS data

7.2.4 BBS Retail Price Data

A more rigorous test for the existence of a real price trend by species and centre was conducted using the BBS monthly retail price data. Nominal prices for each of the seven centres (Dhaka, Chittagong, Sylhet, Khulna, Rajshahi, Rangpur and Narayanganj) were first converted into real prices by deflating them with the Wholesale Price Index (agriculture); these prices were then deseasonalized. The seasonally adjusted series was tested for annual trend using regression techniques, with a dummy variable incorporated to take into account the 1984 price jump. The coefficients of "trend" and "dummy" for *rui* (along with their "t" statistics) are shown in Table 7.2.

Table 7.2 Retail Real Price Trends for *Rui*; 1975-92

Area	Trend	Dummy
Dhaka	.27* (8.2)	-.15 (.54)
Khulna	.20* (5.7)	-.18 (.59)
Narayanganj	.138* (3.44)	1.17* (3.38)
Rajshahi	.06 (1.25)	1.5* (3.74)
Rangpur	.25* (7.24)	.34 (1.14)
Sylhet	-.045* (6.18)	-.11 (1.8)
Chittagong	.091* (2.87)	.65* (2.4)

Source: Based on BBS data
Note: Figures in parentheses are "t" statistics.
*Significant at the 5% level.

A similar exercise was conducted for *ilish, koi, shingi, chingri* and *puti*. The values of the trend coefficients are reproduced in Table 7.3.

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Table 7.3 Retail Real Price Growth Rate Trends; 1985-92

Area	*Rui*	*Ilish*	*Koi*	*Shingi*	*Chingri*	*Puti*
Dhaka	.039*	.030*	.014*	.027*	-.048*	.057*
Chittagong	neg.	.019	-.062*	-.063*	.122*	-.005
Khulna	.019	.020*	.040*	.030*	-.009	.045*
Narayanganj	.018*	-.004	.016*	.054*	.047*	.056*
Rajshahi	.035*	.009	.015	.012	-.004	-.023
Rangpur	-.061*	.007	-	-	-	-
Sylhet	-.001	-.04*	.041*	.008	-.068*	.015

Source: Estimates based on BBS monthly retail price data
Note: Coefficients were estimated by fitting semi-log trends, so that these are also growth rates.
*Significant at the 5% level.

The growth rates in Table 7.3 present a complex and very mixed picture, with a great deal of variation by species and centre. At one extreme, Dhaka has experienced significant price increases in retail price level over the 1985-92 period. At the other, Sylhet prices, with the exception of *koi* show little evidence of a trend. It should also be noted that some centres report significant negative trends, such as Chittagong, where *koi* and *shingi* prices declined, and Sylhet, where *ilish* prices dropped.

The BFRSS data showed little evidence of a trend, while the DAM wholesale data suggest a distinct upward trend in Dhaka prices, especially for *rui*, but no trend for the Inner and Outer rings nor as clearly for other species.

The BFRSS data on producer prices and the DAM data (aggregated and disaggregated) coincide with the period to which the data in Table 7.3 refer. The overall impression from these data is that producer prices have stagnated over the period, while according to the BBS data retail prices have moved up quite sharply in some centres and for a some species.

The disaggregated DAM data seem to fall somewhere in between, with a significant time trend in Dhaka prices, especially for *rui*. This suggests that producer, wholesale and retail prices have tended to behave quite differently from each other, possibly reflecting informational and risk imperfections in the market.

The behaviour of retail price data for the entire 1975-92 period was also studied in order to compare it with the aggregated (national) data on wholesale prices (Table 7.1). The data for this longer period, shown in Table 7.4, reveal a significant time trend, often quite large, in real prices for *rui*. For most other species, a number of markets (although not all) show a significant trend, some even having a negative trend. Despite the mixed picture, the overall impression is that retail prices have risen significantly. This is not well supported by wholesale price movements, however, which rose only weakly over the same period.

Table 7.4 Retail Real Price Growth Rate Trends; 1975-92

Area	*Rui*	*Ilish*	*Koi*	*Shingi*	*Chingri*	*Puti*
Dhaka	.039*	.012*	.024*	.040*	.050*	.029*
Chittagong	.013*	-.003	-.018	.021*	.097*	.025*
Khulna	.017*	.005	.010	.023*	.013	.025*
Narayanganj	.029*	.005	.020*	.044*	.039*	.026*
Rajshahi	.043*	-.009	.025*	.020*	.035*	-1.2
Rangpur	.067*	-	-	-	-	-
Sylhet	.019*	-.030*	.017*	.026*	.003	.041*

Source: Estimates based on BBS monthly retail price data
Note: Coefficients were estimated by fitting semi-log trends, so that these are also growth rates.
*Significant at the 5% level.

In the Dhaka-Narayanganj area, all species, except *ilish*, exhibit quite significant price increases. In Chittagong, *ilish* and *koi* prices show no trend, while *rui* prices show a weak upward trend. In Khulna, most prices show little or no trend, except for *shingi* and *puti*, which have grown at a rate of over 2%. *Ilish* and *puti* exhibit little trend in Rajshahi, while the real prices of other species registered quite significant growth rates. Unaccountably, *ilish* real prices in Sylhet have declined and *chingri* prices have stagnated, while all other prices, particularly those for *shingi* and *puti*, show significant increases.

A number of conclusions can be drawn from the preceding review of the existing data. First, there are considerable differences in the behaviour of producer, wholesale and retail real prices. Producer prices appear to have virtually stagnated for all varieties of fish over the period 1985-92. The disaggregated DAM prices for the corresponding period broadly corroborate this result for areas outside Dhaka. Dhaka prices, however, tend to show a strong upward trend, especially for *rui*. Retail prices, on the other hand, show very significant growth rates in Dhaka and Khulna (for all species in Dhaka and four out of six species in Khulna), while only *rui* prices in Rajshahi and

koi prices in Sylhet show strong growth trends. In all other cases the estimated trends estimated are either weak or negative.

Second, a comparison of retail, wholesale and producer price data for the entire period (1975-92) suggests that retail prices have risen sharply, while producer prices have stagnated and wholesale prices have straddled the middle ground. (*Ilish* prices are an exception, having stagnated at each of the three levels.) There would thus appear to be support for arguing that fish markets lack vertical integration, the subject of the next section of this chapter.

7.3 Fish Market Integration

Analysing the price of a given commodity across markets can provide useful insight into the geographic flow of information and the efficiency of commodity markets. Ravallion (1986), for example, has used a dynamic market integration model to show that rice market efficiency in Bangladesh varies seasonally and between famine and non-famine periods.

Two regions are said to be in the same economic market (i.e., integrated) for a homogenous commodity if the prices for that commodity differ by exactly the interregional transport cost When markets are not integrated it means that (a) the regions are not linked by arbitrage, i.e., they are independent markets; (b) there are constraints to efficient arbitrage, e.g., trade barriers, imperfect information or risk aversion; or (c) there is imperfect competition in one or more of the markets.

Understanding geographical arbitrage and market efficiency is essential to understanding fish markets, which generally are considered highly imperfect, very risky and subject to producer exploitation by large traders and moneylenders. FAP 17 (Murshid 1993) previously reported some evidence to suggest that vertical integration in fish markets is weak, with producer prices remaining stagnant even in the face of rising wholesale and retail prices.

The geographical and horizontal integration of fish markets has been given only cursory study. Rahman (1992) tested such integration using correlations in first differences of prices in various markets. Methodologies for integration testing have gone far beyond measuring the bivariate correlations of detrended price series, however (the use of first differences is one way of detrending data, albeit in a mechanistic manner). This study therefore seeks to more rigorously evaluate the extent of fish market integration. The availability of recent evidence from the rice market will also permit an interesting comparison.

7.3.1 Methodology for Analysis of Market Integration

Analyses of market integration based on bivariate correlations provide only limited information (Harriss 1979). Such analyses can yield erroneous conclusions when two functionally separate markets appear to exhibit price synchronization when, in fact, each is being influenced by a third market or by a common variable (e.g., the inflation rate). A number of methodological improvements have been suggested in the literature to overcome this problem. Delgado (1986), for example, used a variance components model that permits a joint test of seasonal differences in the price integration of markets. Ravallion (1986), primarily concerned with the dynamic structure of integration, made a distinction between short- and long-run integration. Contributions made by Goodwin and Schroeder (1991) and Goodwin, et al. (1990) are of a similar sort. Goodwin and Schroeder pointed out that interregional trade takes time to arrange and complete, because of delivery lags, so trade between regions is based on expectations of future market conditions. This means that even if markets are not integrated in the short run, they could be in the long run. Timmer (1987) and Heytens (1986) modified Ravallion's model, providing intuitive interpretations of a subset of the model's parameters at a cost in terms of simplification of the original dynamic structure. Faminow and Benson (1990) provided an important reinterpretation of the Ravallion model, building upon Hotelling's model of locational interdependence (which can be thought of as spatial oligopoly). They observed that short-run integration may be generated by collusive base-point pricing rather than by competition, although rejection of short-run integration and acceptance of long-run integration is compatible with market competition.

In this investigation of fish market integration the Ravallion model and the modifications proposed by Timmer and Heytens have been used. The Ravallion model is based on the notion of a central market price (also known as the reference market price and denoted by superscript 1), which is a function of prices in a number of (n-1) markets, as well as a vector of seasonal and policy variables (X).

$$P^1 = f^1 (P^2, P^3, ..., P^n, X) \qquad (1)$$

Prices in each of the (n-1) markets are functions of those in the central market:

$$P^i = f^i (P^1, X) \qquad (i = 2, ..., n) \qquad (2)$$

The above formulation implies a radial market structure in which prices in the central market affect all other markets. The dynamic structure of this model is as follows:

$$P^i_1 = \Sigma^1_{j=1}\alpha^i_j P^i_{t-j} + \Sigma^1_{j=0}\beta^i_j P^1_{t-j} + \delta^i X^i_1 + \mu^i_t \qquad (3)$$

If $\beta = 0$ for all values of j, then the *i*th market is segmented from the central market. If $\beta_0 = 1$, however, then prices are immediately transmitted; in the case of long-run integration, $\alpha+\beta = 1$.

Although various hypotheses about market efficiency can be tested using this model, it does not provide a ready summary statistic about the degree of integration between polar cases. Timmer (1987) and Heytens (1986) have suggested modifications to remedy this drawback. First, prices are converted to logarithms, implying *ad valorem* costs rather than a fixed fee per unit of quantity, and second, a single lag structure is used to explain price formation, rather than the six used by Ravallion. This allows the temporal change in a peripheral market to be explained by the influence of the local market price (lagged one period) and central market prices (current and lagged one period).

Timmer-Heytens Modifications

$$P^{it} = (1 + b_1)P^i_{t-1} + b_2(P^1_t - P^1_{t-1}) + (b_3 - b_1)P^1_{t-1} + \delta X + \mu^i_t \qquad (4)$$

where:
$b_1 = \alpha^i-1$
$b_2 = \beta^i_0$
$b_3 = \alpha^i+\beta^i_0+\beta^i_{1-1}$

If it is assumed that $\delta = 0$, then the ratio of $(1+b_1)/(b_3-b_1)$ is the relationship between the influence of the local market and the central market in determining the price history of the peripheral market. Timmer calls this the intensity of market connectedness (IMC). Short-run integration is implied by an IMC of less than 1.

7.3.2 Data and Estimation

The data used in this exercise are the available retail fish prices for six major urban centres: Dhaka, Chittagong, Sylhet, Khulna, Rajshahi and Rangpur. Although data are available for a number of species, only those for *rui* and *ilish* have been used. Both species, but especially *ilish*, are very heavily traded, so their spatial price distribution across the urban centres could be expected to be similar, suggesting strong market integration.

The basic Ravallion model (equation 3) was used to test for market segmentation using *rui* retail prices. In this estimation, Dhaka was treated as the central market for Chittagong, Sylhet and Khulna, and Khulna was assumed to be the central market for Rajshahi and Rangpur. These assumptions are not totally arbitrary but, rather, are based on the direction of trade flows for the major traded species (see Coulter & Disney 1987, pr.13). An attempt was also made to ascertain the direction of causality between markets, especially between Dhaka, Chittagong and Khulna, to determine whether the markets could be radially configured.

Rather than directly using central market prices, instrumented prices were used to avoid problems of correlation with the error term (see Goleti 1993, p. 57). Central market instrumented (predicted) prices were based on the lagged values of prices for all the markets in the study.

The final integration tests used the Timmer-Heytens modifications discussed above on the data for *rui* and *ilish.*

7.3.3 Findings

The test for market segmentation, applying equation 3 to *rui* prices, used the F test to assay whether the equation is significantly different from its restricted version in which the central market terms have been dropped. The relevant data are presented in Table 7.5. F_{change} was significant for all but the Chittagong market, suggesting that the Dhaka and Chittagong markets are segmented. For Rajshahi, F_{change} was significant at the 10 percent level, and for all other markets the level of significance exceeded 5 percent. Therefore, the hypothesized segmentation for these markets can be rejected.

Table 7.5 Test of Market Segmentation, *Rui* Prices; 1975-92

Market	F_{change}
Khulna	7.6*
Chittagong	.056
Sylhet	5.16*
Rangpur	20.6*
Rajshahi	2.87**

Source: Author's estimates based on BBS data
**Significant at the 10% level
*Significant at the 5% level

The next step is to look for short-run integration for among the non-segmented markets (Khulna, Sylhet, Rangpur and Rajshahi). This was done using the Timmer-Heytens modifications; the results are presented in Table 7.6. Two markets, Rangpur and Khulna, have an IMC of less than 1 and may be said to display short-run integration.

Table 7.6 Timmer-Heytens Modifications and IMCs, *Rui* and *Ilish* Prices, 1975-92

	b_2	$1+b_1$	b_3-b_1	IMC
		RUI		
Sylhet	.56	.62	.19	3.25
Rajshahi	.40	.66	.10	6.69
Rangpur	.62	.54	.57	**0.94**
Khulna	.45	.41	.53	**0.77**
		Ilish		
Sylhet	.38	.51	.28	1.82
Rajshahi	.94	.37	.51	**0.73**
Rangpur	.88	.10	.67	**0.15**
Khulna	1.02	.35	.60	**0.58**
Chittagong	.69	.55	.41	1.33

Source: Estimates based on BBS retail price data

A similar exercise using ilish prices rejects segmentation in all cases, accepts short-run integration for three markets (Rajshahi, Rangpur and Khulna) and implies long-run integration in the case of Sylhet and Chittagong.[8]

The direction of causality was tested by comparing Dhaka's performance as a central market (in determining Khulna and Chittagong prices) with the performance of Khulna and Chittagong in determining Dhaka prices. The results are shown in Table 7.7. The test found that, in fact, Dhaka prices have a stronger impact on both Chittagong and Khulna, rather than the other way around. Chittagong and Khulna prices, however, influence Dhaka prices as well, suggesting a two-way relationship rather than a unidirectional one.

[8] IMCs for Rajshahi, Rangpur and Khulna were less than one. The values of b_2 also approximate one, which according to Timmer are an indication of "instantaneous" adjustment.

Table 7.7 Direction of Causality

Peripheral	Central	β_1	β_0
Chittagong	Dhaka	.019	.30
Dhaka	Chittagong	-.09	.20
Khulna	Dhaka	-.15	.32
Dhaka	Khulna	-.08	.15

β_j = central market lagged
β_0 = current prices of *ilish*

7.3.4 Fish Markets in Comparison with Rice Markets

There has been sustained interest in rice market integration for more than two decades, stimulated both by concerns of market efficiency and policy.[9] If markets are efficient and well-integrated then interventions to stabilize consumer prices or support growers' prices will be much more effective and less costly than if the markets are inefficient and segmented.

The findings of these studies are very favourable to the hypothesis of spatially well-connected markets, although there are important caveats. Ravallion (1986), for instance, finds significant seasonal differences in market integration, as well as a difference between a famine and a non-famine period. Goleti (1993) and Choudhury (1992) find that markets generally are not segmented; that the majority of markets lack short-run integration; that there are significant seasonal differences in integration; and that price adjustments take time, typically two to three months. Thus there appear to be important constraints to the geographical flow of information and commodities, preventing short-run integration even in a market widely considered very competitive.

FAP 17's study of the fish market, on the other hand, points to well-integrated markets, at least for the major traded species, despite the fragile nature of the commodity and the difficulties associated with its handling, transport and storage.[10] The level of the market may, in fact, be an important determinant of spatial performance. While large, well-connected centres tend to be closely integrated, this may not be true for smaller peri-urban

[9] See, e.g., Farruk (1992), Ravallion (1986), Ahmed and Bernard (1989), Crow (1977) and Goleti (1993).

[10] See Coulter and Disney (1987) for a detailed study of the problems of handling, processing and marketing of fish in Bangladesh.

or rural centres, either among themselves or with larger centres. This hypothesis has not been tested for the rice market. Evidence from the fish market shows that real producer prices have remained virtually stationary, despite seasonal swings, over the period 1985-91, while retail prices registered a significant increase for most species over the same period (Table 7.8).

Table 7.8 Retail Real Price Growth Rate Trends; 1985-92

Area	*Rui*	*Ilish*	*Koi*	*Shingi*	*Chingri*	*Puti*
Dhaka	.039*	.030*	.014*	.027*	-.048*	.057*
Chittagong	neg.	.019	-.062*	-.063*	.122*	-.005
Khulna	.019	.020*	.040*	.030*	-.009	.045*
Narayanganj	.018*	-.004	.016*	.054*	.047*	.056*
Rajshahi	.035*	.009	.015	.012	-.004	-.023
Rangpur	-.061*	.007	-	-	-	-
Sylhet	-.001	-.04*	.041*	.008	-.068*	.015

Source: Author's estimates based on BBS monthly retail price data
Note: Coefficients were estimated by fitting semi-log trends, so these are also growth rates.
*Significant at the 5% level

7.3.5 Conclusion

The major fish retailing centres selected for the market integration test are well connected by roads, railways and telecommunications. *Rui* and *ilish*, the species considered in the exercise, are widely traded, with *ilish* dominating in terms of volume handled. The fish markets tested have been found to be spatially well-connected. It is possible, however, that the price of minor species may be much less integrated, as suggested by the poorer performance of *rui* in comparison with *ilish*.

A comparison of the results with research done on the rice market suggests that spatial arbitrage in fish markets is as efficient, if not more so, than rice markets. This is a somewhat surprising result, since fish markets are generally considered much less evolved than rice markets. The general view that non-cereal markets are highly imperfect thus needs to be

carefully examined.[11] A missing dimension to analyses of spatial integration is that inadequate attention is paid to market levels.

The FAP 17 test of direction of causality suggests that Dhaka prices are more important in determining Chittagong and Khulna prices, rather than vice-versa, but Chittagong and Khulna prices also have an impact on Dhaka prices, implying a two-way rather than a unidirectional relationship.

[11] Abdullah and Shahabuddin (1993, p.65) states: "While there is evidence of a relatively efficient rice marketing system to have evolved over time, most non-cereal crops have a disadvantage in this respect compared to rice. Marketing costs are generally high because of inadequate infrastructural facilities as also because of high price risks and private traders' lack of access to institutional credit".

FCD IMPACTS ON FISH TRADE

8.1 Traders' Views on Reasons for Fish Stock Decline

Over the past decade the total production from the open water capture fisheries particularly floodplain fisheries of Bangladesh has reportedly decreased. Several factors are believed to have been major contributors to the decline in fish stocks: 1) siltation of rivers, *khal* and *beel*; 2) FCD interventions; 3) overfishing; 4) the use of agro-chemicals; 5) the use of illegal fishing nets; and 6) fish epidemics. The complex nature of open water production systems makes it difficult to quantify the effects of each factor, and, indeed, other factors also may have contributed.

Since declining fish stocks affect fishermen's catch, and therefore the trade volumes of local *aratdar* and retailers, the Market Survey directed its questions about these impacts toward these three groups of respondents. The informants were asked to identify and rank the major reasons for fish stock declines in their locality. Only the three highest rankings have been considered in the results, which are presented by region in Table 8.1 and by respondent type in Table 8.2.

The majority of respondents in all study regions identify siltation of major water bodies as the first-ranked cause for the decline in fish stocks (Table 8.1). Among target respondents in the North West and South West regions, FCD interventions rank second and overfishing ranks third. In the North Central and North East regions informants rank overfishing second and the use of agro-chemicals third. In these regions FCD interventions rank fourth, perhaps because such interventions are of lesser magnitude in these regions than in the North West and South West.

Among all respondent types (Table 8.2) siltation is the highest-ranking cause for the decline in fish stocks. Fishermen in all four study regions rank overfishing second and FCD interventions third. *Aratdar* across all regions rank FCD interventions second and overfishing third. Retailers in all cases rank overfishing second and FCD interventions third. None of the respondents give fish disease even a third-place ranking.

Table 8.1 Reasons for Fish Stock Decline by Region (no. of respondents)

Region	Siltation of River/ *Beel/Khal*	FCD Projects	Overfishing	Agro-chemicals	Illegal Fishing Nets	Fish Disease
FIRST RANK						
North Central	29	0	1	0	0	0
North East	10	0	0	0	2	0
North West	15	6	5	0	0	0
South West	16	4	4	2	0	0
SECOND RANK						
North Central	9	0	0	1	0	0
North East	10	0	7	3	1	0
North West	9	3	3	1	0	0
South West	9	1	4	3	2	0
THIRD RANK						
North Central	3	0	0	0	0	0
North East	5	0	3	2	0	0
North West	8	3	1	0	0	0
South West	7	4	2	1	1	0

Source: FAP 17 Market Survey, 1993

Table 8.2 Reasons for Fish Stock Decline by Respondent Type (no. of respondents)

Respondent Type	Siltation of River/ *Beel/Khal*	FCD Projects	Overfishing	Agro-chemicals	Illegal Fishing Nets	Fish Disease
FIRST RANK						
Fisherman	26	4	5	0	0	0
Aratdar	19	4	1	1	2	0
Nikari	25	2	4	1	1	0
SECOND RANK						
Fisherman	16	2	9	5	2	0
Aratdar	7	1	3	1	0	0
Nikari	14	1	2	2	1	0
THIRD RANK						
Fisherman	10	6	1	0	1	0
Aratdar	10	0	0	1	0	0
Nikari	3	1	5	2	0	0

Source: FAP 17 Market Survey, 1993

8.2 Comparison of Markets Inside and Outside FCD Projects

Fish markets, especially secondary and tertiary ones, draw their fish supplies from a variety of production zones and production subsystems. The geographical location of a particular market, therefore, is insufficient as a criterion for its being treated as inside or outside an FCD project. A market located close to the project boundary or on its periphery may draw its supply from fishing grounds both inside and outside the FCD project.

Some primary markets have supply zones that clearly fall inside or outside FCD projects. The criterion used to select from among these markets for inside-outside comparison is that the market must draw 80% or more of its total supply from fishing grounds within one or more FCD projects. An outside market is one drawing its supply from production zones outside an FCD project area.

For this exercise paired markets—one inside and one outside—were selected from four sample markets in each region. Table 8.3 lists these paired markets.

Table 8.3 Paired Markets Used for Impact Assessment in the Four Study Regions

Region	Inside Market	Outside Market
North Central	Santosh fish market Santosh, Tangail	Jagathnagar fish market Saturia, Saturia
North East	Sherpur fish market Khalilpur, Moulvibazar	Lamakazi fish market Lamakazi, Biswanath
North West	Char Boalia fish market Ahmedpur, Sujanagar	Bildahar fish market Chamari, Singra
South West	Poysarhat fish market Bakal, Agailjhara	Koligram fish market Jalirpar, Muksedpur

Source: FAP 17 Market Survey, 1993

Two of the four inside markets, Char Boalia in the North West and Santosh in the North Central Region, get 100% of their supply from fishing areas inside FCD projects. Char Boalia market is a landing place for fish from Gandahasti *beel* (*Beel* Gajna) within the Pabna Irrigation and Rural Development Project (PIRDP), an FCD/I scheme. The market operates only between July and January. Santosh market draws its supply from areas within the Tangail Compartmentalization Pilot Project (CPP). Sherpur market, in the North West, gets 80% of its supply from fishing areas within the Manu Irrigation Project (FCD/I) and Poysarhat market, in the South West, receives at least 80% of its supply from empoldered areas of the Satla-Bagda Project.

The outside markets primarily depend on fish supplied from floodplain/*beel* fisheries not affected by FCD projects. All but one of the markets operate year-round. The exception, Jagathnagar market in the North Central Region, closes from February to June.

FCD impacts on fish trade have been assessed by comparing selected parameters in the paired markets. Two comparison approaches are used. First, the trading activities of the paired markets are compared. The parameters are: number of traders and volume of export to other markets during the peak and the lean periods. The second approach takes into account the assessment of FCD impacts by the markets' traders. The chosen indicators are: number of respondents reporting a decrease in trade volume, the extent of the decrease and FCD as a cause of the decreased trade volume.

8.2.1 Impacts on the Number of Traders and Volume of Exports

Table 8.4 shows that the average number of traders active in outside markets is higher during the peak period (400% versus 54% for inside markets). This difference significantly narrows during the lean period. Two of the inside markets cease functioning during the lean period.

Table 8.4 Average Number of Traders and Export Volume of Selected Primary Markets Inside and Outside FCD Projects During Peak and Lean Periods

Market Name	Inside/Outside FCD Project	Daily Average No. of Traders		Daily Average Export Volume (in maund*)	
		Peak	Lean	Peak	Lean
NORTH CENTRAL					
Santosh	I	5	3	0	0
Jagathnagar	O	116	76	50	20
NORTH EAST					
Sherpur	I	253	103	60	0
Lamakazi	O	385	195	50	10
NORTH WEST					
Char Boalia	I	35	0	20	0
Bildahar	O	175	70	30	0
SOUTH WEST					
Poysarhat	I	67	52	50	20
Koligram	O	200	50	80	2

Source: FAP 17 Market Survey, 1993
*1 maund = 37.32 kg

In all regions, and in most cases, the daily average export volume from the outside markets to higher markets is substantially higher than that of inside markets. Sherpur, the inside market in the North East Region, exports more than Lamakazi, its comparable outside market, during the peak period. Sherpur market has no retailing section. In the South West Region, the average lean period daily export volume from Poysarhat, the inside market, is higher than that of Koligram, the outside market. The reason for this is that Poysarhat gets its supply from floodplain/*beel*, rivers and ponds, while Koligram depends entirely on Chanda *beel* production, where little fishing is done during the lean period.

8.2.2 Traders' Assessment of FCD Impacts

The results of the assessment of FCD impacts by *aratdar* in the selected inside and outside markets are presented in Table 8.5.

Table 8.5 ***Aratdar*'s Assessment of FCD Impacts on the Fish Trade in Selected Inside and Outside Primary Markets**

Market Name	Inside/ Outside FCD Project	No. of Respondents	No. Reporting Decreased Trade Volume	Percent Decrease in Trade Volume	No. Identifying FCD as Major Cause
NORTH CENTRAL					
Santosh	I	0	0	-	-
Jagathnagar	O	3	3	27	0
NORTH EAST					
Sherpur	I	3	2	35	2
Lamakazi	O	3	2	25	0
NORTH WEST					
Char Boalia	I	0	-	-	-
Bildahar	O	0	-	-	-
SOUTH WEST					
Poysarhat	I	2	1	40	1
Koligram	O	3	1	20	0

Source: FAP 17 Market Survey, 1993

In the North West Region, wholesale transactions in both the inside and outside markets are too low to attract *aratdar*. Of the five *aratdar* in the two inside markets where they operate, three report a 35-40% decrease in trade volume during the previous five years and identify

FCD projects as the main cause. In the outside markets, six out of nine *aratdar* in three markets report a 20-27% decrease in volume. None, however, attribute the decline to FCD interventions.

The majority of the *aratdar* in the inside markets report larger reductions in trade volume than those operating in outside markets; they also identify FCD interventions as the main cause for the decline. The assessment by *aratdar* also suggests, however, that FCD interventions are not the sole factor responsible for reduced trade volume.

The results of the assessment of FCD impacts by retailers are summarised in Table 8.6. Retailers deal in small volumes of fish (28-44 kg) each day. Most are local traders, and could therefore be expected to have a good knowledge of changes in the local fish supply and the related causes of those changes.

Table 8.6 Retailers' Assessment of FCD Impacts on the Fish Trade in Selected Inside and Outside Primary Markets by Region

Market Name	Inside/ Outside FCD Project	No. of Respondents	No. Reporting Decreased Trade Volume	Percent Decrease in Trade Volume	No. Identifying FCD as Major Cause
NORTH CENTRAL					
Santosh	I	2	2	35	0
Jagathnagar	O	2	1	40	0
NORTH EAST					
Sherpur	I	2	2	40	1
Lamakazi	O	2	-	-	0
NORTH WEST					
Char Boalia	I	0	0	0	0
Bildahar	O	4	3	30	0
SOUTH WEST					
Poysarhat	I	2	1	20	2
Koligram	O	2	1	25	0

Source: FAP 17 Market Survey, 1993

In the North Central Region, retailers in both inside and outside markets report a substantial decrease in daily average trade volume during the previous five years. None identify FCD interventions as the major cause for the decline, however. Two respondents in the North East

inside market report reduced trade volumes, and one names FCD interventions as the main cause. The two retailers in the outside market report no change in their business volume. The selected inside market in the North West Region has no retail trade. Retailers in the outside market report heavy reductions in daily business. In the South West, both respondents in the inside market hold FCD projects responsible for the area's decline in fish availability, and one reports a decrease in his business volume. The two outside market respondents also report drops in business volume, but they do not consider FCD to be the main cause of the decline.

Only half of the retailers in inside markets hold FCD projects responsible for reductions in trade volume. The traders in the outside markets also experienced decreased volume but did not identify FCD interventions as the main cause.

In conclusion, then, FCD interventions in the floodplains have some negative impacts on the fish trade. Other factors, however, have simultaneously contributed to these changes.

CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

(1) Wide seasonal fluctuations in fish supply are a common phenomenon that is linked to the main harvest of market-dominant species. During peak *beel* harvests and major pond harvests the fish supply increases and trade volume rises with it. During the lean period the volume per trader is significantly reduced.

(2) As the population of Bangladesh continues to rise, the fish marketing system will be required to handle larger volumes of fish. Moreover, there are indications that urban fish consumption is growing faster than rural consumption. If this trend continues, more fish will have to be moved from surplus production areas to urban consumption centres.

(3) The existing fish marketing system is reasonably efficient, but improved distributional infrastructure and support services could improve efficiency.

(4) There are insufficient supplies of ice throughout the inland fish marketing system. Although some public sector ice plants have unused capacities, remote production zones suffer from ice shortages due to the uneven geographical distribution of plants and an inadequate communication system.

(5) Fishermen and traders are unknowledgeable about the optimum level of ice use for fish preservation. Traders typically apply only about one-third of the desirable amount of ice.

(6) Road and water transport dominate the long-distance shipping of fish. Slow-moving modes of transportation, such as country boats, push carts and rickshaw van, are extensively used for short distances. Regardless of the mode of transportation, however, there are no insulation and refrigeration facilities.

(7) Marketing agents act within a framework governed by links of patronage, kinship and credit. *Mahajan* and *aratdar* are the chief providers of much-needed financing for small traders and poor fishermen.

(8) Fish traders largely depend on their own resources for working capital. Even *aratdar*'s dependence on credit for working capital is small. The risky nature and low returns of the fish trade do not generate the confidence needed to access institutional credit.

(9) The trade margins earned by fish traders do not appear to be excessive, and rates of return to capital seem modest despite the existence of considerable variation both among traders and across regions.

(10) Retail prices for fish have sharply risen over the period 1975-92, while producers' prices have virtually stagnated. Wholesale prices have also risen, but at a lesser rate than retail prices.

(11) Fish markets are well connected—at least for the major traded species and across major centres.

(12) Flood control measures may have some negative impacts on the fish trade by reducing fish stocks, but other factors may have simultaneously contributed to these changes.

9.2 Recommendations

(A) Proper landing facilities should be provided at important fish landing centres and markets.

(B) Refrigerated or insulated carriers should be introduced for the transport of fish from major assembly centres to urban consumer centres to ensure fish quality. Additional costs for this will be more than compensated by the better prices quality fish would bring.

(C) Ice factories should be established in adequate numbers and capacities at convenient locations close to the main fish production zones. The government should provide liberal credit for such enterprises.

(D) Fish traders and fishermen should be trained in the benefits of proper ice application for fish and in the optimum level of ice required.

(E) A special study should be undertaken to examine in depth the need for, and justification of, the scientific sorting and grading of fish in Bangladesh.

(F) Fish auction procedures and weights and measures should be regulated.

(G) A portion of public rural credit should be earmarked for fishermen and small traders and be channelled to them through NGOs. Commercial banks may not be the proper vehicle for handling small amounts of credit for these people.

(H) Cooperative marketing organisations run exclusively by fishermen should be developed. These organisations would help individual fishermen to deliver small catches for processing or storage. This would enhance their bargaining power.

(I) New fish products using marine species should be developed and introduced into the domestic market to ease the rising demand for fish. Modern processing technology can make marine species more acceptable to domestic consumers. Prior to their launch into the market, these new products could be introduced to public institutions such as schools and hospitals to make them familiar to consumers.

GLOSSARY

arat — Wholesale shop dealing with fish on a commission basis.

aratdar — Fish wholesaler. A key figure in the marketing chain. Generally the source of credit inputs into the marketing system, advancing money to others in the system to ensure fish supply. Usually based in district wholesale markets.

baor — An oxbow lake; a cut-off curve or meander of a river. Sometimes completely isolated, sometimes connected seasonally or at one end to the parent river. Also used for old river beds now far from the present course of the river (may also be called a *beel*).

beel — A swamp or depression. Can be either perennial or seasonal. It is a term used for a wide variety of freshwater bodies (oxbow lakes, old river beds, *khal*, even artificial channels). Often refers to flooded areas with no longer an obvious deeper section or depression.

bepari — *Bepari* is a professional fish trader. He purchases fish from *faria* or fishermen and sells his fish to retailers or other distributors.

chalani — Traders who buy and transport fish between different markets.

dadan — *Dadan* is a non-institutional credit given by market intermediary to ensure continuous supply of fish.

dalal — A *dalal* is a broker acting for *mahajan*, *bepari* or *aratdar* acting as *mahajan*.

faria — Small traders who purchase fish directly from fishermen and sell to *bepari*.

haor — Depression on the floodplain located between two or more rivers, which functions as a small internal drainage basin.

hogla Leaves used for covering roof of hut, mostly observed in coastal areas.

izaradar *Izaradar* is a government granted lessee of a market, who realizes tolls from the market.

jalliya Generic terms for fishermen used in different parts of the country.

jalmahal A "water estate", now referring to any area of *khas* water body controlled by the government and normally leased out for fisheries.

jiani Derogatory term used for Muslim professional fishermen, particularly around Chalan *beel*.

jogandar *Jogandar* is a local term for *mohajan*.

khal Artificial or natural channel, small river or canal.

mahajan A very generic but important term that is most commonly used for moneylenders. Effectively it means almost any rich, influential person in rural areas (closer to its literal meaning, "great man"). These people usually lend money as well. In fisheries, it is commonly used to refer to the leaseholder of a particular water body, the owner of or major shareholder in a particular fishing operation. Also used for many *aratdar* who are generally moneylenders in their own right.

maimul Muslim traditional fishermen and traditional leaseholders. A caste-like group sometimes extended for bureaucratic convenience to anyone involved in, or wishing to become involved in, fisheries, including leaseholders.

nikari A generic term for fish traders. Occasionally used for Muslims involved in fisheries activities of any kind.

paikar Fish traders who purchase fish from wholesale markets.

thana	Equivalent of a sub-district or county. Seat of the *thana nirbahi* committee, which plays an important role in allocating fisheries leases and, under the NFMP, in the identification and licensing of fishermen.
tola	*Tola* is a small share of fishermen's commodity (fish) which is taken by *izaradar* or *aratdar* as revenue.
samity	Association of people grouped together for a common objective or purpose.

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APPENDIX A

TABLES

Table 3.1 Fish Production for the Period 1983-84 to 1989-90

Source	1983-84	1984-85	1985-86	Annual Production (mt)				Increments	Mean Growth Rate
				1986-87	1987-88	1988-89	1989-90		
INLAND WATER									
Open Water (capture)									
(1) Rivers & Estuaries	207,766	213,057	199,600	195,117	183,817	181,140	183,607	(24,159)	-1.9
(2) Sundarban	7,783	6,825	7,112	6,035	8,066	6,416	6,393	(1,390)	-3.0
(3) Depressions (*beel & haor*)	51,373	45,893	45,258	42,077	45,610	47,019	46,594	(4,779)	-1.6
(4) Kaptai Lake	4,057	2,700	2,433	3,981	4,068	3,439	3,713	(344)	-1.4
(5) Flooded Land	200,616	194,130	187,396	183,796	182,037	186,126	178,000	(22,616)	-1.9
Subtotal	471,595	462,605	441,799	431,006	423,598	424,140	418,307	(53,288)	-1.9
Closed Water (culture)									
(1) Ponds	107,944	111,567	123,804	142,876	149,423	155,012	163,730	55,786	8.6
(2) Oxbow Lakes (*baor*)	862	962	968	1,174	1,254	1,321	1,357	495	9.6
(3) Shrimp Farms	8,219	11,282	19,951	22,050	25,248	27,172	27,505	19,286	39.1
Subtotal	117,025	123,811	144,723	166,100	175,925	183,505	192,592	75,567	10.8
Inland Total	588,620	586,416	586,522	597,106	599,523	607,645	610,899	22,279	0.6
MARINE FISHERIES									
Industrial	14,500	12,440	11,898	12,356	10,395	10,353	11,379	(3,121)	-3.6
Artisanal	150,382	175,123	195,503	205,223	217,187	222,928	227,684	77,302	8.6
Marine Total	164,882	187,563	207,401	217,579	227,582	233,281	239,063	74,181	7.5
Country Total	**753,502**	**773,979**	**793,923**	**814,685**	**827,105**	**840,926**	**849,962**	**96,460**	**2.1**

Source: DoF

Table 3.2 Annual Change in Fish Production for the Period 1983-84 to 1989-90

Source	Baseline (1983-84)	Annual Change (percent)					
		1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
INLAND WATER							
Open Water (capture)							
(1) Rivers & Estuaries	207,766	3	-6	-2	-6	-1	1
(2) Sundarban	7,783	-12	4	-15	34	-20	0
(3) Depressions (*beel* & *haor*)	51,373	-11	-1	-7	8	3	-1
(4) Kaptai Lake	4,057	-33	-10	64	2	-15	8
(5) Flooded Land	200,616	-3	-3	-2	-1	2	-4
Subtotal	471,595	-2	-4	-2	-2	0	-1
Closed Water (culture)							
(1) Ponds	107,944	3	11	15	5	4	6
(2) Oxbow Lakes (*baor*)	862	12	1	21	7	5	3
(3) Shrimp Farms	8,219	37	77	11	15	8	1
Subtotal	117,025	6	17	15	6	4	5
Inland Total	588,620	0	0	2	0	1	1
MARINE FISHERIES							
Industrial	14,500	-14	-4	4	-16	0	10
Artisanal	150,382	16	12	5	6	3	2
Marine Total	164,882	14	11	5	5	3	2
Country Total	**753,502**	**3**	**3**	**3**	**2**	**2**	**1**

Source: DoF

Table 3.3 *Ilish* Catch for the Period 1985-86 to 88-89 (mt)

Year	Inland Catch	Marine Catch	Total Catch	Inland (% of total)	Marine (% of total)
1985-86	94,794	96,294	191,088	49.61	50.39
1986-87	91,167	103,814	194,981	46.75	53.25
1987-88	78,551	104,950	183,501	42.81	57.19
1988-89	81,641	110,311	191,952	42.54	57.47

Source: Fish catch statistics, DoF

Table 3.4 Occurrence Frequency of *Hat Bazar* by Region

Region	Sessions per Week		
	One	Two	Three
North Central	1	1	1
North West	0	1	2
South West	0	1	5

Source: FAP 17 Market Survey, 1993

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Table 3.5 Peak and Lean Periods at Fish Markets by Type and Region; 1993

Region	Market Name	Market Type*	Peak Period	Lean Period 1	Lean Period 2
North Central	Jagathnagar	P	Nov-Jan	July-Oct	Feb-June
North Central	Santosh	P	Aug-Jan	Feb-Jul	-
North Central	Jhitka	P	Sep-Jan	Feb-Aug	-
North Central	Tora Ghat	P	Aug-Jan	Feb-Jul	-
North East	Ghater Bazar	P	May-Nov	Nov-Jan	Feb-April
North East	Pagla Bazar	P	Nov-Mar	Apr-Nov	-
North East	Sherpur	P	Jul-Dec	Jan-Jun	-
North East	Lamakazi	P	Nov-Mar	Mar-Nov	-
North West	Chanchkoir	P	Sep-Feb	Mar-Aug	-
North West	Karanja C&B	P	Nov-Feb	Mar-Aug	-
North West	Char Boalia	P	Sep-Jan	Jun-Aug	Feb-May
North West	Bildahar	P	Oct-Feb	Mar-Jul	-
South West	Bhanga	P	Sep-Jan	Feb-Aug	-
South West	Poysar Hat	P	Oct-Jan	Feb-Aug	-
South West	Ghagar	P	Oct-Feb	Mar-Sep	-
South West	Koligram	P	Sep-Feb	Mar-Aug	-
North Central	Aricha	S	Apr-Aug	Sep-Mar	-
North East	Habiganj	S	Oct-Mar	Mar-Oct	-
North East	Sylhet	S	Oct-Mar	Mar-Oct	-
North East	Moulvibazar	S	Oct-Mar	Mar-Oct	-
North West	Natore	S	Jun-Dec	Apr-Jun	-
North West	Boral Bridge	S	Oct-Feb	Jul-Sep	-
North West	Singra Fish Arat	S	Nov-Jan	May-Aug	-
South West	Goalanda Ghat	S	Oct-Feb	Mar-Sep	-
South West	Madaripur	S	Sep-Feb	Mar-Aug	-
South West	Taker Hat	S	Oct-Mar	Apr-Sep	-
North Central	Manikganj	T	Nov-Mar	Apr-Oct	-
North East	Srimangal	T	Oct-Apr	Apr-Aug	-
North West	Bogra	T	Oct-Feb	Jul-Sep	-
South West	Faridpur	T	Oct-Mar	Apr-Sep	-

Source: FAP 17 Market Survey, 1993

*P = Primary Market; S = Secondary Market; T = Tertiary Market

Table 3.6 Average Daily Volume of Exports, Lower Markets to Higher, During Peak and Lean Periods

Region	Average Daily Volume of Exports (mt)		Lean Period Volume as % of Peak Period
	Peak Period	Lean Period	
Primary Markets			
North Central	2.35	1.38	59
North East	1.87	0.19	10
North West	1.12	0.04	3
South West	1.64	0.26	16
Secondary Markets			
North Central	5.60	0.75	13
North East	23.63	6.61	28
North West	2.61	0.15	6
South West	3.36	0.56	17

Source: FAP 17 Market Survey, 1993

Table 3.7 Average Daily Volume of Fish Traded by *Aratdar* by Species Group and Region During Peak and Lean Periods

Region	Major Carp		Exotic Carp		Snakehead		Other Large Species		Live Fish		Small Fish		*Ilish*	
	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean
North Central	53	14	32	16	20	17	23	11	13	5	84	32	57	18
North East	153	117	100	55	57	12	141	81	51	21	205	38	2333	524
North West	97	31	49	13	26	4	122	9	31	7	154	18	180	107
South West	24	9	19	7	35	9	24	8	33	9	50	11	0	348

Source: FAP 17 Market Survey, 1993

Table 4.1 Average Covered Space, Open Area and Number of Sheds in Sample Markets* by Region

Region	Average Covered Area (m^2)	Average Open Area (m^2)	Average No. of Sheds
PRIMARY MARKETS			
North Central	56	231	2
North East	100	194	4
North West	163	130	1
South West	136	63	5
SECONDARY MARKETS			
North Central	18	323	1
North East	250	375	7
North West	118	118	5
South West	145	165	2
Dhaka	400	1,400	74
TERTIARY MARKETS			
North Central	90	323	3
North East	150	375	1
North West	300	118	10
South West	50	100	1

Source: FAP 17 Market Survey, 1993

*Number of markets surveyed: Primary = 16, Secondary = 13 (including three Dhaka markets), Tertiary = 4

Table 4.2 Facilities Available for Wholesale and Retail Marketing at Fish Markets* (no. of markets)

Region	Wholesale Facility			Retail Facility		
	Water Supply & Storage	Water Supply, No Storage	No Water Supply or Storage	Adequate Sheds and Space	Sheltered but Inadequate	Open Air Markets
PRIMARY MARKETS						
North Central	0	0	4	0	2	2
North East	0	0	4	0	0	4
North West	0	0	4	2	1	1
South West	2	1	1	2	2	0
SECONDARY MARKETS						
North Central	0	0	1	0	1	0
North East	0	1	0	2	1	0
North West	0	0	3	1	1	1
South West	0	3	0	2	1	0
Dhaka	1	2	0	0	0	3
TERTIARY MARKETS						
North Central	0	1	0	1	0	0
North East	0	1	0	1	0	0
North West	0	1	0	1	0	0
South West	1	0	0	0	1	0

Source: FAP 17 Market Survey, 1993

* Number of markets surveyed: Primary = 16; Secondary = 13 (including three in Dhaka); Tertiary = 4

Table 4.3 Physical Structures in Markets* (no. of markets)

Region	Tin Shed	Bamboo & Thatch	Tin Shed & *Pucca* Floor	Building	Total
PRIMARY MARKET					
North Central	0	0	2	0	2
North East	1	1	0	0	2
North West	2	0	1	0	3
South West	0	0	3	0	3
SECONDARY MARKET					
North Central	0	0	1	0	1
North East	0	0	1	0	1
North West	1	0	1	1	3
South West	0	0	3	0	3
Dhaka	0	0	2	0	2
TERTIARY MARKET					
North Central	0	1	0	0	1
North East	0	0	0	1	1
North West	0	0	1	0	1
South West	0	0	1	0	1

Source: FAP 17 Market Survey, 1993

* Number of markets surveyed: Primary = 16, Secondary (including three Dhaka markets) = 13, Tertiary = 4

Table 4.4 Packaging Materials Used*

Region	Packaging Type (% of traders)			Natural Materials (no. of markets)		
	Metal Drum	Wooden Box	Bamboo Basket	Hogla Leaves	Banana Leaves	Water Hyacinth
PRIMARY MARKET						
North Central	10	0	90	0	1	0
North East	0	0	100	0	2	4
North West	15	0	85	0	4	0
South West	2	25	73	1	0	0
SECONDARY MARKET						
North Central	0	0	100	0	0	0
North East	8	18	73	0	2	3
North West	23	0	77	0	3	1
South West	10	33	57	0	0	0
Dhaka	43	27	30	0	0	0
TERTIARY MARKET						
North Central	0	0	100	0	0	0
North East	0	0	100	0	0	1
North West	20	0	80	0	0	0
South West	30	0	70	0	0	0

Source: FAP 17 Market Survey, 1993

* Number of markets surveyed: Primary = 16, Secondary = 13 (including three Dhaka markets), Tertiary = 4

Table 4.5 Weighing Systems and Support Services Availability (no. of markets)

Region	Weighing System			Support Services	
	Metric System	Lot System	Metric & Lot Systems	Banking Facility	Telephone
PRIMARY MARKET					
North Central	0	4	0	3	1
North East	0	4	0	2	0
North West	0	1	3	3	1
South West	0	2	2	2	0
SECONDARY MARKET					
North Central	0	1	0	1	1
North East	0	1	2	2	2
North West	2	0	1	3	1
South West	0	1	2	3	2
Dhaka	3	0	0	3	3
TERTIARY MARKET					
North Central	1	0	0	1	1
North East	0	1	0	1	1
North West	1	0	0	1	1
South West	0	0	1	1	1
All Regions	**7**	**15**	**11**	**26**	**15**

Source: FAP 17 Market Survey, 1993

* Number of markets surveyed: Primary = 16, Secondary = 13 (including three Dhaka markets), Tertiary = 4

Table 4.6 Ice Factories within 10 km of Sample Markets and Their Production Capacity

Region	Enterprise Name	Capacity (tons)	Daily Summer Production		Average Production Level (% of capacity)
			Block (kg)	Flake (kg)	
North Central	Bhai Bhai Ice Cream Factory	0.35	0	250	30
	Ramjan Ice Factory	0.10	0	50	50
	Sohrab Ice Factory	0.10	0	50	50
	Raju Ice Cream Factory	0.40	200	250	70
	Robin Ice Cream Factory	0.45	0	400	75
	M/S Shohel Enterprise	0.50	0	500	80
	Tripti Ice Cream Factory	0.35	0	300	70
	Ruma Ice Cream Factory	0.10	0	150	60
	Khan Brothers	0.50	0	400	70
North East	Easmin Ice Cream Factory	1.00	400	30	70
	Ratna Ice Cream Factory	0.37	225	0	60
	Siraj Ice Cream Factory	0.00	400	0	100
	Panna Ice Cream Factory	1.92	700	0	50
	Modhu Ice Cream Factory	0.80	300	50	55
	Moli Ice Cream Factory	0.70	120	50	55
	Himel Ice Cream Factory	1.50	500	75	50
	Jalalabad Ice Plant	10.00	10,000	0	100
	Mortuza Ice Cream Factory	1.00	700	100	70
	Alfi Mia Ice Factory	0.50	400	50	80
	Polack Ice Cream Factory	0.50	300	40	80
	Kokola Ice Cream Factory	1.50	600	100	50
	Janjan Ice Cream Factory	0.50	300	40	60
	Asha Ice Cream Factory	0.50	200	150	50
	Ananda Ice Cream Factory	0.50	300	150	80
	Shumi Ice Factory	1.00	600	100	70
North West	Shohel Ice Cream Factory	0.24	240	20	60
	Dulal Ice Cream Factory	0.35	0	100	70
	Mama Bhagina Ice Factory	0.40	0	150	75
	Mama Bhagne Ice Factory	0.70	200	40	95
	Modina ice Factory	0.70	200	25	75
	Sahidul Ice Factory	0.90	400	35	95
	Momtaz Ice Cream Factory	0.40	300	0	75
	Uttara Ice Cream Factory	0.40	300	0	75
	Uttora Ice Factory	1.00	900	0	90
	Sultana Ice Cream Factory	0.50	400	0	80
	Anny Ice Cream Factory	0.50	360	0	70
	Sathi Ice Cream Factory	0.80	400	50	75
South West	Kaium Ice Cream	0.70	500	20	70
	Ice and Ice Cream Mill	0.50	300	30	60
	Anik Ice Cream Factory	0.38	225	120	60
	Ice Cream Factory	0.54	540	0	100
	M.S. Chaudhury Ice Plant	10.00	8,000	0	80
	Himalaya Traders	1.75	1,750	0	65
	M Shikder Ice Cream Factory	0.75	400	25	60
	Chandra Ice Factory	0.70	500	20	70
	Lima Ice Cream Factory	0.25	150	25	60

Source: FAP 17 Market Survey, 1993

Table 4.7 Ice/Fish Ratios for Markets by Region Based on the Production Capacity of Ice Factories within 10 km of Sample Markets

Market Name	No. of Factories	Production Capacity (mt)	Market Exports of Fish (mt)	Ice/Fish Ratio
NORTH CENTRAL				
Jhitka	3	1.80	2.24	0.80
Tora Ghat	2	0.80	2.99	0.27
Jagathnagar	2	0.20	1.87	0.11
Santosh	0	0.00	0	-
Aricha	4	1.70	5.6	0.30
Manikganj	1	0.10	0	-
NORTH EAST				
Karanja C&B	0	0.00	2.24	0.00
Char Boalia	1	0.50	2.24	0.22
Bildahar	1	0.40	1.12	0.36
Chanchkoir	1	0.40	1.87	0.21
Singra Fish Arat	4	4.90	11.2	0.44
Natore	1	10.00	44.79	0.22
Boral Bridge	5	5.00	14.93	0.33
Bogra (Rajabazar)	3	2.00	0	-
NORTH WEST				
Ghater Bazar	1	0.40	1.87	0.21
Sherpur	0	0.00	0.75	0.00
Paglabazar	2	0.80	1.12	0.71
Lamakazi	0	0.00	0.75	0.00
Moulvibazar	3	0.00	2.99	0.00
Sylhet (Kazibazar)	3*	1.80	1.87	0.96
Habiganj	0	0.00	2.99	0.00
Srimangal	3	1.80	4.67	0.39
SOUTH WEST				
Ghagar	1	0.50	1.12	0.45
Poysar Hat	1	0.50	1.87	0.27
Bhanga	1	0.40	0.56	0.71
Koligram	0	0.00	2.99	0.00
Taker Hat	1	0.50	7.49	0.07
Madaripur	1	10.00	1.87	5.35
Faridpur	1	1.70	0.75	2.28
Gopalganj	3	1.00	0	-

Source: FAP 17 Market Survey, 1993

* Includes one factory 2-5 km from market that produces 1 mt.

Table 4.8 Transportation Modes Used for Inbound and Outbound Fish Shipments (percent volume of fish)

Region	Head Load		Boat		Mechanised Boat		Rickshaw Van		Bus		Truck		Railway	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
PRIMARY MARKET														
North Central	29	5	30	0	22	0	15	30	1	17	3	48	0	0
North East	20	30	47	0	15	0	0	15	13	50	5	5	0	0
North West	13	0	35	0	27	43	15	10	7	42	3	5	0	0
South West	60	0	25	0	5	50	10	0	0	25	0	25	0	0
SECONDARY MARKET														
North Central	0	0	40	0	50	0	10	0	0	20	0	80	0	0
North East	7	0	0	0	13	0	18	0	35	50	20	50	7	0
North West	12	0	15	0	50	7	3	0	10	53	0	13	10	27
South West	20	0	18	0	2	17	38	0	22	20	0	63	0	0
Dhaka	0	0	0	0	17	0	0	73	23	0	47	27	13	0
TERTIARY MARKET														
North Central	0	0	0	0	0	0	40	70	10	30	50	0	0	0
North East	20	20	0	0	0	0	20	0	20	40	30	40	10	0
North West	0	0	0	0	0	0	40	0	50	80	10	20	0	0
South West	20	0	0	0	0	0	70	0	10	0	0	100	0	0

Source: FAP 17 Market Survey, 1993

Table 4.9 Fish Traders Suffering Transportation Loss by Mode of Transport and Region (% of respondents)

Region	Head Load	Boat	Mechanised Boat	Rickshaw Van	Bus	Truck	Railway
Faria							
North Central	10	20	0	0	0	20	0
North East	25	0	17	0	0	0	0
North West	14	14	0	0	0	0	29
South West	15	0	0	0	0	0	0
All Regions	**16**	**8**	**4**	**0**	**0**	**5**	**7**
Bepari							
North Central	0	20	20	20	20	0	0
North East	8	17	0	0	25	0	0
North West	13	19	0	13	19	0	13
South West	0	0	0	9	9	0	0
All Regions	**5**	**14**	**5**	**10**	**18**	**2**	**3**

Source: FAP 17 Market Survey, 1993

Table 4.10 Cause of Transportation Losses (% of respondents)

Region	Shipping Time	Transport Breakdown	Preservation Difficulties	Extortion of Money
Faria				
North Central	30	20	0	0
North East	33	8	0	0
North West	29	29	0	0
South West	15	0	0	0
All Regions	**26**	**14**	**0**	**0**
Bepari				
North Central	40	20	0	20
North East	33	17	8	0
North West	38	38	0	0
South West	9	0	0	9
All Regions	**30**	**20**	**0**	**0**

Source: FAP 17 Market Survey, 1993

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Table 5.1 Average Daily Number of Fishermen, Traders and Consumers Attending Fish Markets During the Lean Period, 1993

Region	Fisherman	*Faria*	*Bepari*	*Paikar*	*Chalani*	*Aratdar*	*Nikari*	Consumer
PRIMARY MARKET								
North Central	110	12	100	50	-	13	23	118
North East	123	90	-	100	150	4	37	150
North West	223	32	25	40	-	8	60	165
South West	95	60	-	80	10	3	58	193
SECONDARY MARKET								
Dhaka City	-	-	**500**	**1433**	-	**103**	-	-
North Central	200	300	-	-	200	39	50	250
North East	150	125	417	65	86	29	85	275
North West	83	140	75	118	5	8	90	675
South West	183	60	133	50	20	28	70	717
TERTIARY MARKET								
North Central	22	-	17	-	-	-	25	300
North East	150	50	100	50	-	10	50	450
North West	100	-	200	60	30	20	30	500
South West	100	-	30	-	-	2	125	800
ALL REGIONS								
Primary	138	52	40	74	80	6	44	157
Secondary	145	136	300	589	80	42	76	538
Tertiary	93	50	87	55	30	11	58	513

Source: FAP 17 Market Survey, 1993

Table 5.2 Average Daily Number of Fishermen, Traders and Consumers Attending Fish Markets During the Lean Period, 1993

Region	Fisherman	*Faria*	*Bepari*	*Paikar*	*Chalani*	*Aratdar*	*Nikari*	Consumer
PRIMARY MARKET								
North Central	41	8	25	40	-	13	17	48
North East	52	53	-	37	-	4	22	83
North West	37	13	5	10	-	6	32	100
South West	39	25	-	20	-	2	25	103
SECONDARY MARKET								
Dhaka City	-	-	**383**	**1383**	-	**103**	-	-
North Central	50	100	-	-	30	39	40	200
North East	40	40	130	30	60	29	35	200
North West	27	27	20	40	-	8	60	450
South West	73	20	67	20	5	23	45	483
TERTIARY MARKET								
North Central	10	-	10	-	-	-	25	200
North East	50	30	50	30	-	10	40	350
North West	40	-	50	50	10	20	25	300
South West	60	-	20	-	-	2	75	500
ALL REGIONS								
Primary	42	25	15	31	-	6	23	82
Secondary	47	38	176	534	39	41	46	369
Tertiary	40	30	33	40	10	11	41	338

Source: FAP 17 Market Survey, 1993

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Table 5.3 ***Faria, Bepari, Chalani*** **and** ***Nikari*** **Degree of Involvement in Fish Trade and Secondary Occupations, 1993 (percent of total respondents)**

Region	Degree of Involvement				Secondary Occupation		
	Full-time	Part-time					
		Beel Harvest	Pond Harvest	*Beel* & Pond Harvest	Fishing	Agriculture	Other
				FARIA			
North Central	90	0	0	10	10	0	0
North East	82	18	0	0	0	9	9
North West	72	14	0	14	0	28	0
South West	77	23	0	0	0	8	15
				BEPARI			
Dhaka City	**67**	**33**	**0**	**0**	**0**	**0**	**33**
North Central	100	0	0	0	0	0	0
North East	77	23	0	0	0	8	15
North West	74	13	0	13	0	26	0
South West	64	9	27	0	0	27	9
				CHALANI			
Dhaka City	83	17	0	0	0	0	17
				NIKARI			
North Central	100	0	0	0	0	0	0
North East	100	0	0	0	0	0	0
North West	96	4	0	0	0	4	0
South West	100	0	0	0	0	0	0

Source: FAP 17 Market Survey, 1993

Table 5.4 ***Faria, Bepari, Chalani* and *Nikari*: Their Residence, Religion and Number of Operation Markets, 1993**

Region	Religion		Residence					No. of Operating Markets			
			Same as Market...				Outside District				
	Islam	Hinduism	Village	Union	Thana	District		1	2	3	>3
FARIA											
North Central	50	50	10	30	30	30	0	50	50	0	0
North East	100	0	27	18	27	10	18	9	91	0	0
North West	100	0	0	0	43	57	0	43	57	0	0
South West	31	69	15	23	31	31	0	69	23	8	0
BEPARI											
Dhaka City	**100**	**0**	**0**	**0**	**0**	**0**	**100**	**100**	**0**	**0**	**0**
North Central	60	40	0	0	60	20	20	60	20	20	0
North East	69	31	0	0	31	0	69	55	15	15	15
North West	94	6	13	19	25	37	6	63	25	6	6
South West	55	45	0	0	36	28	36	36	45	19	0
CHALANI											
Dhaka City	67	33	0	0	0	0	100	100	0	0	0
NIKARI											
North Central	33	67	0	8	92	0	0	42	25	33	0
North East	100	0	40	35	25	0	0	55	35	10	0
North West	87	13	13	35	44	4	4	70	17	4	9
South West	35	65	30	50	20	0	0	95	0	5	0

Source: FAP 17 Market Survey, 1993

Table 5.5 *Aratdar* Family Ties to Trade and Period of Involvement, 1993 (percent)

Region	Market Type	Family Connections		Period of Involvement (years)		
		Father Was *Aratdar*	Brother Is *Aratdar*	1-10	11-20	>20
PRIMARY MARKET						
North Central	1	0	0	50	38	13
North East	1	0	10	60	30	10
North West	1	0	0	100	0	0
South West	1	38	50	88	13	0
SECONDARY MARKET						
North Central	2	0	0	33	67	0
North East	2	22	22	67	33	0
North West	2	11	22	67	11	22
South West	2	44	33	44	33	22
Dhaka City	**2**	**33**	**67**	**44**	**56**	**0**
TERTIARY						
North Central	3	0	0	67	33	0
North East	3	67	67	0	67	33
North West	3	67	33	100	0	0
South West	3	0	100	100	0	0

Source: FAP 17 Market Survey, 1993

Table 5.6 Traders' Sources of Fish Supply; Peak and Lean Periods, 1993

Region	Source of Supply (% distribution)									
	Own		Fisherman		*Faria*		*Bepari*		*Aratdar*	
	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean	Peak	Lean
FARIA										
North Central	40	40	60	60	0	0	0	0	0	0
North East	0	0	100	100	0	0	0	0	0	0
North West	14	0	86	100	0	0	0	0	0	0
South West	0	0	100	100	0	0	0	0	0	0
BEPARI										
Dhaka	0	0	53	60	37	40	10	0	0	0
North Central	0	0	76	76	0	0	0	0	24	24
North East	0	4	92	88	0	0	0	0	8	8
North West	0	0	89	88	2	3	0	0	9	10
South West	0	0	100	100	0	0	0	0	0	0
CHALANI										
Dhaka City	0	0	12	12	0	0	0	0	88	88
NIKARI										
North Central	35	31	9	23	0	0	0	0	56	46
North East	3	3	22	27	0	0	0	0	75	70
North West	4	0	46	54	2	3	0	0	48	43
South West	0	0	37	38	2	2	5	5	56	55

Source: FAP 17 Market Survey, 1993

Table 6.2 Fish Trader Costs and Returns; North East Region, 1993 (taka)

Trader Type	No. of Respondents	Marketing Costs	Buying Price	Total Costs	Selling Price	Return/ Trader	Percent
PRIMARY MARKET							
Fisherman	4	652	-	652	8,775	2,030	-
Faria	3	867	11,890	12,757	14,405	549	12.90
Nikari	4	109	7,270	7,379	8,460	270	14.6
SECONDARY MARKET							
Fisherman	3	897	-	897	13,618	4,240	-
Bepari	3	1,128	11,888	13,061	14,550	496	11.80
Nikari	3	164	14,490	14,644	17,250	869	17.8
TERTIARY MARKET							
Fisherman	3	150	-	150	2,895	915	-
Bepari	3	308	660	6,908	8,150	414	17.90
Nikari	3	24	2,065	2,089	2,640	184	26.30

Source: FAP 17 Market Survey, 1993

Table 6.3 Fish Trader Costs and Returns; North West Region, 1993 (taka)

Trader Type	No. of Respondents	Marketing Costs	Buying Price	Total Costs	Selling Price	Return/ Trader	Percent
PRIMARY MARKET							
Fisherman	5	311	-	311	5,059	949.60	-
Faria	4	149	2,250	2,399	2,741	85.50	14.30
Bepari	4	230	3,916	4,146	3,881	LOSS	-
Nikari	4	138	3,794	3,932	4,275	85.75	8.70
SECONDARY MARKET							
Fisherman	3	212	-	212	1,712	500	-
Faria	2	67	762	829	966	68.50	16.5
Bepari	3	244	4,485	4,709	5,250	180.30	11.5
Nikari	3	79	4,263	4,342	4,960	206	14.2
TERTIARY MARKET							
Fisherman	3	171	-	171	2,649	826	-
Bepari	3	268	2,501	2,769	3,462	231	25
Nikari	3	19	7,648	7,667	8,607	313	12.30

Source: FAP 17 Market Survey, 1993

Table 6.4 Fish Trader Costs and Returns; South West Region, 1993 (taka)

Trader Type	No. of Respondents	Marketing Costs	Buying Price	Total Costs	Selling Price	Return/ Trader	Percent
PRIMARY MARKET							
Fisherman	4	435	-	435	3,988	888	-
Faria	4	306	4,510	4,816	5,682	217	18
Nikari	4	112	4,031	4,143	5,125	245	23.70
SECONDARY MARKET							
Fisherman	3	764	-	764	11,230	3,488	-
Faria	1	24	200	224	195	-	-
Bepari	3	374	7,590	7,964	9,052	363	13.70
Nikari	3	188	7,010	7,198	8,655	485	20.20
TERTIARY MARKET							
Fisherman	3	128	-	128	1,900	590	-
Bepari	3	273	4,300	4,573	5,020	149	9.80
Nikari	3	95	11,460	11,555	14,405	950	24.7

Source: FAP 17 Market Survey, 1993

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Table 7.1 Fisherman, *Aratdar* and Retailer Rankings of Reasons for Decline in Fish Production (no. of respondents)

Region	Mkt. Type*	Resp. Type†	First Rank						Second Rank						Third Rank					
			SLT	FCD	OVF	AGC	ILN	FD	SLT	FCD	OVF	AGC	ILN	FD	SLT	FCD	OVF	AGC	ILN	FD
NC	P	1	5	0	0	0	0	0	3	0	0	1	0	0	1	0	0	0	0	0
	P	4	5	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0
	P	7	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
	S	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	S	4	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	S	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	1	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
	T	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	P	1	1	0	0	0	0	0	3	0	3	2	0	0	4	0	0	0	0	0
	P	4	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0
	P	7	1	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	0	0
	S	1	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
	S	4	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	S	7	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0
	T	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
	T	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
NW	P	1	3	1	1	0	0	0	1	1	2	0	0	0	2	2	1	0	0	0
	P	4	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	P	7	4	2	2	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0
	S	1	5	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0
	S	4	1	1	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0
	S	7	2	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0
	T	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	T	4	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
	T	7	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
SW	P	1	3	3	2	0	0	0	1	1	2	0	0	0	0	3	0	0	0	0
	P	4	2	1	0	0	0	0	1	0	0	1	0	0	2	0	0	0	0	0
	P	7	2	0	1	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0
	S	1	0	0	0	0	0	0	1	0	1	1	1	0	2	1	0	0	1	0
	S	4	2	0	0	1	1	0	1	0	1	0	0	0	2	0	0	0	0	0
	S	7	2	0	0	1	0	0	2	0	0	0	1	0	0	0	2	1	0	0
	T	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	7	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

Source: FAP 17 Market Survey, 1993

* Market Type: P = Primary Market, S = Secondary Market, T = Tertiary Market.

† Respondent Type: 1 = Fisherman, 4 = *Aratdar*, 7 = Retailer.

Reasons: SLT = Siltation of river/*khal*/*beel*; FCD = FCD project; OVF = Overfishing; AGC = Agro-chemicals; ILN = Use of illegal fishing net; FD = Fish disease

APPENDIX B

AVERAGE MONTHLY PRICES OF SELECTED SPECIES IN SAMPLE MARKETS, 1993

Table B.1 Average Monthly Prices of Chanda

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	36.7	38.3	36.7	35.0	33.3	33.3	–	–	–	–	–	35.0
Kawranbazar	41.7	43.3	46.7	46.7	33.3	28.3	–	52.5	40.0	–	–	–
Kamalapur	26.7	31.7	38.3	31.7	26.7	26.7	–	–	32.5	–	–	–
North Central Region												
Jhitka	30.0	30.0	33.3	33.3	30.7	28.3	–	–	–	–	–	–
Tora Ghat	–	–	–	–	–	–	16.0	–	–	–	–	–
Jagatnagar	–	–	–	–	–	–	–	22.3	–	–	–	–
Santosh	37.5	40.0	55.0	50.0	–	–	–	–	–	–	–	17.5
Aricha	20.7	26.7	35.0	33.3	28.3	28.3	–	–	–	–	–	–
Manikganj	22.3	23.7	24.7	23.7	26.7	24.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	20.0	20.0	27.3	23.3	18.3	18.3	18.3	10.7	12.0	13.7	15.3	–
Sherpur	17.7	19.0	22.3	23.3	–	–	–	–	17.7	10.0	–	–
Paglabazar	23.3	23.7	31.7	30.0	21.7	21.3	19.0	18.3	16.7	16.3	13.3	22.5
Lamakazi	25.0	25.0	33.3	36.7	31.7	28.3	26.7	23.3	23.3	21.7	23.3	21.5
Moulvibazar	10.3	15.7	18.7	20.0	26.7	22.3	18.3	15.3	15.3	16.7	–	–
Sylhet (Kazibazar)	30.7	30.7	38.3	38.3	28.3	28.3	–	35.7	33.3	20.8	26.0	–
Srimangal	20.0	17.7	16.3	25.7	26.7	22.3	21.3	21.3	21.3	21.7	22.3	–
North West Region												
Karanja C&B Market	25.0	28.3	41.7	45.0	35.0	–	22.5	–	25.0	18.0	19.7	–
Char Boalia	12.3	20.7	–	–	–	–	21.7	12.3	8.3	–	–	–
Bildahar	7.5	11.0	17.5	22.5	–	–	11.0	5.5	7.5	–	–	21.3
Chanchkoir	6.5	7.5	21.0	–	–	21.0	17.5	13.5	11.0	–	–	–
Singra Fish Arat	20.0	17.5	46.0	40.0	28.0	–	20.0	–	–	–	–	–
Natore	15.7	22.3	30.0	–	–	–	–	19.3	7.7	–	–	–
Boral Bridge	12.3	8.3	17.0	21.7	–	22.3	17.0	12.0	8.7	–	–	–
Bogra (Rajabazar)	16.0	–	25.0	30.0	35.0	30.0	12.0	–	–	–	–	–
South West Region												
Ghagar	15.0	15.0	15.7	15.7	15.7	15.0	13.7	13.7	12.0	12.0	–	11.0
Poysar Hat	21.7	–	–	–	–	–	–	–	–	–	–	–
Bhanga	32.3	27.7	–	–	–	22.5	23.3	23.3	31.7	31.7	–	–
Koligram	16.7	22.0	20.7	22.3	20.0	17.3	18.3	16.0	–	15.3	18.3	–
Taker Hat	20.7	25.0	26.7	31.7	28.3	23.3	21.7	21.7	18.3	16.7	16.7	16.7
Madaripur	31.7	33.3	36.7	36.7	36.7	31.7	31.7	26.7	25.0	18.3	17.7	12.3
Faridpur	31.7	36.7	36.7	38.3	38.3	38.3	31.7	26.7	25.0	18.3	21.7	26.7

Source: FAP 17

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Table B.2 Average Monthly Prices of Shol

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	48.3	48.3	48.3	65.0	50.0	48.3	60.0	37.5	–	37.5	38.3	50.0
Kawranbazar	55.0	56.7	58.3	61.7	45.0	90.0	62.5	40.0	50.0	–	–	47.5
Kamalapur	51.7	55.0	58.3	61.7	65.0	85.0	65.0	52.5	67.5	40.0	62.5	70.0
North Central Region												
Jhitka	51.7	52.3	54.0	56.7	58.3	52.3	–	–	–	–	45.0	42.5
Tora Ghat	50.0	47.5	62.5	77.5	52.5	–	–	–	–	–	43.3	35.0
Jagatnagar	55.0	–	–	–	–	–	–	53.3	43.3	41.7	–	–
Santosh	60.0	60.0	70.0	75.0	–	–	–	–	–	–	–	45.0
Aricha	45.0	46.7	48.3	41.7	41.7	36.7	–	–	–	–	–	–
Manikganj	51.7	53.3	53.3	56.7	51.7	51.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	38.3	38.3	43.3	–	38.3	33.3	43.3	29.3	30.7	33.3	42.7	–
Sherpur	41.7	43.3	51.7	55.7	–	–	–	–	41.7	42.3	–	52.3
Paglabazar	56.7	56.7	73.3	61.7	61.7	53.3	51.7	46.7	46.7	45.0	52.5	–
Lamakazi	58.3	58.3	61.7	66.7	61.7	58.3	58.3	56.7	51.7	45.0	41.7	–
Moulvibazar	37.7	38.3	43.3	46.7	56.7	46.7	36.7	33.3	31.7	43.0	–	–
Sylhet (Kazibazar)	95.0	95.0	95.0	95.0	95.0	95.0	95.0	93.3	65.0	65.0	60.0	–
Habiganj	43.3	46.7	48.3	–	43.3	38.3	38.3	26.7	26.7	30.7	35.5	–
Srimangal	30.7	27.7	29.3	43.3	53.3	63.3	51.7	46.0	41.7	43.3	46.8	–
North West Region												
Karanja C&B Market	60.0	43.3	51.7	60.0	53.3	46.7	–	–	–	62.5	55.0	56.7
Char Boalia	33.3	40.0	–	–	–	–	51.7	32.3	62.5	57.5	52.3	50.0
Bildahar	42.5	49.0	52.5	52.5	57.5	58.5	–	–	45.0	42.3	40.0	37.5
Chanchkoir	45.0	45.0	57.5	62.5	60.0	52.5	47.5	37.5	55.0	47.8	50.0	45.0
Singra Fish Arat	48.5	–	–	56.0	56.0	–	–	–	–	–	–	–
Natore	50.0	53.3	60.0	65.0	73.3	79.0	71.7	43.3	38.3	–	–	–
Boral Bridge	41.7	42.3	42.3	46.7	46.7	43.3	35.0	33.3	–	–	–	–
Bogra (Rajabazar)	56.0	70.0	70.0	65.0	70.0	65.0	60.0	–	–	–	–	–
South West Region												
Ghagar	23.8	33.3	36.7	36.7	25.0	25.0	26.7	25.0	28.3	30.7	26.7	25.0
Poysar Hat	33.8	38.3	41.7	41.7	41.7	38.3	38.3	32.3	32.3	36.7	36.3	33.8
Bhanga	36.3	38.3	33.3	41.7	43.3	46.7	46.7	36.7	–	–	46.3	40.0
Koligram	33.8	36.7	38.3	38.3	36.7	33.3	31.7	31.7	–	33.3	36.3	32.5
Taker Hat	41.7	41.7	48.3	53.3	50.7	46.7	43.3	40.7	43.3	41.7	40.0	44.3
Madaripur	56.7	56.7	56.7	61.7	61.7	61.7	61.7	60.0	43.3	43.3	43.3	40.5
Faridpur	53.8	56.7	56.7	63.3	68.3	68.3	–	–	58.3	46.7	40.0	41.7
Gopalganj	38.3	41.7	43.3	48.3	41.7	41.7	43.3	43.3	38.3	37.7	36.7	41.8

Source: FAP 17

Table B.3 Average Monthly Prices of Magur

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	75.0	78.3	81.7	83.3	83.3	70.0	100.0	72.5	72.5	70.0	80.0	80.0
Kawranbazar	90.0	93.3	95.0	96.7	80.0	126.3	72.5	75.0	78.8	–	–	75.0
Kamalapur	91.7	93.3	95.0	93.3	95.0	95.0	82.5	72.5	77.5	–	80.0	67.5
North Central Region												
Jhitka	75.0	63.3	71.7	73.3	73.3	70.0	–	–	–	–	–	110.0
Tora Ghat	55.0	60.0	67.5	85.0	90.0	–	–	–	–	–	75.0	66.3
Jagatnagar	90.0	–	–	–	–	–	–	75.0	58.3	56.7	–	83.3
Santosh	70.0	70.0	80.0	85.0	–	–	–	–	–	–	–	–
Aricha	85.0	85.0	90.0	85.0	85.0	71.7	–	–	–	–	–	–
Manikganj	85.0	88.3	90.0	90.0	85.0	81.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	48.3	48.3	–	–	36.7	40.0	43.3	38.3	43.3	45.0	62.5	–
Sherpur	60.0	62.3	73.3	81.7	–	–	–	–	55.0	55.0	–	61.7
Paglabazar	73.3	71.7	85.0	68.3	73.3	73.3	68.3	63.3	56.7	53.3	67.5	87.5
Lamakazi	51.7	58.3	60.0	66.7	61.7	56.7	56.7	56.7	48.3	48.3	43.3	55.3
Moulvibazar	48.3	55.0	65.0	66.7	73.3	65.0	61.7	55.7	51.7	55.0	–	–
Sylhet (Kazibazar)	81.7	86.7	93.3	96.7	101.7	103.3	106.7	108.3	85.0	87.5	76.7	–
Habiganj	53.3	54.3	56.7	58.3	58.3	53.3	53.3	39.0	33.3	40.0	50.0	–
Srimangal	56.7	51.7	50.7	90.0	90.0	90.0	76.7	71.7	61.7	63.3	78.8	–
North West Region												
Karanja C&B Market	75.0	73.3	95.0	96.7	93.3	76.7	–	–	77.5	77.5	71.7	73.8
Char Boalia	41.7	55.0	–	–	–	–	–	45.0	35.0	–	65.0	60.0
Bildahar	52.5	52.5	55.0	–	–	–	52.5	42.5	62.5	57.5	57.5	68.3
Chanchkoir	55.0	57.5	72.5	85.0	82.5	82.5	67.5	62.5	62.5	61.8	70.0	46.5
Singra Fish Arat	57.0	55.5	63.3	83.5	112.3	73.0	–	–	–	–	–	–
Natore	81.7	83.3	90.0	98.3	106.7	113.3	88.3	66.7	51.7	–	–	–
Boral Bridge	62.3	65.0	75.0	–	–	–	51.7	51.7	31.7	–	–	–
Bogra (Rajabazar)	65.0	–	70.0	90.0	100.0	90.0	70.0	–	–	–	–	–
South West Region												
Ghagar	51.3	55.0	60.0	60.0	50.0	50.0	48.3	48.3	48.3	46.7	45.0	50.0
Poysar Hat	53.8	63.3	66.7	78.3	71.7	66.7	61.7	55.0	50.0	66.7	68.8	63.8
Bhanga	55.0	83.3	83.3	83.3	83.3	105.0	83.3	73.3	61.7	73.3	65.0	66.3
Koligram	55.0	66.7	64.0	64.0	61.7	56.7	53.3	50.7	–	56.7	75.0	53.8
Taker Hat	68.3	68.3	78.3	78.3	73.3	68.3	66.7	66.7	61.7	61.7	61.7	75.0
Madaripur	95.0	96.7	101.7	81.7	81.7	81.7	81.7	81.7	66.7	66.7	66.7	66.7
Faridpur	83.8	98.3	98.3	110.0	108.3	108.3	133.3	130.0	106.7	95.0	85.0	78.3
Gopalganj	90.0	90.0	96.7	125.0	71.7	61.7	58.3	58.3	75.0	75.0	81.7	103.8

Source: FAP 17

Table B.4 Average Monthly Prices of Karfu

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	55.0	56.7	55.0	55.0	51.7	48.3	32.5	42.5	46.7	42.5	45.0	60.0
Kawranbazar	58.3	61.7	61.7	61.7	46.7	70.0	47.5	65.0	50.7	–	–	50.0
Kamalapur	55.0	60.0	65.0	68.3	63.3	70.0	62.5	52.5	46.7	52.5	62.5	67.5
North Central Region												
Jhitka	55.0	55.0	57.0	52.3	53.3	50.0	–	–	–	–	–	–
Tora Ghat	45.0	42.5	50.0	62.5	62.5	–	–	–	–	–	72.5	60.0
Jagatnagar	75.0	–	–	–	–	–	–	41.7	38.3	43.3	–	–
Santosh	–	–	–	–	–	–	–	–	–	–	–	–
Aricha	53.3	53.3	60.7	46.7	41.7	41.7	–	–	–	–	–	–
Manikganj	54.7	56.7	61.7	61.7	51.7	48.3	–	–	–	–	–	–
North East Region												
Sherpur	65.0	65.0	66.7	80.0	–	–	–	–	49.0	49.0	–	63.3
Paglabazar	–	–	–	–	–	–	–	–	–	–	62.0	63.3
Moulvibazar	38.3	43.3	51.7	53.3	66.7	58.3	41.7	38.3	36.7	83.8	–	–
Sylhet (Kazibazar)	43.3	42.3	50.7	52.3	56.7	56.7	56.7	51.7	47.0	63.8	36.7	–
Habiganj	43.3	43.3	46.7	37.7	40.7	40.7	40.7	30.7	33.3	38.3	42.5	–
Srimangal	52.3	41.7	43.3	51.7	70.7	85.0	63.3	51.7	55.0	59.0	66.3	–
North West Region												
Karanja C&B Market	53.3	48.3	53.3	61.7	50.0	41.7	–	–	–	63.0	63.0	55.0
Bildahar	42.5	42.5	47.5	47.5	51.0	53.5	42.5	37.5	17.5	–	–	–
Chanchkoir	31.0	31.0	37.5	42.5	42.5	32.5	56.0	27.5	27.5	–	–	–
Singra Fish Arat	51.0	41.0	55.0	42.3	43.7	44.7	44.7	–	–	–	–	–
Natore	31.7	31.7	33.3	41.7	41.7	48.3	43.3	31.7	28.3	–	–	–
Bogra (Rajabazar)	60.0	65.0	50.0	45.0	50.0	40.0	51.0	–	–	–	–	–
South West Region												
Ghagar	40.0	38.3	40.0	38.3	28.3	28.3	28.3	28.3	30.0	33.3	–	43.0
Poysar Hat	50.0	43.3	46.7	51.7	51.7	48.3	48.3	41.7	41.7	38.3	52.5	51.3
Bhanga	48.8	–	–	–	–	–	–	–	–	–	60.0	51.3
Koligram	37.5	33.3	38.3	38.3	33.3	31.7	31.7	30.0	–	33.7	42.5	41.3
Taker Hat	43.3	43.3	58.3	58.3	46.7	43.3	40.7	36.7	41.7	41.7	41.7	48.3
Madaripur	55.0	55.0	61.7	61.7	61.7	61.7	61.7	61.7	46.7	46.7	56.7	65.0
Faridpur	42.5	53.3	53.3	58.3	68.3	68.3	61.7	58.3	46.7	41.7	41.7	41.7
Gopalganj	46.7	46.7	71.7	78.3	75.0	61.7	51.7	48.3	43.3	50.0	51.7	66.3

Source: FAP 17

Table B.5 Average Monthly Prices of Bailla

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	33.3	36.7	36.7	33.3	31.7	28.3	46.7	27.5	35.0	25.0	–	37.5
Kawranbazar	45.0	48.3	50.0	51.7	40.0	38.3	–	50.0	37.5	–	–	–
Kamalapur	45.0	46.7	46.7	46.7	38.3	35.0	52.5	42.5	35.0	–	–	–
North Central Region												
Jhitka	41.0	42.3	43.3	43.3	36.7	31.7	–	–	59.0	–	52.5	–
Tora Ghat	32.5	27.5	37.0	50.0	42.5	–	–	–	–	–	–	–
Jagatnagar	–	–	–	–	–	–	–	43.3	38.3	31.7	50.0	–
Santosh	47.5	50.0	55.0	52.5	55.0	–	–	–	–	–	–	–
Aricha	33.3	36.7	43.3	38.3	33.3	33.3	–	–	–	–	–	–
Manikganj	40.0	43.7	43.3	43.3	36.7	33.3	–	–	–	–	–	–
North East Region												
Ghater Bazar	–	–	–	–	–	–	–	–	–	–	23.3	–
Sherpur	23.3	30.0	31.0	33.3	–	–	–	–	22.3	17.7	–	–
Lamakazi	–	–	–	–	–	–	–	–	–	–	16.3	18.0
Moulvibazar	12.0	16.7	23.3	25.0	28.3	29.3	23.3	16.7	16.7	17.7	–	–
Sylhet (Kazibazar)	–	–	–	–	–	–	–	–	–	23.5	–	–
Srimangal	22.3	20.7	19.3	32.3	–	–	–	–	–	–	28.3	–
North West Region												
Karanja C&B Market	45.0	55.0	–	–	–	37.5	35.0	–	47.5	24.0	–	–
Char Boalia	20.0	26.7	–	–	–	–	–	23.3	16.3	29.8	–	–
Bildahar	15.5	17.5	22.5	32.5	32.5	33.5	21.0	17.5	13.5	16.7	26.5	26.7
Chanchkoir	11.0	13.0	–	–	–	–	–	–	22.5	22.5	21.0	–
Singra Fish Arat	22.0	20.0	29.5	–	–	–	–	–	–	–	–	–
Natore	–	–	–	25.0	–	–	–	–	19.0	–	–	–
Bogra (Rajabazar)	25.0	14.0	35.0	40.0	45.0	40.0	22.0	–	–	–	–	–
South West Region												
Ghagar	22.3	24.0	25.3	25.3	24.0	21.3	21.3	20.0	18.0	19.3	17.5	22.8
Poysar Hat	32.5	–	–	–	–	21.7	21.7	21.7	21.7	21.7	23.8	30.0
Bhanga	–	–	–	–	–	–	45.0	41.7	41.7	26.7	29.3	28.8
Koligram	–	–	–	–	–	–	–	–	–	–	28.3	–
Taker Hat	–	–	–	–	–	–	–	–	–	–	–	27.3
Madaripur	68.3	68.3	68.3	68.3	51.7	38.3	45.0	45.0	45.0	46.7	41.7	41.7
Faridpur	26.3	–	–	33.3	28.3	33.3	41.7	46.7	48.3	48.3	48.3	48.3
Gopalganj	32.3	33.3	38.3	41.7	38.3	33.3	31.7	31.7	29.0	32.3	32.3	32.3

Source: FAP 17

Table B.6 Average Monthly Prices of Hilsa

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	46.7	50.0	55.0	72.5	51.7	50.0	32.0	40.0	50.0	42.5	50.0	70.0
Kawranbazar	56.7	58.3	63.3	65.0	56.7	110.0	–	–	32.5	–	–	–
Kamalapur	–	–	–	85.0	–	76.7	85.0	–	45.0	37.5	65.0	60.0
North Central Region												
Jhitka	78.3	78.3	73.3	71.7	73.3	63.3	–	–	47.5	–	–	–
Tora Ghat	–	–	–	55.0	–	–	–	–	–	–	–	–
Santosh	–	–	–	–	–	–	–	–	–	–	–	–
Aricha	78.3	78.3	78.3	78.3	76.7	63.3	–	–	–	–	–	–
Manikganj	68.3	70.0	61.7	65.0	63.3	60.0	–	–	–	–	–	–
North East Region												
Moulvibazar	56.7	61.7	63.3	56.7	61.7	48.3	28.3	23.3	26.7	33.0	–	–
Sylhet (Kazibazar)	33.0	42.3	48.3	51.7	58.3	58.3	51.7	35.0	35.0	35.5	30.0	–
Srimangal	–	–	–	81.7	81.7	81.7	35.0	27.7	32.0	–	–	–
North West Region												
Karanja C&B Market	61.7	63.3	71.7	75.0	61.7	53.3	57.5	–	60.0	–	–	–
Bildahar	–	–	–	–	–	–	–	42.5	40.0	–	–	–
Chanchkoir	–	–	–	–	–	–	45.0	37.5	35.0	–	–	–
Natore	30.0	–	–	–	–	–	58.3	46.7	40.0	–	–	–
Bogra (Rajabazar)	65.0	70.0	65.0	65.0	65.0	60.0	55.0	–	–	–	–	–
South West Region												
Ghagar	–	–	–	–	–	–	41.7	38.3	–	–	–	–
Poysar Hat	–	–	–	90.0	76.7	55.0	48.3	35.0	33.3	45.0	60.0	–
Bhanga	–	–	–	77.5	76.7	61.7	51.7	43.3	41.7	48.3	–	–
Taker Hat	–	–	–	–	76.7	76.7	45.0	38.3	36.7	–	–	–
Madaripur	76.7	76.7	76.7	61.7	48.3	46.7	46.7	31.7	31.7	35.0	43.3	55.0
Faridpur	116.3	78.3	78.3	58.3	48.3	48.3	43.3	36.7	31.7	43.3	56.7	75.0
Gopalganj	48.3	48.3	76.7	85.0	41.7	38.3	31.7	28.3	40.0	38.3	46.7	51.8

Source: FAP 17

Table B.7 Average Monthly Prices of Rohu

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	91.7	95.0	96.7	155.0	93.3	90.0	120.0	87.5	136.7	125.0	105.0	125.0
Kawranbazar	100.0	103.3	110.0	113.3	96.7	135.0	91.7	88.8	110.0	–	–	93.3
Kamalapur	95.0	98.3	106.7	113.3	98.3	155.0	105.0	120.0	93.3	52.5	110.0	120.0
North Central Region												
Jhitka	85.0	69.0	71.7	68.3	81.7	90.0	–	–	75.0	–	120.0	90.0
Tora Ghat	76.7	45.0	55.0	65.0	62.5	–	100.0	–	–	–	115.0	81.3
Jagatnagar	–	–	–	–	–	–	–	43.3	41.7	46.7	–	80.5
Santosh	–	–	–	–	–	–	–	–	–	–	–	–
Aricha	85.0	85.0	93.3	83.3	70.0	70.0	–	–	–	–	–	–
Manikganj	86.7	88.3	98.3	98.3	95.0	91.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	44.3	47.7	48.3	48.3	43.3	43.3	45.0	38.3	38.3	43.3	44.0	–
Sherpur	70.0	70.0	71.7	88.3	–	–	–	–	55.0	55.0	–	82.3
Paglabazar	56.7	73.3	95.0	98.3	103.3	95.0	91.7	91.7	73.3	63.3	85.0	–
Lamakazi	58.3	58.3	63.3	68.3	58.3	53.3	53.3	53.3	46.7	43.3	41.7	72.5
Moulvibazar	33.3	41.7	46.7	50.0	63.3	51.7	38.3	33.3	31.7	85.0	–	–
Sylhet (Kazibazar)	70.0	95.0	123.3	126.7	141.7	158.3	165.0	135.0	93.3	103.8	71.7	–
Habiganj	55.0	55.0	58.3	65.0	61.7	56.7	56.7	41.7	43.3	45.7	66.3	–
Srimangal	65.0	60.0	53.3	63.3	78.3	106.7	71.7	62.3	62.3	62.3	73.8	–
North West Region												
Karanja C&B Market	81.7	66.7	71.7	73.3	61.7	48.3	–	–	–	95.0	–	91.7
Char Boalia	25.0	33.3	–	–	–	–	–	–	–	–	67.5	–
Bildahar	55.0	55.0	57.5	62.5	65.0	65.5	52.5	50.0	56.7	62.5	63.8	62.5
Chanchkoir	31.0	35.5	47.5	52.5	45.0	41.0	41.0	32.5	60.0	60.3	65.0	58.3
Singra Fish Arat	39.0	46.0	55.7	78.3	48.3	52.0	51.5	–	–	–	–	–
Natore	38.3	40.7	43.3	48.3	51.7	56.7	46.7	40.0	26.7	–	–	–
Boral Bridge	76.7	40.0	81.7	81.7	71.7	55.0	55.0	45.0	61.7	–	–	–
Bogra (Rajabazar)	90.0	110.0	70.0	65.0	70.0	60.0	–	–	–	–	–	–
South West Region												
Ghagar	75.0	61.7	61.7	61.7	40.0	40.0	40.0	40.0	40.0	46.7	76.3	80.0
Poysar Hat	70.0	61.7	71.7	85.0	85.0	78.3	78.3	81.7	65.0	55.0	82.5	82.5
Bhanga	73.8	76.7	76.7	78.3	76.7	76.7	76.7	61.7	61.7	76.7	85.0	76.3
Koligram	76.7	53.3	58.3	58.3	51.7	48.3	43.3	41.7	–	43.3	75.0	66.3
Taker Hat	63.3	63.3	76.7	76.7	71.7	66.7	61.7	58.3	61.7	58.3	58.3	68.8
Madaripur	121.7	121.7	126.7	103.3	103.3	103.3	103.3	103.3	86.7	86.7	91.7	100.0
Faridpur	90.0	136.7	136.7	136.7	146.7	146.7	145.0	145.0	130.0	123.3	110.0	98.3
Gopalganj	85.0	91.7	106.7	126.7	106.7	91.7	81.7	71.7	65.0	85.0	85.0	123.8

Source: FAP 17

Table B.8 Average Monthly Prices of Gura icha

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	25.7	28.3	30.0	28.3	26.7	23.3	20.0	–	17.5	–	17.5	22.5
Kawranbazar	25.0	26.7	36.7	36.7	20.7	20.7	–	27.5	20.0	–	–	–
Kamalapur	32.3	35.7	36.7	38.3	33.3	32.3	–	17.0	17.5	–	–	22.5
North Central Region												
Jhitka	18.3	20.7	26.7	24.0	22.3	22.3	–	–	10.0	–	4.5	12.3
Tora Ghat	17.5	15.0	32.5	47.5	42.5	–	25.0	–	–	–	11.0	16.0
Jagatnagar	–	–	–	–	–	–	–	23.3	21.7	16.7	5.0	15.0
Santosh	30.0	37.5	47.5	55.0	62.5	–	–	–	–	–	28.8	4.7
Aricha	26.7	26.7	31.7	27.0	23.3	21.7	–	–	–	–	–	–
Manikganj	22.3	24.0	31.7	33.3	26.7	24.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	12.0	14.0	18.3	13.3	11.3	15.0	13.7	7.7	7.7	8.3	8.3	–
Sherpur	12.0	15.3	20.0	22.3	–	–	–	–	15.0	12.3	–	–
Paglabazar	18.3	18.3	21.7	18.3	17.0	15.7	15.3	14.7	14.7	12.0	11.3	26.5
Lamakazi	16.7	18.3	23.3	26.0	23.3	22.3	21.7	21.7	18.3	16.7	10.0	18.8
Moulvibazar	8.3	15.7	18.3	21.0	26.7	22.3	20.0	17.3	14.7	14.7	–	–
Sylhet (Kazibazar)	20.0	21.3	25.7	23.7	22.3	20.7	23.7	24.0	17.7	14.0	13.3	–
Habiganj	19.0	22.3	23.3	13.0	13.0	13.0	13.7	10.7	10.0	8.3	8.3	–
Srimangal	23.0	17.7	16.3	21.7	23.3	28.3	23.3	20.7	19.0	18.3	19.0	–
North West Region												
Karanja C&B Market	26.7	41.7	46.7	51.7	43.3	21.7	18.8	–	–	13.5	12.3	–
Char Boalia	13.0	18.3	–	–	–	–	23.3	9.3	8.5	11.0	13.5	–
Bildahar	5.5	9.0	17.5	22.5	22.5	24.5	22.5	13.5	12.5	–	–	–
Chanchkoir	9.0	11.0	15.5	22.5	15.5	13.5	13.5	11.0	13.5	13.5	–	–
Singra Fish Arat	27.0	31.5	30.0	24.7	32.0	16.0	22.8	–	–	–	–	–
Natore	12.3	19.0	19.0	18.3	22.3	23.3	15.7	12.3	7.0	–	–	–
Boral Bridge	22.3	17.7	12.0	22.3	23.3	21.7	16.7	13.7	10.7	–	–	–
Bogra (Rajabazar)	18.0	20.0	25.0	25.0	30.0	24.0	14.0	–	–	–	–	–
South West Region												
Ghagar	23.3	23.3	23.3	22.0	20.7	20.7	20.7	18.7	18.7	19.3	23.3	19.3
Poysar Hat	23.3	22.3	23.3	33.3	25.0	23.3	23.3	18.0	18.0	15.3	23.3	15.5
Bhanga	21.7	21.7	18.3	21.7	28.3	31.7	21.7	16.7	16.7	16.7	18.3	20.8
Koligram	12.3	16.3	19.3	19.3	18.3	16.0	15.0	15.0	–	13.0	14.0	8.0
Taker Hat	21.7	25.0	23.3	28.3	23.3	22.3	21.3	20.7	20.7	19.3	23.3	23.3
Madaripur	21.7	26.7	26.7	19.3	17.3	17.3	17.3	17.3	16.3	16.3	19.3	20.7
Faridpur	21.7	26.7	26.7	18.7	16.7	16.7	20.7	16.7	16.7	21.7	26.7	35.0
Gopalganj	36.7	36.7	41.7	51.7	33.3	33.3	30.0	30.0	33.3	33.3	23.3	23.3

Source: FAP 17

Table B.9 Average Monthly Prices of Golda

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	306.7	316.7	310.0	306.7	310.0	273.3	237.5	230.0	260.0	230.0	276.7	310.0
Kawranbazar	320.0	350.0	340.0	–	–	210.0	–	80.0	100.0	–	–	–
Kamalapur	323.3	323.3	323.3	318.3	326.7	303.3	180.0	–	300.0	400.0	225.0	250.0
North Central Region												
Jhitka	–	–	–	–	–	113.3	–	–	–	–	–	–
Tora Ghat	–	–	–	146.0	–	–	–	–	–	–	–	–
Aricha	–	–	–	–	–	95.0	–	–	–	–	–	–
Manikganj	–	–	–	–	–	150.0	–	–	–	–	–	–
North East Region												
Sherpur	190.0	193.3	200.0	206.7	–	–	–	–	175.0	175.0	–	183.0
Sylhet (Kazibazar)	–	–	–	–	–	–	–	–	–	270.0	–	–
North West Region												
Karanja C&B Market	–	–	–	–	–	–	–	–	300.0	–	–	–
Boral Bridge	–	–	–	–	–	–	–	126.7	153.3	–	–	–
South West Region												
Ghagar	175.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0
Poysar Hat	255.0	255.0	255.0	255.0	255.0	255.0	255.0	255.0	255.0	255.0	255.0	255.0
Bhanga	260.0	358.3	358.3	358.3	358.3	358.3	358.3	358.3	358.3	358.3	358.3	356.7
Koligram	–	–	–	–	–	–	–	–	–	–	377.5	–
Taker Hat	373.3	373.3	373.3	373.3	373.3	373.3	373.3	373.3	373.3	373.3	373.3	373.3
Madaripur	275.0	275.0	275.0	275.0	275.0	275.0	275.0	275.0	273.3	273.3	273.3	273.3
Faridpur	257.5	–	–	–	–	–	–	–	–	–	–	–
Gopalganj	275.0	275.0	275.0	275.0	275.0	275.0	275.0	275.0	275.0	275.0	275.0	275.0

Source: FAP 17

Table B.10 Average Monthly Prices of Tara baim

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	36.7	38.3	43.3	43.3	41.7	40.0	–	–	–	–	55.0	–
Kawranbazar	46.7	46.7	48.3	48.3	36.7	33.3	–	45.0	–	–	–	–
Kamalapur	40.0	41.7	41.7	43.3	41.7	40.0	–	–	–	–	–	–
North Central Region												
Jhitka	39.3	39.3	42.3	42.3	39.0	34.3	–	–	–	–	–	35.0
Tora Ghat	20.0	20.0	37.5	57.5	52.5	–	28.0	–	–	–	21.0	11.0
Jagatnagar	45.0	–	–	–	–	–	–	45.0	33.3	31.7	–	–
Santosh	62.5	62.5	–	–	–	–	–	–	–	–	–	43.3
Aricha	40.0	40.0	41.7	43.3	38.3	36.7	–	–	–	–	–	–
Manikganj	38.3	38.3	41.7	38.3	36.7	36.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	26.3	26.3	32.3	–	–	26.7	21.7	16.7	18.3	23.3	25.0	–
Sherpur	22.3	24.0	27.7	31.7	–	–	–	–	22.3	22.3	–	–
Paglabazar	33.3	41.7	43.3	36.7	36.7	33.3	31.7	29.0	28.3	23.3	21.7	–
Lamakazi	38.3	43.3	46.7	48.3	43.3	41.7	36.7	36.7	28.3	26.7	23.3	30.0
Moulvibazar	20.7	28.3	31.7	33.3	36.7	41.7	28.3	23.3	21.7	21.7	–	–
Sylhet (Kazibazar)	42.3	47.7	50.7	52.3	52.3	46.7	40.7	41.3	35.0	22.8	29.3	–
Habiganj	29.0	32.3	33.3	–	33.3	31.7	31.7	20.0	19.3	17.7	20.0	–
Srimangal	27.7	23.7	20.7	–	50.0	53.3	43.3	33.3	22.3	23.3	31.7	–
North West Region												
Karanja C&B Market	41.7	43.3	51.7	53.3	46.7	28.3	30.0	–	42.7	–	42.3	–
Char Boalia	22.3	28.3	–	–	–	–	31.7	18.3	20.0	–	–	–
Bildahar	22.5	27.5	27.5	32.5	37.5	37.5	47.5	42.5	37.5	–	–	–
Chanchkoir	21.0	22.5	37.5	47.5	42.5	41.5	32.5	27.5	27.0	–	27.5	22.3
Singra Fish Arat	34.0	34.0	33.5	45.3	46.0	–	–	–	–	–	–	–
Natore	40.0	43.3	45.7	51.7	60.0	61.7	51.7	39.0	30.7	–	–	–
Boral Bridge	32.3	22.3	32.3	36.7	38.3	33.3	31.7	21.7	25.0	–	–	–
Bogra (Rajabazar)	30.0	40.0	45.0	45.0	–	–	–	–	–	–	–	–
South West Region												
Ghagar	17.0	18.7	22.3	22.3	21.0	21.0	21.0	20.0	20.0	19.3	32.5	28.8
Poysar Hat	25.0	25.0	28.3	31.7	–	–	–	–	22.3	26.7	35.0	31.3
Bhanga	36.3	36.7	36.7	41.7	43.3	50.0	41.7	36.7	26.7	26.7	32.5	33.8
Koligram	26.3	27.7	28.7	28.7	27.0	23.3	21.7	21.7	–	20.7	37.5	32.5
Taker Hat	33.3	36.7	33.3	40.0	33.3	31.7	26.7	22.3	28.3	27.3	26.7	26.7
Madaripur	41.7	46.7	46.7	53.3	53.3	53.3	53.3	43.3	41.7	36.7	30.7	21.7
Faridpur	38.3	48.3	48.3	58.3	68.3	68.3	–	–	41.7	36.7	36.7	36.7
Gopalganj	25.7	28.3	43.3	50.0	38.3	36.7	31.7	31.7	31.7	36.7	25.7	25.7

Source: FAP 17

Table B.11 Average Monthly Prices of Tengra

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	35.0	38.3	40.0	40.0	35.0	30.0	50.0	32.5	26.7	27.5	22.0	22.5
Kawranbazar	40.7	51.7	53.3	53.3	41.7	40.0	37.7	32.3	21.7	–	–	37.5
Kamalapur	33.3	38.3	40.0	41.7	55.0	55.0	37.5	35.0	26.7	17.5	22.5	25.0
North Central Region												
Jhitka	34.3	41.7	42.3	44.0	43.3	40.7	–	–	86.7	–	21.0	31.0
Tora Ghat	40.0	37.5	47.5	72.5	65.0	–	29.0	–	–	–	45.0	40.0
Jagatnagar	55.0	–	–	–	–	–	–	51.7	43.3	35.0	50.0	42.5
Santosh	60.0	65.0	77.5	75.0	–	–	–	–	–	–	–	–
Aricha	35.0	41.7	42.3	43.7	43.3	43.3	–	–	–	–	–	–
Manikganj	34.3	41.7	43.0	44.3	42.7	41.0	–	–	–	–	–	–
North East Region												
Ghater Bazar	33.3	36.3	43.3	38.3	33.3	32.3	31.7	20.7	20.7	21.7	31.3	–
Sherpur	31.7	34.0	34.0	39.0	–	–	–	–	26.7	22.3	–	33.3
Paglabazar	25.3	33.3	36.7	46.7	23.3	20.7	20.7	19.3	18.3	18.7	23.3	39.0
Lamakazi	28.3	33.3	38.3	48.3	50.0	43.3	33.3	28.3	23.3	23.3	25.0	34.0
Moulvibazar	15.3	23.3	26.7	28.3	38.3	27.3	23.3	18.3	18.3	22.3	–	–
Sylhet (Kazibazar)	29.0	39.3	42.3	40.0	22.3	23.3	35.0	31.7	23.3	23.3	19.3	–
Habiganj	33.3	33.3	36.7	42.3	42.3	37.7	37.7	27.7	26.7	27.7	27.7	–
Srimangal	32.3	31.3	30.0	45.0	40.7	46.7	41.7	38.3	33.3	36.7	39.0	–
North West Region												
Karanja C&B Market	60.0	55.0	63.3	71.7	68.3	58.3	51.7	–	41.7	40.3	35.0	26.7
Char Boalia	25.0	41.7	–	–	–	–	75.0	43.3	23.5	30.0	30.7	25.0
Bildahar	32.5	37.5	42.5	47.5	51.0	52.5	42.5	37.5	35.0	30.5	26.7	23.7
Chanchkoir	31.0	32.5	42.5	57.5	52.5	53.5	52.5	42.5	45.0	36.8	34.3	34.3
Singra Fish Arat	51.0	46.3	47.3	59.0	70.3	98.3	70.0	–	–	–	–	–
Natore	41.7	43.3	48.3	53.3	56.7	62.3	43.3	38.3	31.7	–	–	–
Boral Bridge	26.7	15.0	41.7	50.0	53.3	43.3	33.3	26.7	23.3	–	–	–
Bogra (Rajabazar)	45.0	32.0	50.0	70.0	90.0	75.0	62.5	–	–	–	–	–
South West Region												
Ghagar	22.3	25.3	28.3	30.0	30.0	26.7	23.3	22.3	22.3	20.0	26.3	27.5
Poysar Hat	28.3	28.3	31.7	–	33.3	33.3	33.3	33.3	33.3	30.7	35.0	31.3
Bhanga	43.8	41.7	31.7	53.3	53.3	61.7	53.3	36.7	31.7	26.7	40.0	33.8
Koligram	27.7	33.0	36.7	38.3	33.3	31.7	31.7	28.3	–	22.3	31.3	22.5
Taker Hat	31.7	38.3	43.3	43.3	43.3	38.3	38.3	38.3	33.3	31.7	28.3	28.3
Madaripur	41.7	51.7	51.7	51.7	55.0	55.0	48.3	41.7	36.7	31.7	38.3	45.0
Faridpur	48.3	53.3	53.3	61.7	68.3	68.3	53.3	45.0	36.7	33.3	35.0	35.0
Gopalganj	41.7	46.7	51.7	75.0	61.7	51.7	38.3	38.3	36.7	45.0	41.7	41.7

Source: FAP 17

Table B.12 Average Monthly Prices of Tilapia

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	45.0	45.0	45.0	41.7	41.7	40.0	29.0	27.5	30.0	27.5	25.0	27.5
Kawranbazar	35.0	38.3	40.0	41.7	36.7	33.3	30.0	30.0	–	–	–	32.5
Kamalapur	35.0	38.3	40.0	41.7	43.3	41.7	37.5	35.0	37.5	21.0	27.5	32.5
North Central Region												
Jhitka	40.7	41.3	41.7	41.7	38.3	38.3	–	–	–	–	–	–
Tora Ghat	27.5	25.0	32.5	42.5	37.5	–	–	–	–	–	23.0	27.5
Jagatnagar	36.3	–	–	–	–	–	–	36.7	35.0	33.3	–	–
Santosh	50.0	–	–	–	–	–	–	–	–	–	42.5	32.3
Aricha	38.3	38.3	41.7	41.7	41.0	38.3	–	–	–	–	–	–
Manikganj	37.7	41.7	41.7	41.7	40.7	36.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	–	–	–	–	–	–	–	–	–	–	27.0	–
Sherpur	23.3	24.0	29.0	32.3	–	–	–	–	26.7	23.7	–	–
Lamakazi	–	–	–	–	–	–	–	–	–	–	27.0	28.0
Moulvibazar	20.7	27.3	28.3	33.3	31.7	32.3	26.7	22.3	26.7	26.7	–	–
Sylhet (Kazibazar)	42.3	45.7	43.3	44.0	36.7	31.7	45.0	35.0	36.7	25.5	36.7	–
Srimangal	35.0	33.0	32.0	41.7	40.7	41.7	41.7	41.7	38.3	38.3	39.0	–
North West Region												
Karanja C&B Market	26.7	31.7	46.7	53.3	45.0	30.0	27.5	–	35.7	30.0	32.3	33.3
Char Boalia	–	–	–	–	–	–	–	–	–	–	32.5	–
Bildahar	22.5	25.5	27.5	32.5	36.0	36.5	22.5	15.5	15.5	–	–	–
Chanchkoir	–	–	21.0	27.5	25.0	27.5	21.0	17.5	13.0	–	–	–
Singra Fish Arat	30.0	41.0	39.3	37.0	47.0	20.7	33.7	–	–	–	–	–
Natore	18.3	24.0	25.0	–	32.3	31.7	26.7	20.0	12.3	–	–	–
Bogra (Rajabazar)	32.0	22.0	40.0	45.0	50.0	50.0	33.5	–	–	–	–	–
South West Region												
Ghagar	22.3	23.7	24.7	24.7	22.0	22.0	22.0	22.0	22.0	22.0	18.8	21.5
Poysar Hat	23.3	26.7	28.3	33.3	33.3	33.3	33.3	26.7	26.7	26.7	26.3	28.8
Bhanga	42.3	36.7	36.7	46.7	46.7	46.7	46.7	46.7	33.3	33.3	30.0	–
Taker Hat	38.3	41.7	41.7	41.7	41.7	36.7	35.0	35.0	31.7	31.7	35.0	35.0
Madaripur	38.3	43.3	43.3	45.0	38.3	38.3	36.7	36.7	36.7	31.7	39.0	42.3
Faridpur	38.3	43.3	43.3	48.3	48.3	48.3	48.3	48.3	40.0	33.3	33.3	36.7
Gopalganj	40.0	43.3	55.0	65.0	53.3	53.3	43.3	43.3	40.0	42.3	38.3	38.3

Source: FAP 17

Table B.13 Average Monthly Prices of Pangas

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	95.0	103.3	105.0	155.0	101.7	95.0	105.0	85.0	163.3	95.0	88.8	115.0
Kawranbazar	131.7	136.7	136.7	121.7	95.0	95.0	–	–	–	–	–	–
Kamalapur	121.7	126.7	130.0	125.0	111.7	100.0	115.0	122.5	140.0	95.0	105.0	105.0
North Central Region												
Jhitka	110.0	110.0	123.3	106.7	93.3	91.7	–	–	–	–	–	–
Aricha	110.0	120.0	121.7	115.0	100.0	96.7	–	–	–	–	–	–
Manikganj	113.3	121.7	120.7	103.3	100.0	96.7	–	–	–	–	–	–
North East Region												
Sherpur	103.3	106.7	110.0	116.7	–	–	–	–	95.0	88.3	–	94.7
Moulvibazar	93.3	96.7	100.0	106.7	116.7	103.3	93.3	76.7	91.7	98.8	–	–
Sylhet (Kazibazar)	83.3	92.3	110.0	121.7	145.0	155.0	155.0	155.0	95.0	101.3	91.7	–
Srimangal	98.3	111.7	118.3	123.3	136.7	136.7	85.0	85.0	95.0	95.0	115.0	–
North West Region												
Bogra (Rajabazar)	110.0	110.0	120.0	–	–	–	–	–	–	–	–	–
South West Region												
Poysar Hat	91.7	–	91.7	91.7	81.7	81.7	81.7	81.7	81.7	90.0	90.0	93.8
Bhanga	–	–	–	–	–	83.3	103.3	93.3	90.0	–	–	–
Madaripur	123.3	136.7	143.3	110.0	100.0	100.0	100.0	91.7	91.7	91.7	91.7	116.3
Faridpur	117.5	153.3	153.3	115.0	106.7	106.7	116.7	96.7	96.7	95.0	116.7	126.7
Gopalganj	85.0	91.7	123.3	150.0	130.0	123.3	98.3	98.3	101.7	101.7	91.7	112.5

Source: FAP 17

Table B.14 Average Monthly Prices of Punti

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	28.3	31.7	33.3	31.7	28.3	26.7	–	22.5	22.5	16.0	17.8	20.0
Kawranbazar	28.3	39.0	40.7	40.0	32.3	31.7	21.0	32.5	20.0	–	–	22.5
Kamalapur	21.7	29.0	31.7	31.7	33.3	41.7	27.5	22.5	14.3	16.5	29.3	37.5
North Central Region												
Jhitka	26.7	31.7	32.3	31.7	31.7	28.3	–	–	–	–	22.5	18.8
Tora Ghat	32.5	27.5	37.5	47.5	42.5	–	30.0	–	–	–	20.8	22.3
Jagatnagar	17.5	–	–	–	–	–	–	31.7	25.0	18.3	25.0	22.5
Santosh	45.0	45.0	65.0	65.0	65.0	–	–	–	–	–	28.8	23.3
Aricha	25.0	32.3	33.3	33.3	31.7	28.3	–	–	–	–	–	–
Manikganj	31.7	31.7	32.3	33.3	28.3	28.3	–	–	–	–	–	–
North East Region												
Ghater Bazar	23.3	27.3	29.0	29.0	23.3	21.7	21.7	13.3	13.3	16.7	24.0	–
Sherpur	22.3	23.3	26.7	30.7	–	–	–	–	22.3	17.0	–	19.7
Paglabazar	22.3	23.7	33.3	38.3	20.7	18.3	16.7	15.3	15.0	14.7	17.3	36.0
Lamakazi	21.7	26.7	31.7	40.0	43.3	38.3	28.3	26.7	21.7	21.3	21.8	28.7
Moulvibazar	13.0	18.3	21.7	23.3	26.7	26.7	21.7	17.0	16.7	16.7	–	–
Sylhet (Kazibazar)	25.0	33.3	38.3	38.3	22.3	22.3	35.0	29.3	21.7	22.8	18.0	–
Habiganj	28.3	28.3	31.7	33.3	33.3	33.3	33.3	20.7	20.7	19.0	19.0	–
Srimangal	26.7	23.3	22.3	35.0	38.3	41.7	33.3	31.7	28.3	22.0	25.0	–
North West Region												
Karanja C&B Market	40.0	48.3	51.7	61.7	51.7	40.0	32.5	–	27.5	17.7	16.0	13.0
Char Boalia	12.3	22.3	–	–	–	–	31.7	23.3	13.5	17.7	16.3	12.3
Bildahar	11.0	13.0	21.0	–	–	–	22.5	13.0	14.0	18.3	15.0	12.3
Chanchkoir	15.5	17.5	27.5	37.5	32.5	34.5	31.0	21.0	27.5	22.3	17.7	15.3
Singra Fish Arat	12.0	18.5	35.0	–	26.0	28.0	12.0	–	–	–	–	–
Natore	23.3	28.3	30.7	33.3	35.0	41.7	28.3	23.3	17.7	–	–	–
Boral Bridge	22.3	12.0	25.0	31.7	–	28.3	21.7	17.0	14.0	–	–	–
Bogra (Rajabazar)	28.0	14.0	25.0	35.0	30.0	20.0	27.0	–	–	–	–	–
South West Region												
Ghagar	16.3	19.3	20.7	20.7	15.0	15.3	14.3	13.0	13.0	12.7	13.0	14.5
Poysar Hat	18.3	20.7	23.3	–	21.7	21.7	20.7	18.0	18.0	15.3	20.0	17.5
Bhanga	22.8	28.3	25.0	36.7	36.7	41.7	31.7	21.7	16.7	16.7	16.8	18.0
Koligram	22.3	25.0	26.7	30.0	27.0	24.0	24.0	21.7	–	18.3	21.0	21.3
Taker Hat	28.3	33.3	38.3	38.3	31.7	26.7	23.3	23.3	17.0	17.0	21.7	23.3
Madaripur	21.7	36.7	36.7	36.7	41.7	41.7	36.7	31.7	23.3	21.7	21.7	18.0
Faridpur	28.3	38.3	38.3	41.7	48.3	41.7	41.7	31.7	28.3	21.7	23.3	23.3
Gopalganj	22.3	28.3	36.7	40.7	36.7	31.7	25.0	21.7	18.3	17.7	21.7	21.7

Source: FAP 17

Table B.15 Average Monthly Prices of Boal

Market name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dhaka City												
Swarighat	66.7	68.3	68.3	85.0	71.7	65.0	80.0	62.5	80.0	60.0	68.3	70.0
Kawranbazar	66.7	71.7	81.7	85.0	56.7	55.0	75.0	69.0	47.5	–	–	76.7
Kamalapur	55.0	60.0	65.0	70.0	71.7	85.0	65.0	72.5	62.5	50.0	70.0	70.0
North Central Region												
Jhitka	85.0	66.7	68.3	73.3	66.7	61.7	–	–	–	–	47.5	75.0
Tora Ghat	60.0	50.0	72.5	95.0	92.5	–	–	–	–	–	78.8	61.3
Jagatnagar	72.5	–	–	–	–	–	–	60.0	51.7	48.3	–	65.0
Santosh	77.5	77.5	–	85.0	–	–	–	–	–	–	–	–
Aricha	56.7	58.3	63.3	60.0	58.3	53.3	–	–	–	–	–	–
Manikganj	61.7	66.7	66.7	73.3	68.3	61.7	–	–	–	–	–	–
North East Region												
Ghater Bazar	43.3	43.3	48.3	–	–	43.3	43.3	33.3	33.3	39.0	45.0	–
Sherpur	43.3	46.7	52.3	56.7	–	–	–	–	42.3	43.3	–	61.8
Paglabazar	56.7	56.7	73.3	61.7	61.7	56.7	53.3	46.7	46.7	45.0	75.0	–
Lamakazi	56.7	56.7	61.7	65.0	61.7	58.3	58.3	56.7	51.7	46.7	43.3	66.0
Moulvibazar	36.7	42.3	46.7	48.3	60.0	46.7	36.7	32.3	31.7	52.8	–	–
Sylhet (Kazibazar)	73.3	72.3	85.0	85.0	93.3	93.3	91.7	93.0	65.0	73.8	60.0	–
Habiganj	48.3	49.7	50.7	35.0	40.0	43.3	43.3	30.7	31.7	33.3	40.5	–
Srimangal	43.3	40.7	38.3	75.0	71.7	63.3	58.3	53.3	59.0	60.0	60.0	–
North West Region												
Karanja C&B Market	80.0	63.3	76.7	81.7	78.3	68.3	–	–	85.0	80.0	70.0	66.7
Char Boalia	31.7	43.3	–	–	–	–	58.3	36.7	31.7	–	55.0	51.7
Bildahar	37.5	41.0	42.5	52.5	56.0	56.5	37.5	32.5	52.5	50.5	49.5	46.8
Chanchkoir	31.0	32.5	42.5	52.5	52.5	51.0	42.5	35.5	57.5	45.7	55.0	45.0
Singra Fish Arat	46.0	61.5	45.7	56.7	73.0	91.3	72.0	–	–	–	–	–
Natore	40.0	40.0	48.3	53.3	73.3	76.7	61.7	45.0	31.7	–	–	–
Boral Bridge	45.0	52.3	51.7	63.3	63.3	51.7	46.7	41.7	60.0	–	–	–
Bogra (Rajabazar)	45.0	45.0	50.0	80.0	85.0	70.0	75.0	–	–	–	–	–
South West Region												
Ghagar	77.5	55.0	56.7	56.7	45.7	45.7	44.0	43.3	43.3	41.7	48.8	52.5
Poysar Hat	42.5	61.7	63.3	68.3	68.3	63.3	63.3	55.0	56.7	61.7	65.0	57.5
Bhanga	58.8	61.7	61.7	66.7	66.7	71.7	71.7	61.7	61.7	61.7	65.0	55.0
Koligram	47.5	43.3	48.3	46.7	43.3	38.3	36.7	36.7	–	36.7	56.7	63.8
Taker Hat	51.7	51.7	63.3	66.7	63.3	63.3	56.7	51.7	48.3	48.3	51.7	65.0
Madaripur	71.7	81.7	91.7	71.7	71.7	71.7	71.7	66.7	–	63.3	61.7	53.0
Faridpur	77.5	91.7	95.0	78.3	98.3	98.3	98.3	88.3	78.3	78.3	70.0	68.3
Gopalganj	66.7	68.3	71.7	78.3	71.7	71.7	66.7	66.7	66.7	65.0	65.0	76.3

Source: FAP 17

APPENDIX C

QUESTIONNAIRES USED IN THE STUDY

FAP 17 STUDY

Form: MS01 Information on market characteristics and infrastructures.

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Region code	Mkt type	Mkt Sl. No

1. Market identification code

1.1 Name of market (village)_____ 1.2 Union _____

1.3 Thana _____ 1.4 Dist. _____

2. Nature of market code

Codes: 1. Collection point; 2. Hat; 3. Bazar; 4. Bazar cum Hat.

3. Occurrence frequency:

Day/Time	S	S	M	T	W	TH	F	daily
Morning								
Afternoon								
Evening								

4.Is fish market a part of a general market? Y | N

5. Market area:

5.1 Total market area (L. m x W. m) _____

5.2 Total area of fish market/ section (L. m x W. m) _____

5.2.1 Coverd area(L. m X W.m) _____

5.2.2 Open area (L. m x W. m) _____

5.2.3 Permanent sheds(number) _____

5.2.4 Shed Type code

Shed codes: 1. Tin shed; 2. Bamboo & thached; 3. Tin shed with pucca floor; 4. Building.

(MAP OF MARKET)

6. Infrastructures:

6.1 Number of ice factory/ plants supplying ice for the market _____

6.1.2 Distance of ice factory from the market and capacity:

Distance	Number	Capacity(mt
Within 1 km.		
1 km. to 5 km.		
6 km. to 10 km.		

6.2 Landing platform: (Number) _____

6.2.1 Unit size (L. m. x W. m.) _____

6.2.2 Platform Type code

Type codes: 1. Wooden; 2. Concrete.

6.3 Retailing facilities: code

Codes: 1. Sheds & adequate; 2. Sheds,but inadequate; 3. Open area.

6.4 Wholesaling facilities: code

Codes: 1. water supply & storing; 2. Water supply, but no storing; 3.No water supply & storing.

6.5 Weighing system: code

Codes: 1. Metric system; 2. Traditional system; 3. Lot; 4. Metric system & lot.

6.6 Bankig facilities exist: Y | N

6.7 Telephone & communiction facilities available: Y | N

6.8 Sorting & grading system exists: Y | N

(If yes, describe)

7. Package Type used:

Package type	% of traders using
Metalic drum	
Wooden box	
Bamboo basket	

8. Natural material used in package:code ☐ ☐ ☐
Codes: 1. Hogla leaves; 2. Banana leaves; 3.Water hyacinth.

9. Average daily number of consumers and traders attending fish market and volume of fish exported during peak & lean period.

Indicator	Number	
	Peak Period	Lean Period
	mo( )	mo( )
Fisherman		
Faria		
Bepari		
Paikar		
Chalani		
Arotdar		
Nikari/Retailer		
Consumer		
Export volume		

10. Linkages of this market to fishing grounds/other markets.

Fishing Grounds		
Name	Union	Thana

Market acting as source of supply		
Name	Union	Thana

Destination markets		
Name	Union	Thana

11. Use of transportation modes in inward and outward movement of fish of the market.

Transport mode	% of total import	% of total export
Head load		
Boat		
Mechanized boat		
Rickshaw van		
Bus		
Truck		
Railway		

Investigator	
Date	| | 93

FAP 17 STUDY

Form: MS 02 Information on fish market functionaries

(Form MS 02 to be used for interviewing Faria/Bepari/Paikar/Chalani seperately.)

1. Respondent's Identification : code	Region	Market type	Market Sl	Resp type	Resp. Sl.

1.1 Name of Respondent _____ 1.3.Age____

1.2 Father's name _____ 1.4 Religion _____

1.5 Residence code

Res. codes: 1. Village; 2. Union; 3. Thana; 4. Dist.; 5. Outside [with ref.to market]

2. How many markets do you operate at? (number)

3. How long have you been engaged in fish trade? (yrs)

4. What is the period of your involvement in fish trade ? (code)

codes: 1. Throughout the year; 2. Beel harvesting period; 3. Pond harvesting period;
4. Beel and pond harvesting period;

5. If you are part–time in fish trade, what do you do during the rest of the year?

code

Secondary Occupation codes: 1. Fishing; 2. Fish fry trade; 3. Fish net trade;
4. Agriculture; 5. Other.

6. What was the daily average quantity of fish traded by you during the peak and lean periods last year ?

Period	Quantity in kg. and Price in Taka/kg.													
	major carp		Exotic carp		Snake head		other L.Sp.		Live fish		Small fish		Hilsa	
	Qy	Price	Qy	Price	Qy	Price	Qy	Price	Qy	Price	Qy	Price	Qy	Price
Peak(m:														
Lean(m:														

7. State the sources of supply of your fish :

Supply source	% of total supply	
	peak period	lean period
Own		
Fisherman		
Faria		
Bepari		
Fish coop		
Arotdar		

8. Do you sell to selected parties ? Y | N

9. If yes, state the main reason. code

Reason codes: 1.Taken advance; 2. Kinship; 3. Taken advance and kinship;
4.Offer better price; 5. Provide additional services;
6. Offer better price and additional services; 7. Mutual trust.

10. How many days do you require to complete one chalan ? code
Codes : 1. One day; 2. Two days; 3. Three days; 4. Four days; 5. Five days.

11. What is the amount of money required for one chalan ? Tk.

12. What is the source of your working capital ?

source	amount(Tk)	Remark
Own		
Partners		
Credit		
Total		

13. What are the sources and amounts of credit taken ?

source	amount (Tk.)	condition	
		interest%	period
Bank			
Mahajan			
Arotdar			
Bepari			
Coop			
Friend/Reln			

14. In what mode of transportation, you experienced major losses during the last five years? code

15. State major cause of loss: code
Causes of loss codes: 1. Long time; 2. Transport break down;
3. Preservation difficulties; 4. Extortion by third parties.

16. What is your suggestion for the improvement of fish transportation ?

17. What are the marketing costs incured by you at buying point and this market for today's chalan ?
(UseForm: MS03)

18. What are the quantities and prices of fish bought/sold by you to-day ?
(Use Form: MP01)

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Investigator	
Date	| |93

FAP 17 STUDY

Form: MS 03 Information on Marketing Cost

1.Respondent's name_____ 1.1 Sl. No _____

2. Indicate Buying point: code [ ]

Buying point codes: 1. Fishing ground; 2.Primary market; 3. Secondary market; 4. Tertiary market.

3. Name of buying point/market_____ Union_____ Thana_____

4. Costs at Buying Point. Tk./Day

Market charges

Market toll _____

Sweeper charge _____

Subscription to association _____

Donations ,tips, etc. _____

Personal expenses _____

_____

Packaging & processing costs

material	Useful life(days)	Tk./piece
metalic drum		_____
bamboo busket		_____
jute bag		_____
polythene paper		_____

Other costs Tk./Day

labour charge _____

Ice cost (Qy= Kg) _____

Nail, rope,etc. _____

5.Transportation Cost.

Transport Mode	Distance covered(km	Time(hrs)	Hire charge Tk./day
Head load			
Boat /Mechanized boat			
Rickshaw van			
Bus			
Truck			
Railway			

Other charge Tk./day

Bill charge _____

Ferry charge _____

Porter charge _____

6. Indicate selling point type. code [ ]

1. Same market; 2. Other market,same type; 3. Higher market.

7. Name of selling point/market_____ 6.1 Thana_____

8. Costs at Selling Point. Tk./day

Market toll _____

Water charge _____

Sweeper charge _____

Icing cost (Qy= kg.) _____

Subscription to association _____

Donations,tips etc. _____

Boarding charge _____

Banking charges _____

Arot's 'kuli' charge _____

Other(specify) _____

_____

9. Arotdar's Commission. _____% _____

Investigator	
Date	93

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FAP 17 STUDY

Form: MS 04 Information on fish market Arotdari System.

(Form MS 04 to be used for collection of information from arotdars.)

	Rgn	Mkt Type	Mkt Sl	Res. Yype	Res Sl
Code					

1. Respondent's Identification:

1.1 Name of Respondent _____ 1.3.Age _____

1.2 Father's name _____ 1.4 Religion _____

1.5 Residence code

Res. codes: 1. Village; 2. Union; 3. Thana; 4. Dist.; 5. Outside (with ref.to market)

2. How long have you been engaged in arotdari? (Yrs)

3. Was your father an arotdar ? Y N

4. Are any of your brothers arotdar ? Y N

5. What was the daily average quantity of fish traded by your arot during the peak and lean periods last year ? [Use seasonality chart]

	Quantity in kg and Price in Taka /kg.													
Period	Major carp		Exo. carp		S. head		Other L.sp		Live fish		Small fish		Hilsa	
	Qy	P	Qy	P	Qy	P	Qy	P	Qy	P	Qy	P	Qy	P
Peak( )														
Lean ( )														

6. From whom do you get your supply of fish?

Supply Source	% of total purchase	
	peak period	Lean period
Fisherman		
Faria		
Bepari		
Fish coop		
Other Arotdar		

7. If there has been any change in average volume of your business in last 5 years, indicate the change:

Indicator	%increase	%decrease
Volume of trade		
Income		

8.State reasons for the change with ranking:

Reason for change in trade volume	Ranking
Change in fish availabity	
Change in demand	
Change in market competition	
Higher investment need	

Reasons for income change	Ranking
Change in Quantity	
Change in Demand	
High profit	
Low profit	

9. Has fish availability reduced in last 5 years ? Y N

10. If yes, State reasons with ranking:

Reasons	Ranking
Siltation of river/ khal/ beel	
FCD projects	
Over–fishing	
Use of agro– chemicals	
Use of illegal fishing nets	
Fish disease	
Other (specify)	

11. Do you have fixed suppliers? | Y | N |

12. If yes, how is this relationship sustained: code
Codes: 1.Given credit; 2. Kinship; 3. Given credit and kinship;
4. Mutual trust; 5. Other(specify).

13. What is the source of your capital ?

source	amount(Tk)	Remark
Own		
Partners		
Credit		
Total		

14. What are the sources and amounts of credit taken ?

source	amount (Tk.)	condition	
		interest (%)	period
Bank			
Mahajan			
Coop			
Friend/Reln			

15. What is your suggestion for the improvement of fish transportation ?

16. What is your suggestion for the improvement of fish preservation ?

17. What is your main source of information on price ? code

Informatiion source codes: 1. Contact person in higher market; 2. Radio bulletin;
3. Telephone message; 4. Traders Association; 5. Chalani.

18. Are you a member of the traders association ? | Y | N |

19. If yes, what are the benefits received by you ?

code

Benefit codes: 1. Credit; 2. Marketing information; 3. Better market management;
4. Credit & marketing information; 5. Marketing information & market management.

20. Costs incured by arotdar	Tk./month
Salary for office employees	_____
Salary for weigh man	_____
Salary for helper	_____
Rent for shed	_____
Electricity	_____
Office stationaries	_____
Market guard charge	_____
Sweeper charge	_____
Water charges	_____
Subscription to association	_____
Donations(mosque,madrasa,etc.)	_____
Expenses for bepari/chalani	_____
Taxes	_____
Telephone bill	_____

21. Commission and other benifits received:
   (a) Commission:
      (i) untied _____%
      (ii) dadan _____%
   (b) Fish _____%

22. What are the quantities and prices of fish transacted by your arot to–day ?
   (use Form: MP01)

Investigator	
Date	| | 93

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FAP 17 STUDY

Form: MS05 Information on fish collection process.
(information to be collected from fishermen/producers.)

1. Respondent's identification : code

Region	Market type	Market Sl	Resp. type	Resp. Sl.

Gear used :	
Bengali name	code

1.1 Respondent's Name _____ 1.3 Age____
1.2 Father's name _____ 1.4 Religion code

2. Are you a pond owner? Y | N

3. Where do you generally fish ? code
Fishing ground codes: 1.Main river; 2. Secondary river/khal; 3.Beel; 4. Flood plain;
5. Ditch, Pagar, etc.; 6. Own Pond; 7. Other's Pond.
3.1 Where did you fish to–day ? code

4.State costs incurred to bring fish to the market and other marketing costs:

Use Form MS 03

5. In how many markets do you sell ? (Number)

6. Have you taken credit from any fish trader for fishing activity ?

creditor	credit type	amount	condition	purpose		
				F	C	B
Faria						
Bepari						
Arotdar						
Chalani						

Credit code: 1. Dadan; 2. Agam; 3. Loan(Rin).

7. Has fish availability in your locality reduced in last 5 years ? Y | N
8. If yes, state reasons with ranking :

Reasons	Ranking
Siltation of river/khal/beel	
FCD Projects(	
Over–fishing	
Use of agro–chemicals	
Use of Illegal fishing nets	
Fish disease	
Other (Specify)	

9. State the quantities of fish sold and prices obtained to–day.
(use Form MP01)

Investigator	
Date	| |93

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FAP 17 STUDY

Form: MS 06 Information on fish market functionaries(Retailer).

	Region	Market Type	Market Sl	Resp. Type	Resp. Sl. No
1. Respondent's Identification : code					

1.1 Name of Respondent _____ 1.3.Age____

1.2 Father's name _____ 1.4 Religion [ ] code

1.5 Residence code [ ]

Res. codes: 1. Village; 2. Union; 3. Thana; 4. Dist.; 5. Outside [with ref.to market]

2. How many markets do you operate at? (number) [ ]

3. How long have you been engaged in fish trade? (yrs) [ ]

4. What is the period of your involvement in fish trade ? (code) [ ]

codes: 1. Throughout the year; 2. beel harvesting period; 3. pond harvesting period;
4. Beel and pond harvesting period;

5. If you are part–time in fish trade, what do you do during the rest of the year?

code [ ]

Secondary occupation codes: 1. Fishing; 2. Fish fry trade; 3. Fish net trade;
4. Agriculture; 5. Other.

6. What was the daily average quantity of fish traded by you during the peak and lean periods last year ?

Period	Quantity in kg. and Price in Taka / kg.													
	Major carp		Exo. carp		Snake head		Other L.Sp.		Live fish		Small fish		Hilsa	
	Qy	P	Qy	P	Qy	P	Qy	P	Qy	P	Qy	P	Qy	P
Peak														
Lean														

7. From whom do you generally buy fish?

Supply source	% of total purchase	
	peak period	lean period
Own		
Fisherman		
Faria		
Bepari		
Chalani		
Fish coop		
Arotdar		

8. Has there been any change in your business in last 5 years ? [Y] [N]

9. If yes, indicate the changes:

Indicator	% Increase	% Decrease
Volume of trade		
Income		

10.State reasons with ranking:

Reason	Ranking
Change in fish availability	
Incraesed competition	
High prices	
Change in demand	

11. Has fish availability reduced in last 5 years ? Y | N

12. If yes, state reasons with rankings:

Reasons	Ranking
Siltation of water bodies	
FCD Projects	
Over fishing	
Use of agro– chemicals	
Use of illegal fishing nets	
Fish disease	
Other (specify)	

13. What is the source of your capital ?

source	amount(Tk)	Remark
Own		
Partners		
Credit		
Total		

14. What are the sources and amounts of credit taken ?

source	amount (Tk.)	condition	
		interest%	period
Bank			
Mahajan			
Arotdar			
Bepari			
Coop			
Friend/Reln			

15. Do you realize extra weight while buying from the fisherman ? Y | N

16. If yes, state the system and extent of extra weight:_____ %

17. Are you a member of the traders association ? Y | N

18. If yes, what are the benefits received by you ? code
Benefit codes: 1. Credit; 2. Marketing information; 3. Better market management;
4. Credit & marketing information; 5. Marketing information & better market management.
6. Other.

19. What are the quantities of fish bought/sold and prices obtained by you to–day ?
(Use Form: MP01)

Investigator	
Date	93

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FAP 17 STUDY

Form : MS07

Information on ice plants/factories

Region	Market type	Market Sl	Res. type	Res. Sl.

1. Name of the enterprise _____
2. Location of the ice plant :
2.1 Place _____ 2.2 Thana _____
2.3Dist. _____

3.1 Respondent's Name _____ 3.3 Age _____
3.2 Father's Name _____ 3.4 Religion code [ ]
3.5 Designation _____

4. Basic information on ice plant :
4.1 Year of establishment _____
4.2 Total capacity (tonnes) _____

4.3 Types of ice produced daily

Season	Block		Flake	
	Qy in kg	Price/kg.	Qy in kg.	Price/kg.
Summer				
Other time				

5. Product distribution pattern :

ConsumerType	% Consumed	
	Block	Flake
Ice cream traders		
Fish traders		
Retailers		
Others		

6. Does the plant/factory operate at below normal capacity ? [Y | N]
7. If yes, please quantify _____%

8. How is ice delivered to the fish market ? code [ ]
Codes : 1. Insulated carrier; 2.Open carrier; 3. Own arrangement of the fish trader.
9. Name the fish markets which obtain ice from this plant/factory:

Market Name	Thana	Distance (km.)

Investigator	
Date	| | 93

FAP 17 STUDY

Form: MS08 Information from transport agency

Respondent's Identification : code	Region	Market type	Market Sl.	Res. Type	Res. Sl.

1. Name of the Agency _____
2. Place of information _____
2.1 Thana _____ 2.2 Dist._____

3.1 Respondent's Name _____ 3.3 Age____
3.2 Father's Name _____ 3.4 Religion code

4. Respondent's Designation _____

5. Information on Fish transportation :

Origin of shipment		Destination	Market	Distance	Cost Tk./
Market name	Thana	Name	Thana	(km)	md(40 kg)

Investigator	
Date	| | 93

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FAP 17 STUDY

Form: MP01 Information on quantities of fish traded by respondents and prices obtained.

Respondent's Name____________________ SL. No. __________

Bundle No	Bengali name of Species in bundle	Sp. Code	No./ %	Kg/piece	Bundle Wt(kg)	Bundle price (Tk)		Price / Kg	
						Buying	Selling	Buying	Selling

Investigator				
Date				93

Fish Price Monitoring-Retrospective
Date: / /

Market Code Enumerator:

Name		Rn.		Type		Sl.	

	OBSERVATION (Price in Tk/kg)																			
Lead Species	January			February			March			April			May			June				
Puti																				
Tengra																				
Bailla																				
Tilapia																				
Ranga Chanda																				
Pangas																				
Magur																				
Boal																				
Shol																				
Tara Baim																				
Gura Icha																				
Rui																				
Karfu																				
Ilisha																				
Small Shrimp																				
Large Prawn																				

Fish Price Monitoring
Date : / / **Enumerator:**

Market Code

Name		Rn.		Type		Sl.	

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Small fish (gr.1) Puti	180					
Kachki	58					
Mola	5					
Canchan puti	175					
Teri puti	181					
Darkina	75					
Tit puti	212					
Phutani puti	178					
Morarai	13					
Techoukka	9					
Debari	68					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Small fish (gr.2) Tengra	137					
Gang Tengra	81					
Gulsha Tengra	24					
Bata	100					
Baspata/Kajuli	2					
Buzuri	136					
Katari	188					
Batashi	169					
Kabashi	132					

Fish Price Monitoring
Date : / /
Market Name : **Enumerator:**

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./kg)			
			1	2	3	4
Small fish (gr.3) Bailla	83					
Kaikka	210					
Khorsula	185					
Meni/Bheda	138					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Small fish (gr.4) Tilapia	150					
Fulchela	189					
Foli	145					
Nola	-					
Nilotica	151					
Sarputi	179					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Small fish (gr.5) Ranga chanda	37					
Chapila	86					
Nama chanda	36					
Chuna	57					
Lal kailsha	56					
Colisha	55					

Fish Price Monitoring
Date : / /
Market Name : **Enumerator:**

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Other Large Species Pangus (small)	158					
Pangus (large)	158					
Chital (small)	144					
Chital (large)	144					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Live Fish Magur (small)	49					
Magur (large)	49					
Shingi (small)	88					
Shingi (large)	88					
Koi (small)	6					
Koi (large)	6					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Cat Fish Boal (small)	209					
Boal (large)	209					
Air (small)	130					
Air (large)	130					
Baghair	16					
Bacha	76					
Ghaura	51					
Rita	186					
Shillong	196					
Pabda (small)	148					
Pabda (large)	148					

Fish Price Monitoring
Date : / /
Market Name : **Enumerator:**

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Snake Head Shoal (small)	42					
Shoal (large)	42					
Gozar (small)	39					
Gozar (large)	39					
Taki	41					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Spiny Eel Tara Baim	121					
Guchi Baim	123					
Baral Baim	122					
Gutum	110					
Bilturi	139					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Gura Icha	117					

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Major Carps Rui (small)	107					
Rui (large)	107					
Catla (small)	32					
Catla (large)	32					
Mrigal (small)	47					
Mrigal (large)	47					
Kalbaus	102					
Ghainna	104					
Bhagna/Laacho	48					
Bhangan	101					

Fish Price Monitoring
Date : / /
Market Name : **Enumerator:**

Bengali Name	Code	Av. Price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Exotic Carps Karfu (small)	62					
Karfu (large)	62					
Mirror carp	65					
Gheso rui	60					
Silver carp (small)	91					
Silver carp (large)	91					

Bengali Name	Code	Av. price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Ilish (small)	89					
Ilish (large)	89					

Bengali Name	Code	Av. price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Shrimp Chotka chingri	119					
Tengua chingri	113					

Bengali Name	Code	Av. price/ Kg.	Observations (Tk./Kg)			
			1	2	3	4
Large Prawn Golda	120					


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