
Fish-market Chain and Fishers' Incomes in Sherpur District, Bangladesh

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Abstract

In Bangladesh the fish-market chain, which links fishers and retailers within the country, as well as with other countries in the subcontinent, is exclusively controlled by the private sector. Fishers are often exploited by middlemen because of their isolation and the difficulties they face due to poor roads, lack of transportation, and limited communication. Middlemen can exploit fishers because they control access to the market chain and the consumer. Therefore, significant income differentials exist in the market chain, and these differentials pose a great disadvantage to local fishers. I argue that there is a need to identify an alternative market chain that is more equitable towards local fishers. In this paper I seek to: 1) describe the existing market chain and the income status of the various actors within it; 2) examine the impact that high-value fish species have on the market chain; and 3) identify an alternative market chain, as well as perceived barriers to using this chain. Ultimately, I hope this paper will lead to an improvement in the livelihoods of fishers, and other members of the market chain.

Introduction

In Bangladesh the fish-market chain is exclusively controlled by the private sector, which links fishers and retailers within the country, as well as with other countries in the subcontinent. The fisheries sector plays an important role in respect to income, employment, consumption and also exportation. It constitutes 3.74 percent of Bangladesh's gross domestic product (GDP), 20.87 percent of the total agricultural sector, and 4.04 percent of export earnings. In addition, 12.5 million people in Bangladesh are either directly or indirectly employed in the fisheries sector. A great number of people, many of whom are living below the poverty level, find employment in the domestic fish market chain as fishers, traders, intermediaries, day laborers, and transporters (Ahmed, *et.al.* 1993). There are three levels to the market chain that can be observed in the distribution of captured fish. These are the primary, secondary, and consumer levels. Primary marketing places are at fish catching points where fishers operate, while the secondary levels involve a variety of ancillary actors, such as *paikars*, *beparies*, retailers and *arotdars* (see Box 1). These actors control the fish-market chain and are commonly known as middlemen. Arotgars procure fish with the help of local brokers (*dalals*) who receive a commission from local *paikars*.

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Arotdars sell fish to beparies; beparies sell fish to retailers; and retailers sell fish in the consumer market. Figure 1 shows the general marketing chain and linkages among traders.

Fishers are often exploited by middlemen because of their isolation and the difficulties they face due to poor roads, lack of transportation, and limited communication. Middlemen can also exploit fishers because they control access to the market chain and the consumer. However, the most serious market differentials seem to occur in remote communities that lack transport, ice, and road facilities, and where the fishers are in a particularly weak position in relation to intermediaries (Rahman 1997). Rahman *et al* (2009) argue that middlemen have established a fish-marketing chain based on extreme exploitation of fishers through intermediaries at different levels. Harvesting, processing, and marketing of fish are sources of income for over 100 million people in Bangladesh, about 80 percent of whom are considered part of low income or poverty groups (World Bank 1992). Fishers live sub-human lives and are the most deprived and poorest class (Chowdhury 1993) and past studies have made it clear that fishers' incomes are generally low (Cunningham 1994). As a result, significant income differentials exist in the market chain; these differentials pose a great disadvantage to local fishers.

Box 1: Definitions of major actors in Bangladesh's fisheries sector

Fishers : Can be independent owner/operator; an employee of a boat owner (salaried); or work on a share bases.

Paiker : Small-scale middlemen who collect fish from small markets and end them to bigger markets, or to near-by *arotdars*.

Beparies : Small-scale middleman who collect fish from fishers or local markets and export to wholesale retail markets or todistant urban wholesale markets.

Dalals : Brokers who operate at the local level to procure fish for paikers for a commission.

Arotdars : Large-scale middlemen who are permanent shopkeepers and commission agents having their own premises and staff in the markets. They are the middle functionary between beparies and retailers.

Retailers : Small-scale middleman who buy fish from arotdars or from beparies and sell directly to consumers. Retailers sell fish from permanent or non-permanent shops or stalls in retail markets.

Capture fisheries represent a huge market nationally and internationally. All actors in this market depend on captured fish for their livelihoods. However, at present the income levels of the various actors in the market chain have not been documented and little is known about the relative benefits derived by different actors. I argue that there is a need to identify an alternative market chain and examine the possibility of fishers using such a chain. Accordingly, this paper seeks to: 1) describe the existing market chain, and the income status of the various actors; 2) examine the impact that high-value fish species have on the market chain; and 3) identify an alternative market chain and perceived barriers to using this chain. Ultimately, I hope this paper will lead to an improvement in the livelihoods of fishers, and other members of the market chain.

Figure 1: Fish-market chain

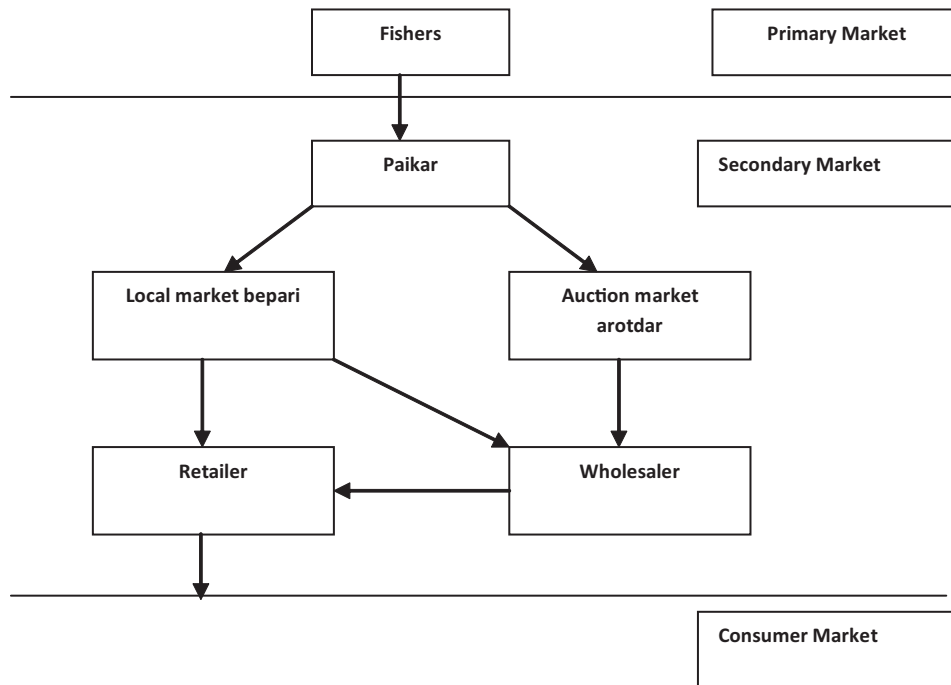
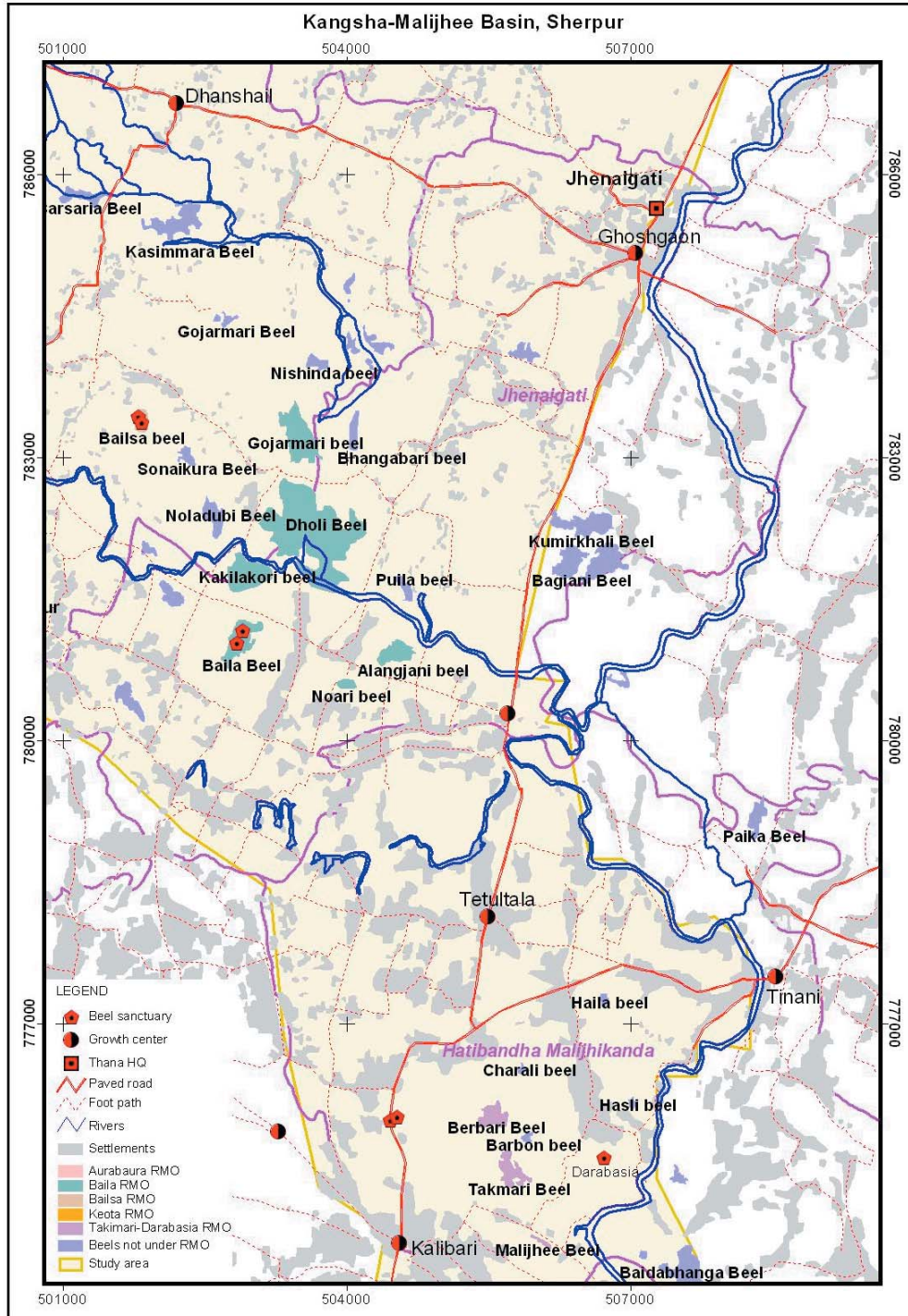


Figure 2: Map of the study area



Background

The study area is located in north-central Bangladesh in the Sherpur District. Geographically the area is a part of the Garo and Tura hills and includes the catchment area of the upper Kangsha and Malijhee watersheds. Jhenaigati Upazila is located on a large flood plain where flash floods occur regularly; the upazila is full of various bodies of water, such as *beels* (a low-lying body of water that is connected to rivers or canals and inundated during the rainy season), canals, rivers, and narrow hill streams (*jharna*) that flow from upstream rivers. Because these bodies of water lie at the lower end of the hilly Kangsha-Malijhee watersheds they are greatly affected by siltation. The upazila covers 231 square kilometers, including expanses of water. Employment opportunities in the upazila are limited, but a large number of people engage in fishing. Villagers in the upazila who reside near water are mostly fishers.

In 2000, the United States Agency for International Development (USAID) and the Government of Bangladesh initiated the Management of Aquatic Ecosystems through Community Husbandry (MACH) project. This project, which ran through 2008, sought to improve the livelihoods of fishers and local people while protecting aquatic ecosystems through activities like establishing fish sanctuaries, addressing siltation, and developing tree plantations. Today, the activities MACH initiated continue under the Integrated Protected Area Co-management (IPAC) project. As a result of these projects, indigenous fish populations have increased and other fish species have been introduced. However, the incomes of fishers, to their disappointment, have not increased significantly. Therefore, it is appropriate to study the fish-market chain and its impacts on the incomes of fishers in Jhenaigati Upazila.

Methods

For this study I carried out a market chain assessment for capture fisheries in Kangsha Malijhee and Sherpur districts, which are part of Jhenaigati Upazila. The study was conducted between August 2009 and January 2010. I began by making general observations of the study area in August 2009, and then collected detailed data between September and December 2009. I worked in three beels-Dhali, Baila, and Bailsha-where I surveyed seven villages. I also worked in the Takimari-Darabasia beel area where I surveyed another six villages. Within the upazila I surveyed five rural markets and two market towns to get an overview of the fish-market chain and its actors. I collected data from twenty fishers in two villages-Darikalinagar and Chenguria-ten paikars from the two beel areas, fifteen beparies from three rural markets (Jhenaigati, Kalibari and Tinani Bazaar), fifteen retailers from the same three rural markets, and six arotdars from Sherpur and Jamalpur district markets.

I conducted focus group discussions (FGD) with fishers, paikars, beparies, retailers, and arotdars to get an overview of the fish-market chain; in total I conducted five FGD (one in each of the villages where I interviewed fishers, and three in each of the market places where I interviewed the middlemen). Each FGD contained between ten to fifteen people (no women were included because women do not participate in the market chain in this area).

In addition, I conducted a survey using a close-ended structured questionnaire. Households and middlemen were selected by random sampling. I crosschecked responses to the questionnaire with key informants such as consumers, local elites, local leaders, public representatives, MACH staff members, IPAC project members, and government officials. Finally, I used quantitative methods to analyze income differentials between fishers and the various middlemen in the fish-market chain.

Results

Fish-market Chain and the Economic Status of Various Actors

The fish-market chain in Bangladesh, which is both traditional and complex, plays an important role in connecting fishers to consumers through a chain of middlemen. Coulter and Disney (1987) suggest that fresh fish are marketed through different chains that include primary, secondary, and final consuming markets. In this section, I will focus on these three levels of the chain. The primary markets of the study area are situated at the seven beels where fish are caught. Arotdars procure fish from fishers with the help of local dalals who receive a commission. I found that some portions of catches are sold locally by fishers and beparies, and that sometimes fishers are even able find a way to sell their catch directly to the secondary market. The secondary market is large and includes traders that operate nationally, commission agents, wholesalers, fish processors, and exporters. I found that the arotdars collect fish from their own networks, mostly from paikars at the upazila level and other parts of the country. The arotdars also buy fish directly from fishers where roads for transportation are available. Local beparies buy fish from arotdars and also from paikars. In the secondary market beparies sell fish to retailers in the local markets. At the consumer level most inland fish are consumed fresh due to strong consumer preference. I found that the beparies buy fish from the secondary markets and sell them to retailers in upazila and village level markets, and then finally to consumers. Figures 3 and 4 show two different representations of the market chain; Figure 3 shows the actors in the chain and Figure 4 shows where the transactions occur.

Figure 3: Actors in the market chain of the study area

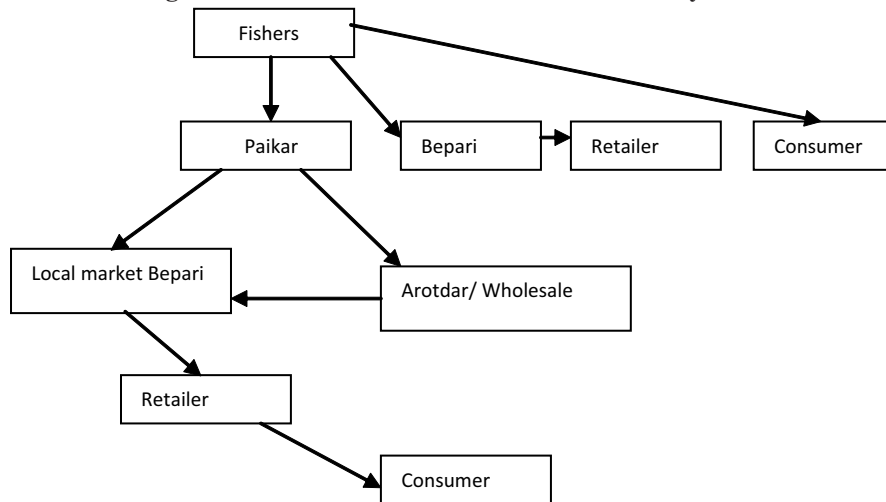
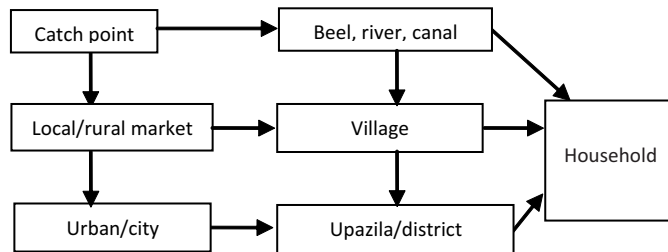


Figure 4: Transaction locations in the market chain of the study area



Differences in income in the study area are reflected in the housing used by various actors in the market chain. Four categories of houses were identified in the study area; these are summarized in Table 1. I found that fishers do not own improved houses (Housing Status Categories 3 and 4); paikars do not own any unimproved homes (Housing Status Category 1); and beparies do not own any of the most improved homes (Housing Status Category 4). As the highest beneficiaries in the fish-market chain only arotdars own improved homes (Housing Status Categories 3 and 4). Retailers belong to a marginalized stratum of the society and their housing condition is more like the fishers (Housing Status Categories 1 and 2). I found that the housing conditions of fishers are very poor and relatively the same as the retailers. The housing status of paikars and arotdars is better than that of other actors in the fish-market chain.

Table 1: Housing status of fishing-market chain actors

Category	Fishers	Paikars	Beparies	Arotdars	Retailers	Total
1. Earthen floor, straw roof, no tube well or sanitary latrine	11 (55%)	0 (0%)	1 (7%)	0 (0%)	8 (53%)	20 (30%)
2. Earthen floor, tin roof, no tubewell or sanitary latrine	9 (45%)	3 (30%)	11 (73%)	0 (0%)	7 (47%)	30 (45%)
3. Earthen floor, tin roof, tubewell and sanitary latrine	0 (0%)	6 (60%)	3 (20%)	4 (67%)	0 (0%)	13 (20%)
4. Cement floor, tin roof and tubewell and sanitary latrine	0 (0%)	1 (10%)	0 (0%)	2 (33%)	0 (0%)	3 (5%)

According to my analysis, fishers have an average household size of 7.55, paikars 5.7, beparies 5.9, arotdar 5.5, and retailers 6.73 people per household. Among members of the fish-market chain fishers have the largest families and arotdars have the smallest. I found that one factor affecting family size is level of education, which is linked to awareness of family planning procedures (Joadder 2008). Figure 5 illustrates that fisher households have the largest percentage of illiterate members and arotdars have the highest percentage of members who have completed classes VI-X. Another factor influencing family size is the belief among fishers that more children will improve their ability to increase their income.

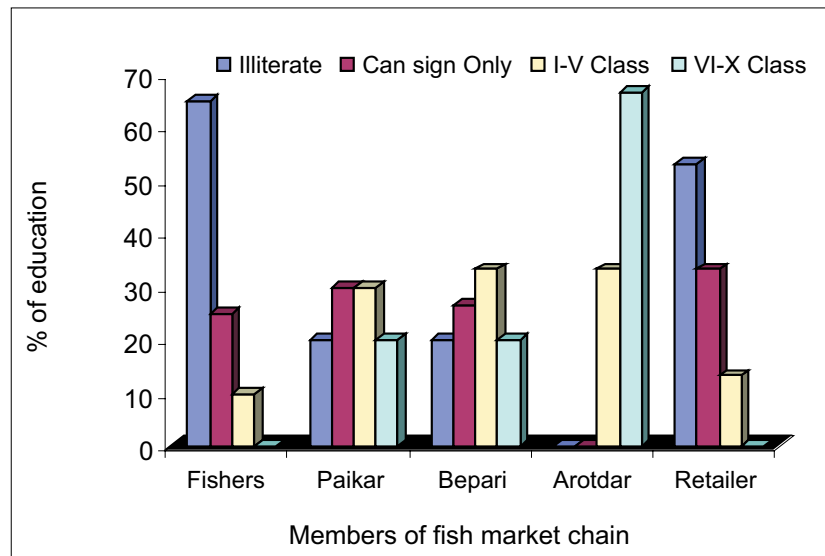


Figure 5: Education levels among actors in the fish-market chain

In part due to the reason discussed above, education is an important socioeconomic indicator. I classified members of the fish-market chain into four categories of education level: 1) illiterate; 2) can sign their name only; 3) attended classes I-V; and 4) attended classes VI-X. I found that among the twenty fishers 65 percent were totally illiterate, 25 percent can sign their names but cannot read, 10 percent had attended classes I-V, and no one had gone beyond primary school. In contrast, none of the arotdars were illiterate, 33 had attended classes I-V, and 67 percent had attended classes VI-X (Figure 4). Retailers had education levels similar to fishers; 53 percent of retailers were illiterate and 33 percent can sign their name but cannot read.

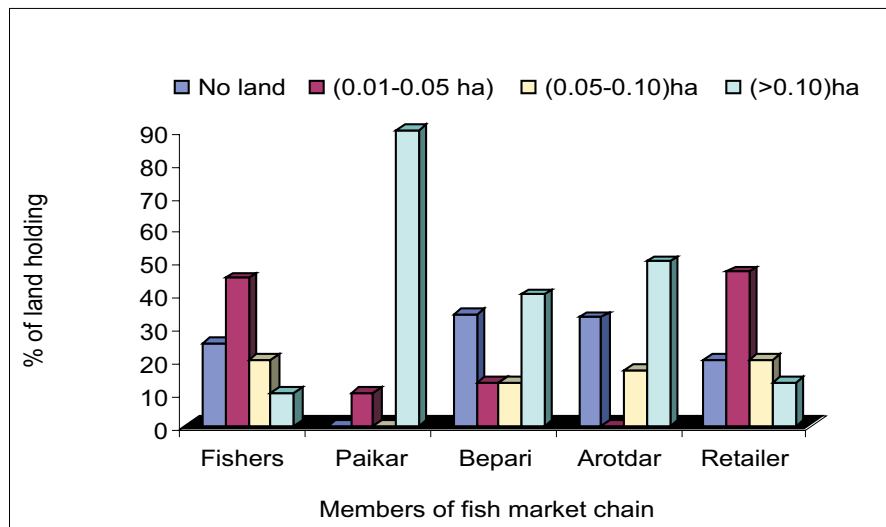


Figure 6: Landholdings among members of the fish-market chain

Figure 6 shows the land holdings of the various actors in the fish-market chain. I classified land holdings into four categories: 1) landless (0 hectares); 2) small (0.01 - 0.05 hectares); 3) medium (0.05 - 0.10 hectares); and 4) large (>0.10 hectares). I found that among the twenty fisher respondents 25 percent are landless; 45 percent are small land owners (own only their homestead); 20 percent are medium land owners (own their homestead and a small agricultural plot) and only 10 percent are large land owners. Retailers had land holdings similar to fishers. On the other hand, 90 percent of paikars and 50 percent of arotdars had more than 0.10 hectares of land. Approximately one-third of the beparis and arotdars are landless. These people live in rented homes in urban areas and rural market towns.

In the surveyed area some actors in the fish-market chain have sources of income in addition to fishing, though fishing usually remains their main source of income. Some actors earn income from day labor, working their own agricultural land, and other sources. In this study I classified annual incomes in 2009 from all sources in four categories: 1) less than 50,000 BDT (720 USD) per year, 2) 50,000 to 100,000 BDT (720 to 1,441 USD) per year; 3) 100,000 to 200,000 BDT (1,441 to 2,882 USD) per year; and 4) more than 200,000 BDT (2,882 USD) per year. Approximately 55 percent of fishers had an annual income of less than 50,000 BDT and 45 percent of the fishers had income between 50,000 and 100,000 BDT. In fact none of the fishers had an annual income that exceeded 62,000 BDT (893 USD) from all sources. I found that 100 percent of paikars had annual incomes between 100,000 BDT and 200,000 BDT; 93.3 percent of beparies had annual incomes between 50,000 BDT and 100,000 BDT; 66.7 percent of arotdars had annual incomes greater than 200,000 BDT; and 100 percent of retailers had an annual income between 50,000 and 100,000 BDT. Figure 7 illustrates that fishers had the lowest incomes in the market chain. Small investors in the market chain, such as beparies, paikars, and even retailers had highly satisfactory incomes. It is well known that arotdars are the big investors in the market chain and accordingly they receive the biggest profits.

In the survey I asked respondents to estimate their average annual income in the previous 3 years (2006 through 2008). The aim was to determine whether respondents reported any increases in income between this period and 2009. Figure 8 shows that 65 percent of fishers reported an average annual income during the years 2006-2008 below 50,000 BDT and 35 percent reported an income between 50,000 and 100,000 BDT. In comparison, all arotdars reported an income between 100,000 and 200,000 BDT. A comparison of Figures 7 and 8 shows that in 2009, 10 percent more fishermen reported an income of 50,000 to 100,000 BDT than reported this level of income for the years 2006-2008; 50 percent of the paikars reported an increase in their income; 67 percent of the arotdars reported an increase in their income to more than 200,000 BDT. When comparing average annual income in the 2006-2008 periods with annual income in 2009, the incomes of paikars and arotdars grew more than the incomes of the other actors. This suggests that the fish-market chain benefits paikars and arotdars more than other members of the chain; fishers, in particular, are the most deprived. Indeed it has been suggested that it is essential to lessen the role of middlemen in order to increase the incomes for the fishers (Katiha and Chandra 1990).

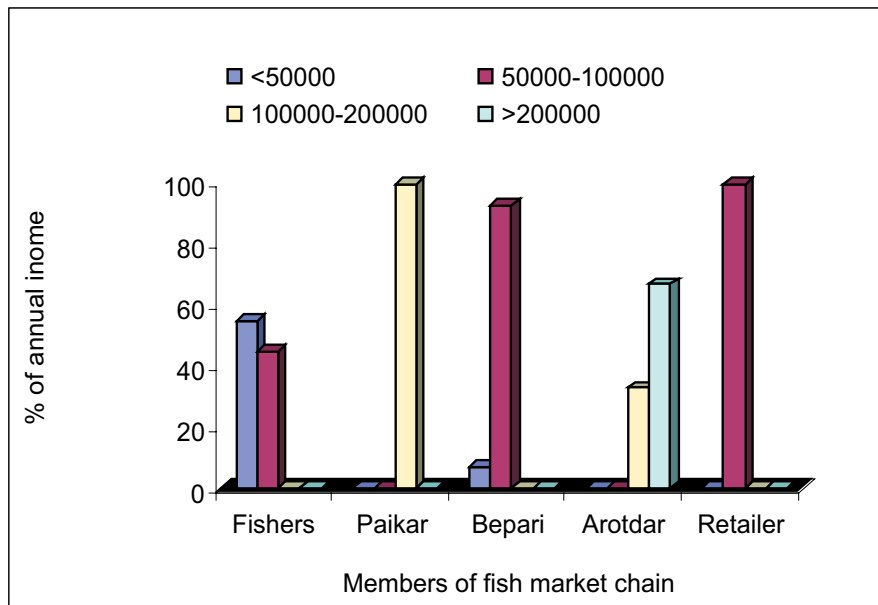


Figure 7: Annual income of members of the fish-market chain in 2009 (from recall)

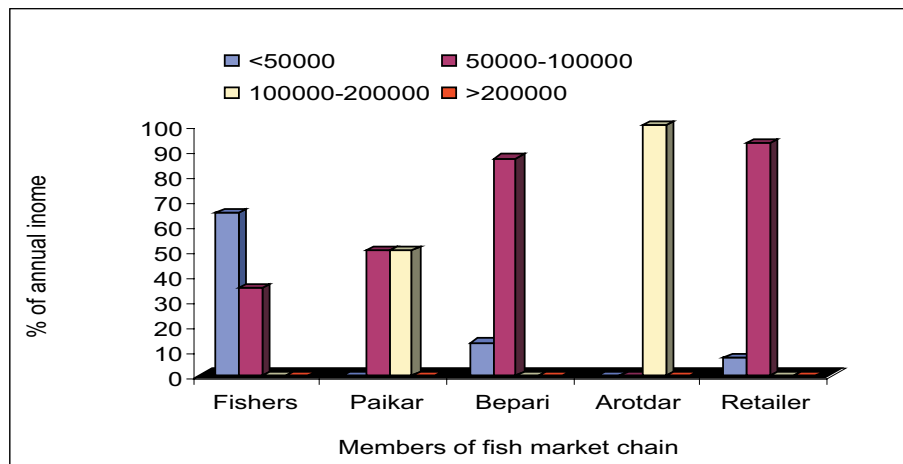


Figure 8: Average total annual income of members of the fish-market chain between 2006 and 2008 (from recall).

To further clarify the economic status of members of the fish-market chain I also investigated studied major food items consumed. Here I consider four key food items: 1) fish, 2) meat, 3) lentils (*dal*), and 4) milk. I define food consumption as the average number of days a particular food was consumed in a month. I found that fishers consume fish only 12.5 days per month and retailers 12.93 days per month. In comparison arotdars consume fish 25.5 days per month. In all 4 food categories fishers and retailers consume less of each item than other members of the chain. Arotdars followed by paikars consumed the most of each item and beparies were in between. Discrepancies in consumption are depicted in Figure 9.

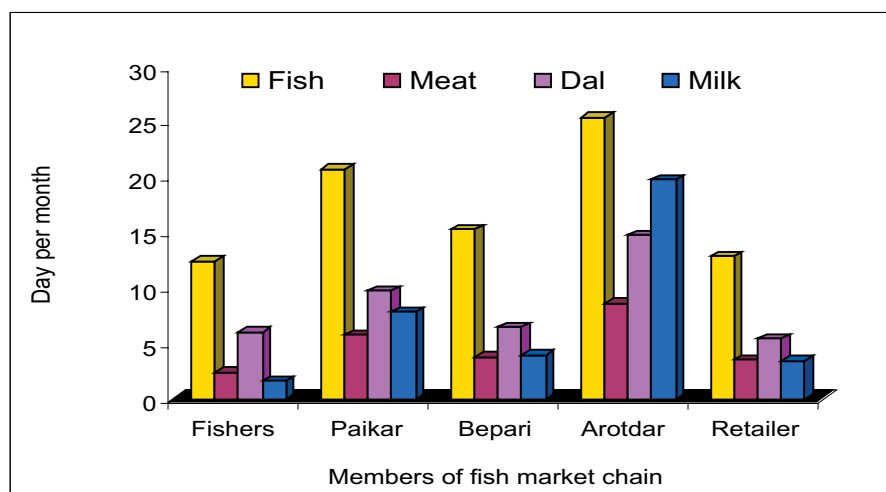


Figure 9: Food consumption among members of the fish-market chain (average number of days per month each food is consumed).

Impact of High-value Fish Species on the Market Chain

Every fish species has market value, but prices vary according to species. Low value fish have short market chains (from fisher to nearby consumers), while higher value fish have longer market chains as they make their way to wealthier consumers in urban areas. I observed that some high value fish species, e.g. modhu pabda (*Ompak pabda*), tengra gulio (*Mystus cavasius*), ruhu (*Labeo rohita*), bowal (*Wallago attu*), tengra (*Batasio tengara*), batashi (*Pseudeutroptus atherinoides*), baim (*Mastacambelus armatus*), tara baim (*Macrornathus sculeatus*), kal baosh (*Labeo calbasu*), go through longer market chains. These fish are highly valued for their taste, high protein content, and ability to maintain freshness for a long period of time; they are well received by most consumers. These fish species have a longer market chain with many intermediary steps and many actors involved in their processing. As a result of this longer market chain, the marketing of high value fish employs more people than that of low value fish. The longer market chain which employs more people also means that the end price is higher. As a result, even though the cost to consumers is higher, fishers receive less benefit from high value fish than do the numerous middlemen. High valued fish impact the market chain by providing more employment opportunities, but the chief beneficiaries from these fish are powerful intermediaries.

Alternative Market Chain and Perceived Barriers

I did not find that any alternative market chains existed in the study area; fishers have no choice but to sell their catch through traditional markets. I observed that fishers catch fish from beels, khals, and rivers near their homes. I also observed that the fishers tended to sell their fish to paikars near fishing sites because their small catches did not make it profitable to transport them to market. However, by selling to nearby paikars they received lower prices. For their part, paikars sometimes form syndicates to group their fish into larger catches in order to fetch higher prices. So, the lack of alternative market chains influences the income of the paikars as well.

Conclusion

According to my findings, fishers lack bargaining power, which allows middlemen to control the fish-market chain. Fishers are the poorest actors, with the lowest annual incomes in the fish-market chain. The main constraints they face are a lack of bargaining power and access to market information. Arotdars and paikars have the highest incomes and economic status and hence benefit the most from the existing market chain. Beparies hold an intermediate position, while retailers are only slightly better off than fishers. Fishers have not been able to maintain, let alone improve, their comparative economic status over the years.

A central problem is that the existing fish-market chain is fully controlled by the private sector and government supervision is poor. I found that most bodies of water were owned by members of the local elite, politicians, and other non-fishers. Fishers are not able to lease any of the open bodies of water and open access fisheries no longer exist. Fishers' abilities to access water resources are thus limited, giving them few opportunities to catch fish for enhancing their incomes.

Fishers' incomes are not only limited by their position in the market chain but also by the fact that fish resources are declining. As a result their daily catches have decreased in size. The small size of their catch, the distance to market, and the lack of facilities for preserving fish forces fishers to sell their catches to nearby paikars at lower prices than they would fetch at a market. Moreover, fishers are often illiterate, lack training in other occupations, and have few alternative income sources. They do not know about primary methods for preserving fish, and have little market information. Intermediaries in the fish-market chain are very powerful and they have established a market chain that exploits fishers. Fishers cannot go directly to secondary markets to sell their catch due to the constraints described and the existing market-chain system.

Recommendations

In Bangladesh the fish-market chain is totally controlled by the private sector and the government has little ability to manage it. Government agents have not taken any steps to establish a market chain that would benefit low-income fishers. In the present market chain, fishers are extremely exploited and their annual incomes are declining. I would like to make a number of specific suggestions to the government for developing and improving the existing marketing chain in order to increase benefits to fishers. These are: 1) establish community managed bodies of water where only fishers are allowed to catch fish; 2) release more fish in open waters every year; 3) improve site specific transportation and preservation facilities; 4) supply non-destructive fishing equipment; 5) reduce the number of market chain steps; 6) support free education up to the Secondary School Certificate (SSC) level and skill development training for alternative income generation; 7) provide fishers with access to bank loans to invest in small businesses during the off season; 8) develop fisher co-operative societies; 9) build roads that connect main bodies of water; 10) provide adequate knowledge on family planning; and 11) develop public-private relationships to improve the existing market chain.

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