STUDY ON LIVELIHOOD STATUS OF FISH FARMER, ARATDAR, AND FISH RETAILER OF TRISHAL UPAZILA, MYMENSINGH

A THESIS

BY

RONY KUMAR PAL
EXAMINATION ROLL NO. 09 Fish Aqua. JD-27 M
SEMESTER: JANUARY - JUNE, 2011
REGISTRATION NO. 36011
SESSION: 2009-2010

MASTER OF SCIENCE

IN

AQUACULTURE

DEPARTMENT OF AQUACULTURE
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Submitted to the Department of Aquaculture
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ABSTRACT

A study was conducted for a period of 16 weeks from July to October, 2010 in Trishal Upazila in Mymensingh district to assess livelihood conditions of fish farmer, aratdar and fish retailers. In this study, total 75 respondents (25 aratdars, 25 fishermen and 25 fish retailers) were randomly selected from the study area. Livelihood conditions of fish farmers, aratdar and fish retailers was elucidated in terms of religious status, age structure, educational status, health facilities, drinking water facilities, housing condition, sanitary facilities and annual income. Livelihood conditions of the fishing communities were not satisfactory. The fishermen were deprived of many amenities. The percentage of aratdar, fish farmer and fish retailer in case of age structure, of middle age group was found to be 52%, 48% and 24% respectively. Muslims were found as absolute majority in fish trading activities comprising 68%, 80% and 76% of aratdar, fish farmer and fish retailer, respectively. About 40% of aratdar and 52% of fish farmer had medium family size ranging 5 to 8 members whereas majority (72%) of the fish retailer had small family. Aratdar and fish retailer mostly depended on their fishing business having the small (< 0.5 ha) land area. Only fish farmers had large (> 1 ha) land area was 64%. In case of housing condition the majority (80%) of fish retailer had kacha house while 64% of fish farmer had semi-pacca house and 48% of aratdar had pacca house. On the other hand, 56% of aratdar and 64% of fish farmer had pacca and semi-pacca latrine respectively. The highest (80%) percentage of aratdar and 48% of fish farmer enjoyed health advice from Upazila Health Complex whereas only 36% of fish retailer were able to take health facilities from Upazila Health Complex. In fish marketing system, a number of middlemen were involved in Trishal Upazila. The market chain from farmers to consumers passes through a number of intermediaries e.g. local fish retailers, agents, whole salers and retailers.

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The Author

CONTENTS

Chapter-I

INTRODUCTION

Fish production and fish marketing is the main occupation of people in Trishal Upazila under Mymensingh district. Now a days, most of the farmers who engaged in agricultural production like paddy, jute, vegetables etc. are converted to fish production. Trishal Upazila is the pioneer in fish production among greater Mymensingh district. Livelihoods of fish farmer and fish marketing infrastructure are well developed in this region. So it is necessary to exposs the social status, problem and existing marketing system for improvement of aqua business in the other part of Bangladesh.

In Mymensingh, fish marketing is almost exclusively a preserve of the private sector where the livelihoods of a large number of people are associated with fish production and fish marketing systems. However the most serious marketing difficulties seem to occur in remote communities, with lack of transport, ice, poor road facilities and where the farmers are in a particularly weak position in relation to intermediaries.

A periodical gathering of people for buying and selling of fish or fisheries products is called a market. According to Chaston (1987), a fisherman in a small rural community who lands a catch in excess of his needs and seeks to exchange the fish for another product is implicitly involved in the activity of fish marketing. Markets have become a major issue for aquaculture sector, where consumers demands, international competitiveness, health and quality product are important (Muir *et al., 1996*).

Aratdars given their central position in the wholesale markets, aratdars play a leading role in the fish marketing system of Bangladesh. They can play several brokerage functions at the same time. This includes commission agent whereby they obtain a percentage fee of the auctioning price (i.e. normally 3-6%, in the case of fresh fish marketing), or wholesaler whereby they become the buyer and seller of the commodity. In some instances, part of the commission fee is also seen as an interest on dadan which they advanced to intermediary traders (i.e. paikers).

Fish farmer may be defined as people who engaged in fish farming activities to produce fish either by expensive or semi-intensive or intensive culture system. It may be full time or partial occupation along with other agricultural practices.

Fish retailer are those people who are collected or bought fish from either fish farmer or wholesaler and sell to the consumer in local market.

Domestic markets and distribution of fish are dominated by a large number of intermediaries. All fish traded internally and for export pass through private channels. Fish distribution usually involves four levels:

Primary market is defined as the place where the fisherman sells the catch to a mobile assembler, who may be known as a mahajan, a jogandar or a faria. The assembler uses a collector boat or a truck to collect the fish. When buying fish in rivers or other water areas, he may buy through local agents (dalal) who typically earns 1 to 5% commission for his services.

In secondary market the assembler sells the fish in a wholesale market to a local retailer (nickaries), local wholesaler (paiker), or distributor who transport the fish to other districts (bepari or chalani). The sale is normally carried out through the medium of a commission agent (aratdar) who conducts public auctions. In some markets fish is weighed during auctioning but more often it is not.

At the higher secondary market fish are sold to local retailers (nickaries) and wholesalers (paikers) through local aratdars who render similar services to the first level aratdars referred above.

Consuming market is that kind of market in which local wholesalers (paikers) sell to retailers (nicakries) of outlaying upazilla markets and of village markets hats, through whom the fish finally reach consumers after procuring fish at the higher secondary markets.

Communications between the traders in different markets take place with mobile telephone, which keeps wholesale prices in line throughout the country. The least informed party is the fishermen, because of his physical isolation from the markets.

Other factors, which weaken the fisherman's bargaining position, are their dependency on credit and illiteracy (Kleih *et al*., 2001).

High rate of population growth resulted in growing gap between supply and demand of fish and fisheries product of Bangladesh. Government of Bangladesh as well as many local and international NGOs are working in fisheries sector of Bangladesh, have taken many steps and programmes to increase fish production. However, very few steps have been taken by any organization either GOs or NGOs to improve the fish marketing system, which is a major part of fisheries sector. During the fishing seasons, a huge quantity of fish is not marketed due to inadequate transport facilities.

In Bangladesh, fish marketing is almost exclusively a preserve sector where the livelihoods of a large number of people are associated with fish production and marketing systems. However the most serious marketing difficulties seem to occur in remote communities, with lack of transport, ice, and poor road facilities and where the farmers are in particularly weak position in relation to intermediaries (DFID, 1997).

Livelihood status of the people involved in fish related activities depend on the fisheries resources and marketing system. So, fishing group is an important community to enrich economics of Bangladesh. But most of the fishermen and fish traders are poor and are deprived of many amenities of life. All time they have to struggle to survive. Livelihood condition of fishermen is not satisfactory at all. Most of the markets are now being controlled and managed by a few rich and influential persons as well as middle men of the area.

There is a great dearth of facilities for proper storage and preservation on a large scale. In addition, the middlemen have established a marketing chain based on the extreme exploitation of the fish farming communities by setting up an artificial pricing policy through intermediaries at different levels (Thompson, 1993). As a result farmers are not getting real price due to poor knowledge on pricing policy. In the context above, the current study was designed to address the following objectives:

1. To know the socio-economic status of aratdars, fish farmers and fish retailers;
2. To identify the problems faced by aratdars, fish farmers and fish retailers;
3. To know the existing fish marketing system.
4. To compare livelihood status of aratdars, fish farmers and fish retailers.

Chapter-II

REVIEW OF LITERATURE

The following relevant literatures were reviewed to accomplish the present study.

1. Socio-economic Condition of the Fishermen

Hossain (2008) stated that most of the respondents (members of coastal communities) were illiterate (60%) and only 14% and 16% had passed primary and secondary level of education respectively. The annual family income of a respondent was measured by his income from fishing, agriculture, business and salt cultivation etc during a year.

Rahman (2008) studied the socio-economic status of fishermen of Jamuna river. Among the fishermen, muslims and hindus were 92.5% and 7.5% respectively. It was found that age group of 30-40 years was the highest (67.5%) and age group less than 30 years was the lowest (17.5%). The average family size was 5.68 persons. Among the fishermen, 52.5% illiterate, 22.5% semiliterate (capable of writing their name), 15% educated up to primary level, 7.5% educated up to secondary level and 2.5% educated up to S.S.C. level were recorded.

Hossain (2007) studied on socio-economic conditions of haor fishermen. The largest family size (7.26) was found in the seine net fishermen group and lowest family size (5.00) was found in the push net fishermen group. Regarding the educational level, 66.67% of the haor fishermen were illiterate, 30% of them had primary and 3.33% of them had secondary level of education. The highest monthly average income was found in the seine net fishermen group and the lowest monthly average income was found in the push net fishermen group.

Kundu (2007) studied the socio-economic conditions of the prawn farmers in Khulna district. He found that 40% of the prawn farmers belonged to 41-50 years age group, followed by 29% in 31-40 years and 19% below 30 years category. About 10% of the farmers were illiterate, 53% and 25% had primary and secondary level of education, while 2% of them were bachelor degree holders. About 41%, 52% and 6% of the surveyed farmers had katcha, semi pakka and pakka houses respectively. The average family size of the respondents was estimated at 5.95.

Robbani (2007) described that housing condition of fishermen were 76.67% kacha, were half building (semi pacca) and 8.33% were pacca. The study also showed that 45% of fishermen were dependent on village doctor, while 11.67% and 3.33% got health service from upazila health complex and MBBS doctors respectively. Regarding sanitary facilities only 6.67% of fishermen had pacca toilet.

Alam (2006) conducted an experiment on the socio-economic conditions of fish farmers in some selected areas of Mithapuqur Upazila in Rangpur district. He found the average pond size was 0.15 ha, about 32% were seasonal and remained 68% were perennial. The survey revealed that 80% farmers had single ownership and 20% had multiple ownership of their ponds. The stocking density was found 17,262 fry /ha/year and annual yield was 2,609 kg/ ha/year. The average production cost was Tk.65,236kg/ha/year. The net profit was Tk 52,596 kg/ha/year and cost benefit ratio was 1.81.

Faroque (2006) conducted a study on socio-economic status of fishers in Borobela beel. Among the fishers the percentage of Muslims, Hindus and others were 80%, 12.5% and 7.5% respectively. The average number of family members of the fishermen was 6.3. The fishermen's housing condition, health and sanitary condition were very poor. Most of the fishermen's (82.5%) house and toilets (67.5%) were mud made.

Islam (2005) conducted a survey on socio-economic status of fish farmers in some selected areas of Dinajpur district and found that the average pond size was 0.16 ha (40 decimals) with range from 0.40 ha (11 decimals) to 0.81 ha (200 decimals). In the study 60% of ponds were seasonal and 64% were perennial; 76% of farmers had single ownership and 24% had multiples ownership. He found that the period of fry stocking was from March to May and average stocking density was found to be 17,370 fry/ ha/year. The average use of organic fertilizer (mainly cow dung), urea and TSP was 3,242 kg/ha/year, 294 kg/ ha/year and 124 kg/ ha/year respectively. The average annual yield of fish was found to be 2,609 kg/ ha/ year in the study area.

Rokanuzzaman (2004) reported that majority (42.3%) of the fishermen were the young aged category, while 36.6% and 21.1% belonged to middle aged and old aged categories respectively. On the basis of their family size, the respondents were classified into three categories, namely small family (2-4 members), medium family (5-6 members) and large family (>6 members).

Mahbubur (2001) conducted a study on the socio-economic conditions of the haor fishermen in Itna, Kishoregonj. The largest family size (7.57 persons) belonged to the big cast net fishermen group and lowest family size (5.06 persons) was found among the gill net group. Regarding the education level, 68% of haor fishermen were illiterate, 28% were up to primary level and 4% had only secondary level of education. The monthly average income was highest in the seine net fishing and lowest in case of push net.

Hossain (2001) reported regarding the education level of fishermen that 65% riverine fishermen were illiterate, 30% were up to primary level and 5% had only secondary level.

Shahjahan *et.al.* (2000) studied on the socio-economic condition of fishermen of the Jamuna river. He presented the socio-economic condition of riverine fishermen in terms of religion, family size and composition, education status and income. He found that the Muslims were featuring as the absolute majority (66.67%) and the Hindus were remarkably lower (33.37%). The largest family size (7, 87 persons) belonged to the ber jal fisherman and the lowest family size (5.25 persons) was found among the current jal. Regarding the educational level 66.33% of riverine fishermen were illiterate, 31.67% were educated up to primary level and only 5.0% up to secondary level. In general, majority of the fishermen were illiterate.

Quddus *et al*. (2000) found that educational levels of pond farmers in Dhaka was bellow SSC 43%, below bachelor 38% and bachelor and above were 19% respectively, but there was no illiterate fish farmer.

Roy and Dorairaj (1998) conducted a socio-economic survey on the fishermen community in 10 localities of fisherman in South Andaman, 4 localities in Middle and 3 localities in North Andaman. The average family size ranged between 4 and 6 in all localities. In South Andaman the literacy rate varied from 19.85 to 66.07% with an average of 45.3%. Almost literate on an average 61.91% have studied up to primary standard. In Middle Andaman literacy male in RRO Camp Ranga and Rangat Bay were 28.92 and 27.81%, respectively.

Bhaumik and Saha (1994) carried out a study to area the socio-economic conditions of the fishermen engaged in fishing in some estuaries of Sundarbans. The age group of the sampled fishermen varied between 20 years and 70 years. Most of them belonged to

scheduled caste community; 36.6% had have 21-30 years of experience in fishing. About 24.0% of them undertook fishing operation for 241-260 days and 39.6% spend 12 hours per day for fishing. On an average 29.0% of them caught 131-150kg fish per month.

Mollah *et al.* (1990) conducted a study on fish production of ponds in Luxmipur of Bangladesh. They found that the average size of fish farmer family was 7.61 persons, among them 3.95 and 3.61 were male and female, respectively. They revealed that 8.8% pond owners were illiterate and had no formal education. Again, 35% and 16.3% of pond fish farmers had primary and secondary level of education, respectively. About 24% of pond fish producers had higher secondary level of education and only 6.3% pond fish farmers having graduation degree and above.

2. Problems Faced by Aratdar, Fishermen and Fish Retailers

Hossain *et al.* (1992) observed that the largest problems faced by fish farmers is multiple ownership followed by lack of fund, lack of scientific knowledge, unavailability of desired fingerlings, theft, incidence of flooding, insufficient water in the pond during dry season, attack of birds, less profitable and poor fish growth.

Khan *et al.* (1991) identified that the lack of knowledge about fish culture was one of the most important problems. Among others multiple ownership, lack of guidance and supervision were the main constraints to pond fish culture.

3. Fish Marketing and its Problem

According to Kleih *et al*. (2001) the fish market structure varies from area, but in general terms can be summarized as follows:

The primary market:

In this market the fisherman sells the catch to a mobile assembler, who may be known as a mahajan, a jogandar or a faria. The assembler uses a collector boat or a truck to collect the fish. When buying fish in rivers or other water areas, he may buy through local agents (dalal) who typically earns 1 to 5% commission for his services.

The secondary market:

The assembler sells the fish in a wholesale market to a local retailer (nickaries), local wholesaler (paiker), or distributor who transport the fish to other districts (bepari or chalani). The sale is normally carried out through the medium of a commission agent

(aratdar) who conducts public auctions. In some markets fish is weighed during auctioning but more often it is not.

The higher secondary market:

Fish consumed at a distance from the secondary market is transported by the distributors (bcpari or chalani) to other distribution markets, usually wholesale markets in district towns. Here they sell to local retailers (nickaries) and wholesalers (paikers) through local aratdars who render similar services to the first level aratdars referred above.

Consuming market:

After procuring fish at the higher secondary markets, local wholesalers (paikers) sell to retailers (nicakries) of outlaying upazilla markets and of village markets hats), through whom the fish finally reach consumers.

Ahmed and Hossain (2000) noted that farmers directly sell their prawns to the local markets during November-January in Bagerhat district. The prawn supply chain from farmers to the international markets always passes through a number of middlemen field workers, prawn trades, agents and processing companies.

According to Lofvall (1999), the middlemen usually buy the fish directly from the farmers for fishermen but do not seem to have formal agreements with particular producers. Traders complaining that earlier the markets had been a buyers' market, but farmers now had become tougher in negotiating prices and played traders out against each other. Practically all wholesalers also operate as retailers and have shops in Kathmandu, Nepal. Sales per trader amounts to some 200-300 kg/day and their respective market shares appear equal. Fish from Nepalese production areas seldom travel by tracks but is more commonly sent by night bus.

Ahmad (1997) examined existing fish marketing practices, channels of distribution, price pattern and marketing margin of three beels of western Bangladesh. The author proposed that intensification of marketing activities should fish handling, training of fish market operators, fish quality control etc.

Rahman (1997) noted that in Bangladesh about 97% of the production is marketed internally for domestic consumption while the remaining 3% is exported. For proper marketing systems, marketing organizations, fish freezing and storage facilities as well as ice plants should be improved. In addition, he suggested fish quality control, role of

cooperatives, credit availability and participation of women in fish marketing should be ensured.

Haidar (1995) found that low product price, lack of water during dry season and lack of marketing facilities were dominant problems for fish farmers.

Chapter-III

MATERIALS AND METHODS

3.1 Selection and description of the study site

Trishal upazila of Mymensingh district was selected for the present study. The primary criterion for the selection of the study area was a suitable geographical coverage for good numbers of dependent aratdar, fish retailer and fishermen as far as possible. At first, primary information was collected from Trishal upazila Fisheries Officer regarding concentration of fishing activities in the study area. On the basis of this preliminary survey the final decision was taken for the study of this locality.

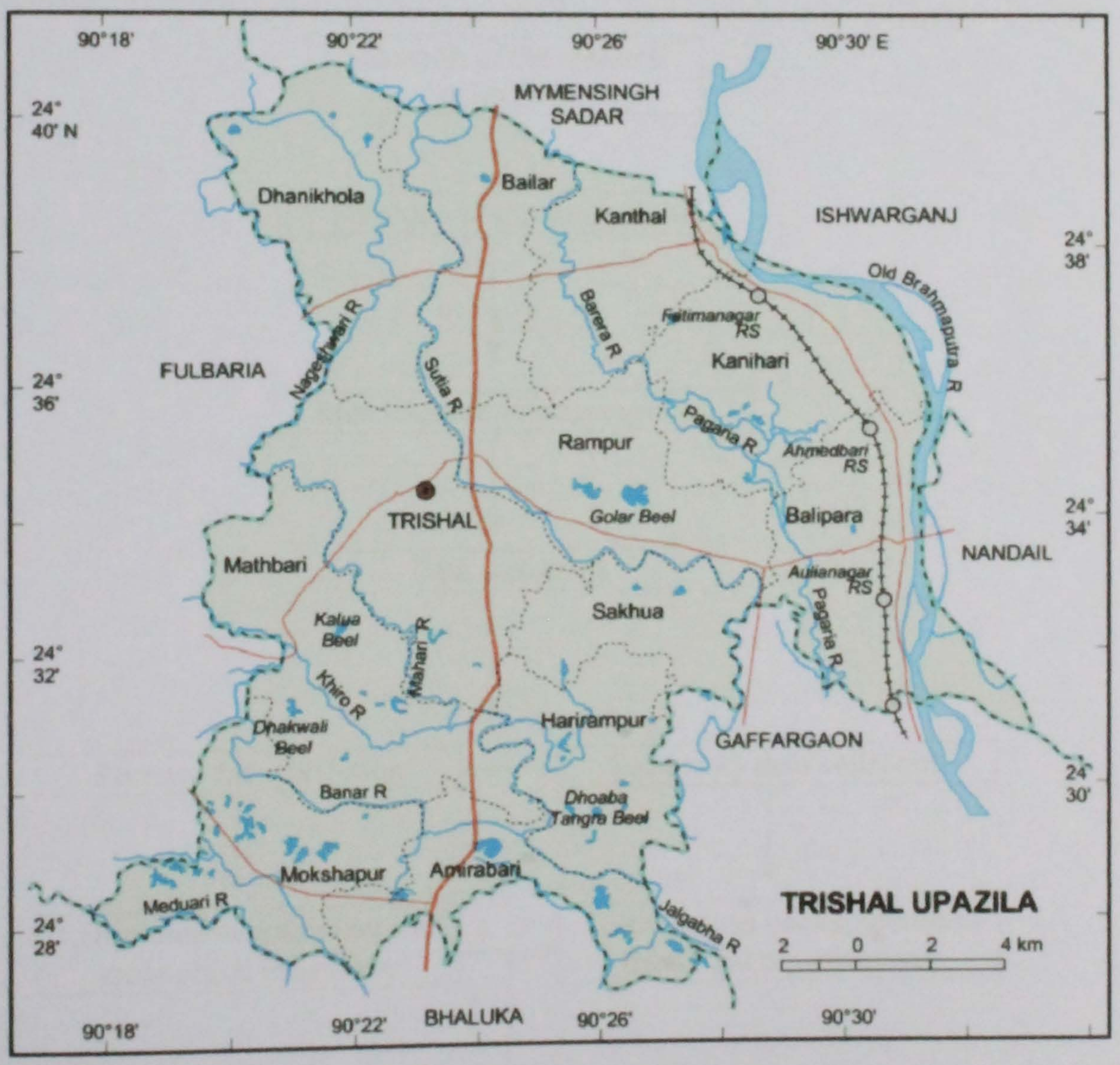

Fig . A map of Trishal Upazila showing the study area

3.2 Selection and category of fishermen as sample

In this study, total 75 respondents (25 aratdars, 25 fish retailers and 25 fishermen) were randomly selected from the study area.

3.3 Period of the study

Data were collected by the researcher himself through personal interview of the fishermen, aratdars and retailers. The study was conducted for a period of 16 weeks from July to October, 2010. The samples and data were collected weekly throughout the study period.

3.4 Flow chart of methodology

The present study has been undertaken and completed according to the following order of methodology (Fig. 1):

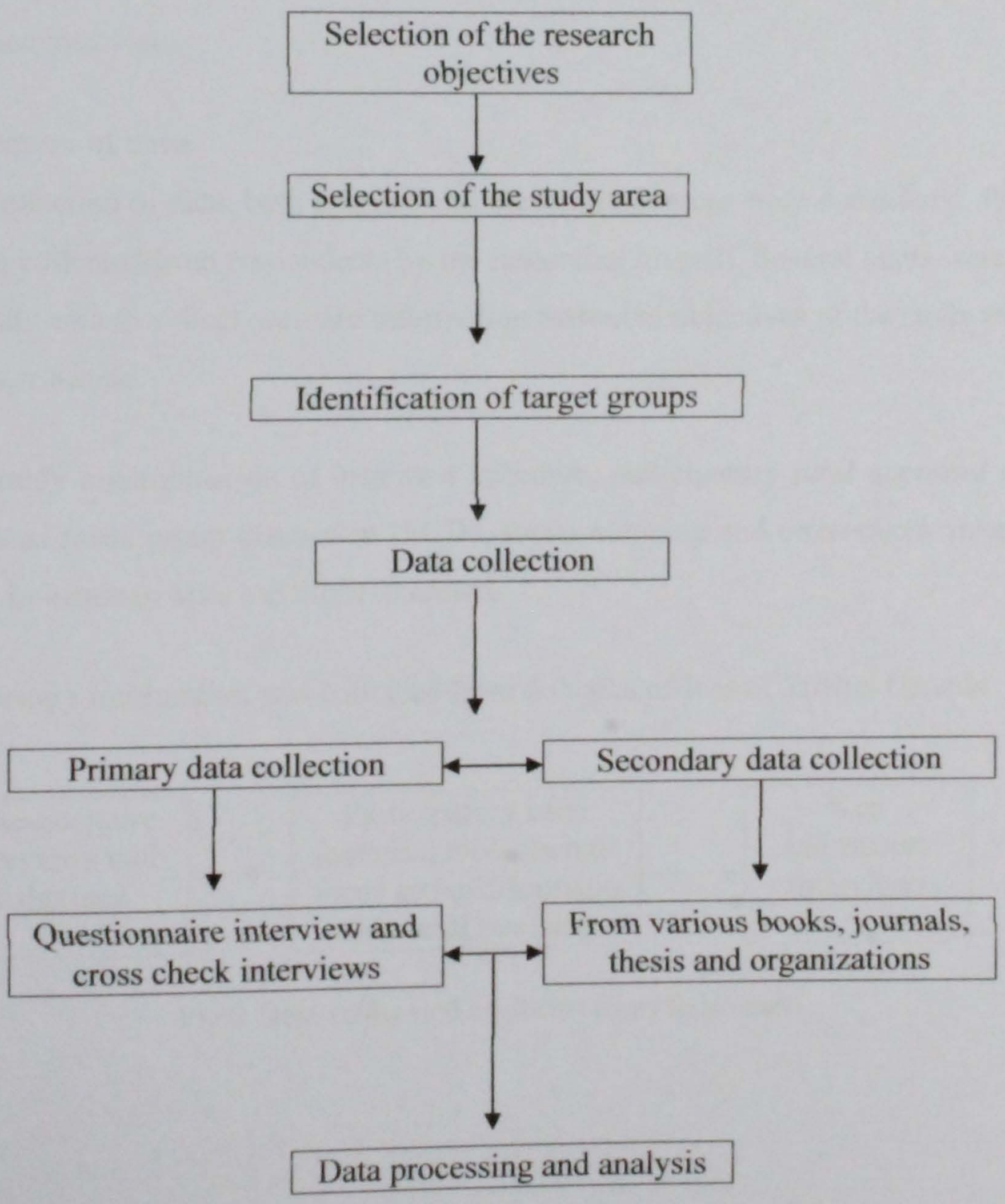

Fig.1 Design of the research methodology

3.5 Preparation of interview schedule

Interview schedule is very important for collecting data by survey method. In order to get a complete picture of livelihood of aratdar, fish retailer and fishermen to fulfill the objectives of the study a draft interview schedule was prepared. The draft interview schedule was used for pre-testing a few sample respondents by the researcher. In pre-testing, attention was paid to incorporate any new information, which was not designed to be asked and filled in the draft interview schedule. The interview schedule was then modified, changed and rearranged according to the experience gathered from the pre-test. The final schedule was developed in logical sequence so that the fishermen could answer chronologically. The schedule included various questions related to socio-demographic condition, income of fishermen and the family member and constraints faced by them. The entire questionnaire was constructed in English and then translated to Bengali during face to face interview.

3.6 Collection of data

During collection of data, both primary and secondary sources were considered. Primary data were collected from respondents by the researcher himself. Several visits were made to the study area to collect accurate information related to objectives of the study through interview schedule.

For the study a combination of interview schedule, participatory rural appraisal (PRA) tool such as focus group discussion (FGD), social mapping and cross-check interviews with key informants were used for fishermen.

The secondary information was collected from fisheries offices of Trishal Upazila.

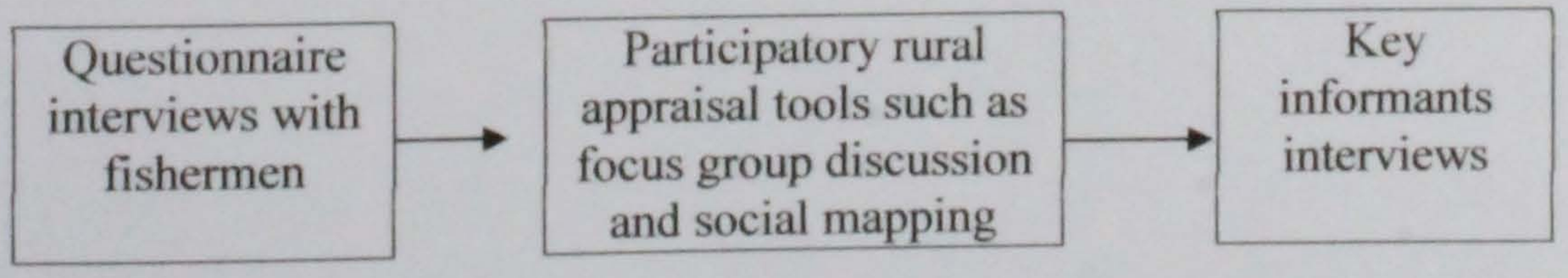

Fig.2 Data collection methods from fishermen

3.7 Method of socio-economic data collection of fishers

Socio-economic data of fishermen were collected once per week during the study period from the same 3 groups of respondents. The data were collected through questionnaire interview with the relevant respondents. The questionnaire included various questions related to socio-demographic condition and other relevant aspects of socioeconomics of aratdar, fish retailer and fishermen.

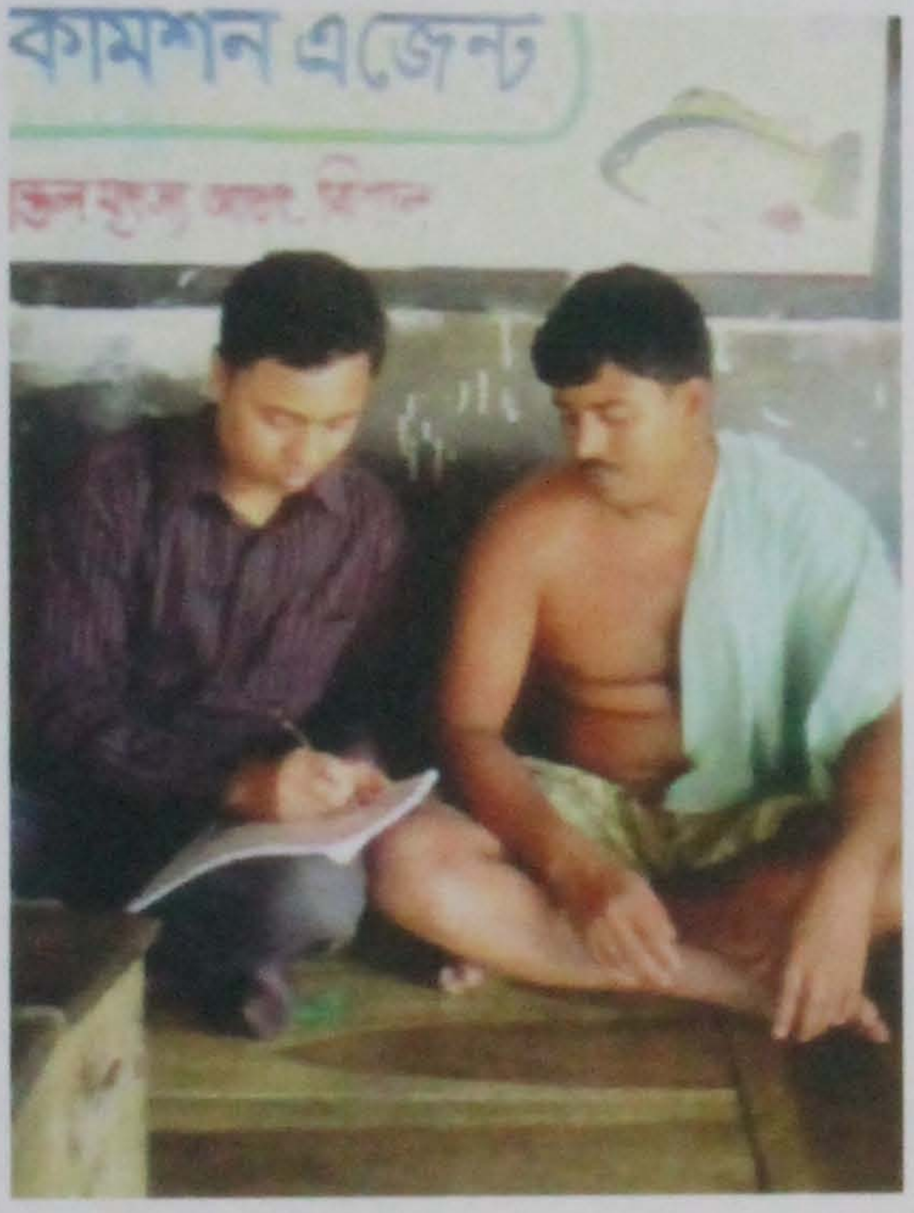

Plate: 1

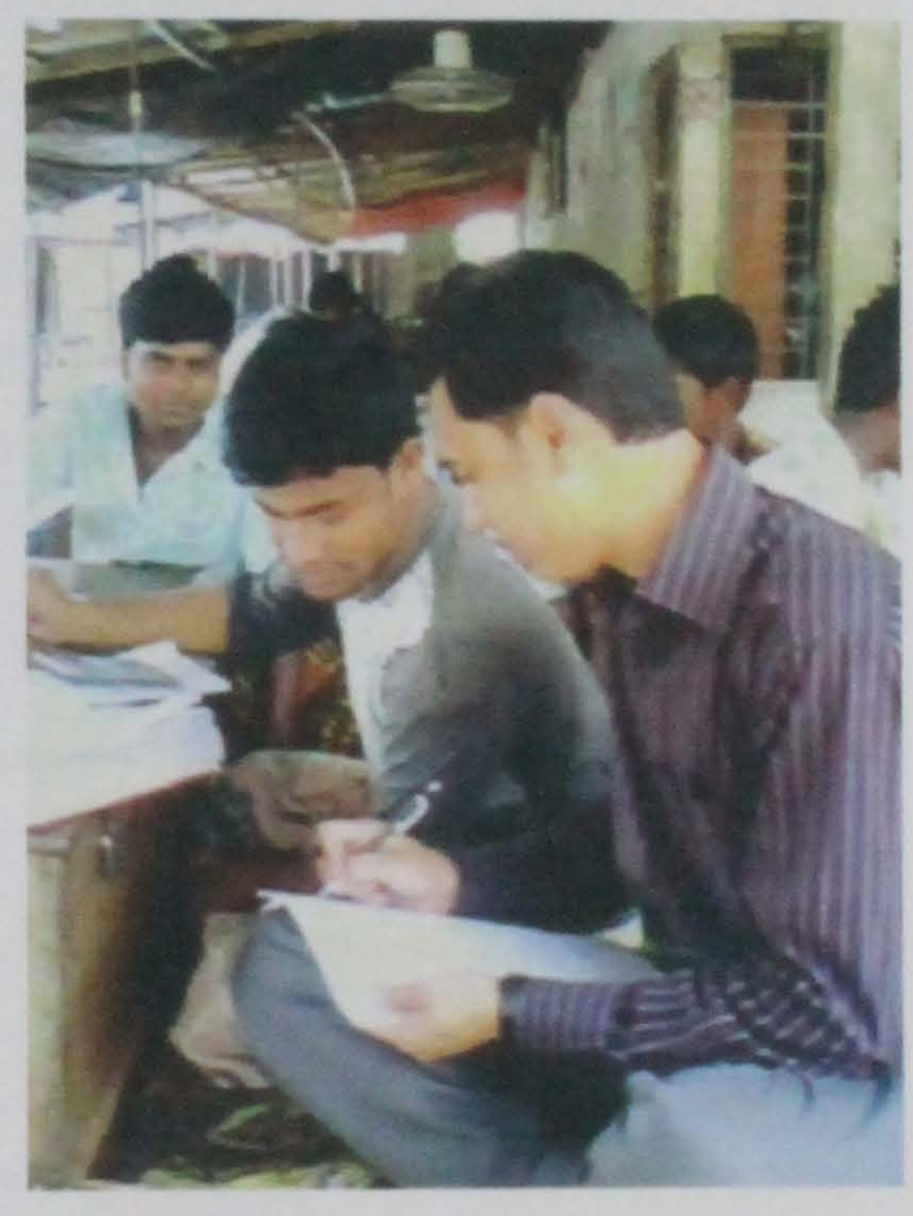

Plate: 2

Plates (1 & 2): Shows the data collection from aratdars in Trishal market

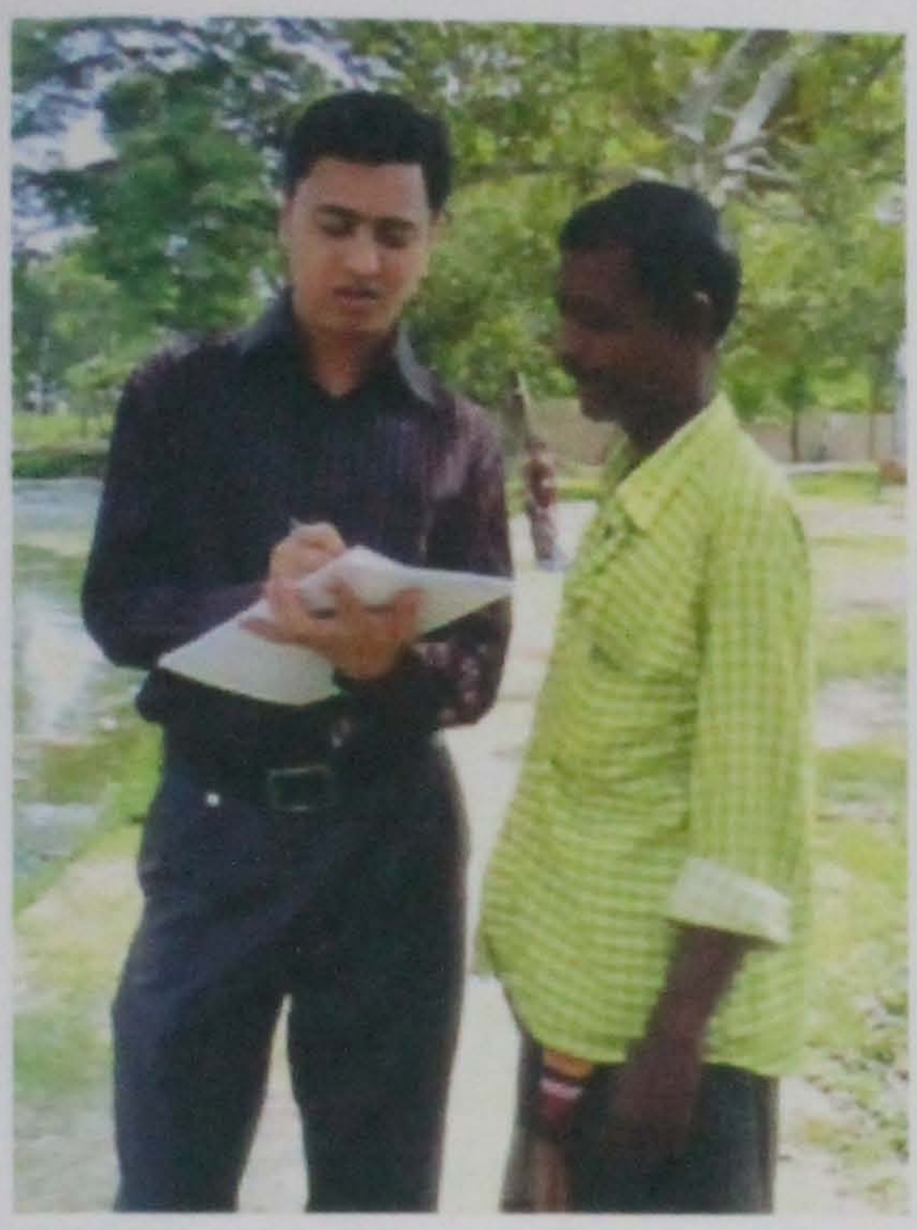

Plate 3

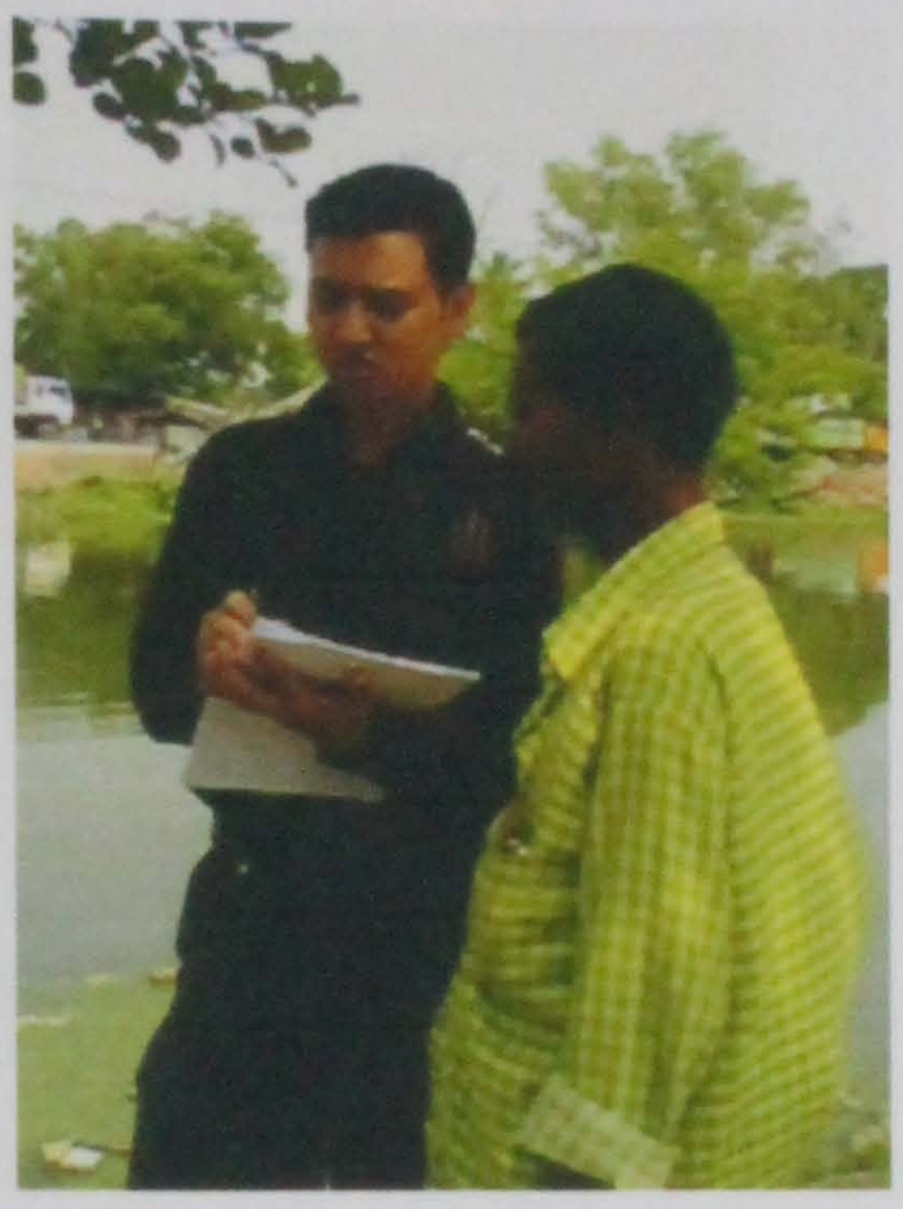

Plate 4

Plates (3 & 4): Showing the data collection from fish farmer

Plate 5

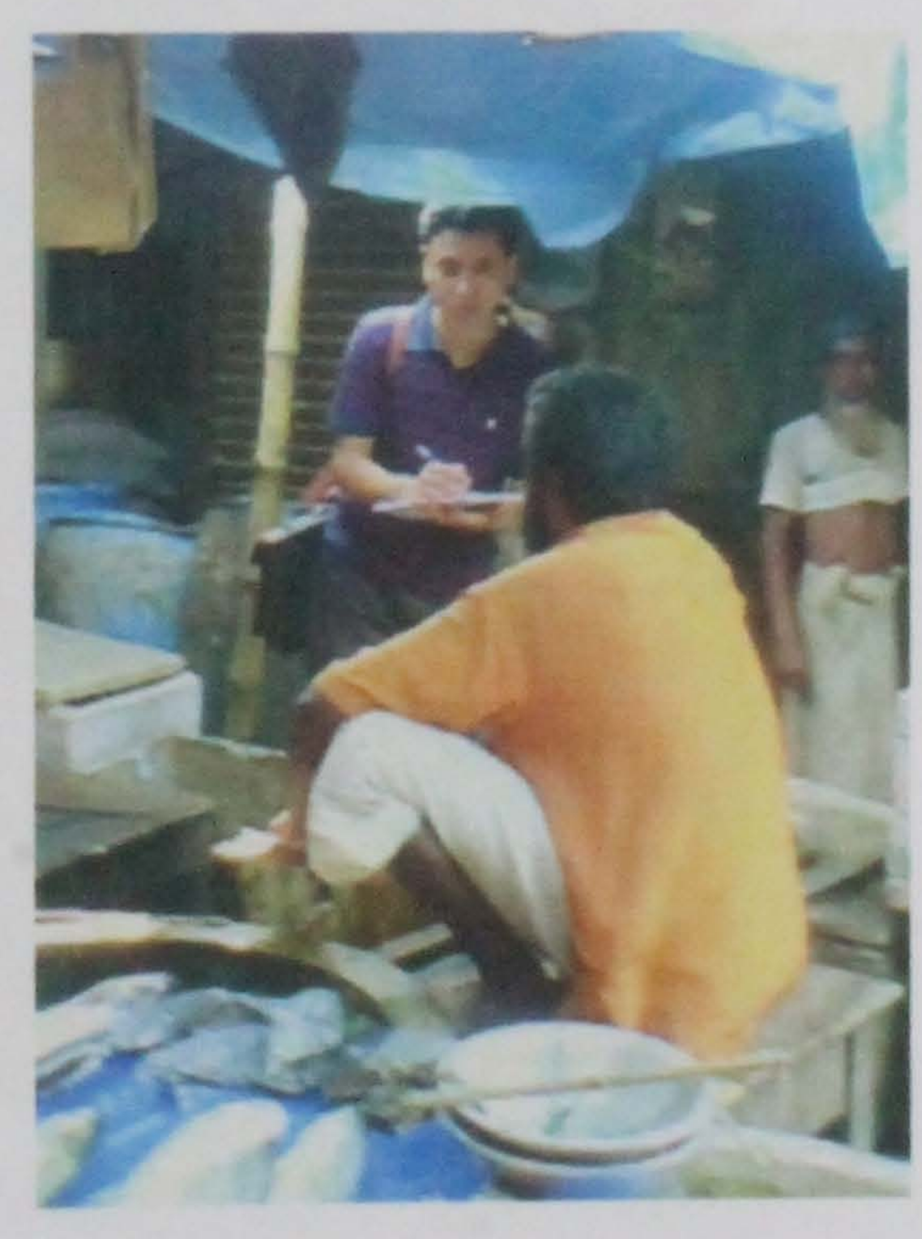

Plate 6

Plates (5& 6): Showing the data collection from fish retailer

Plate 7

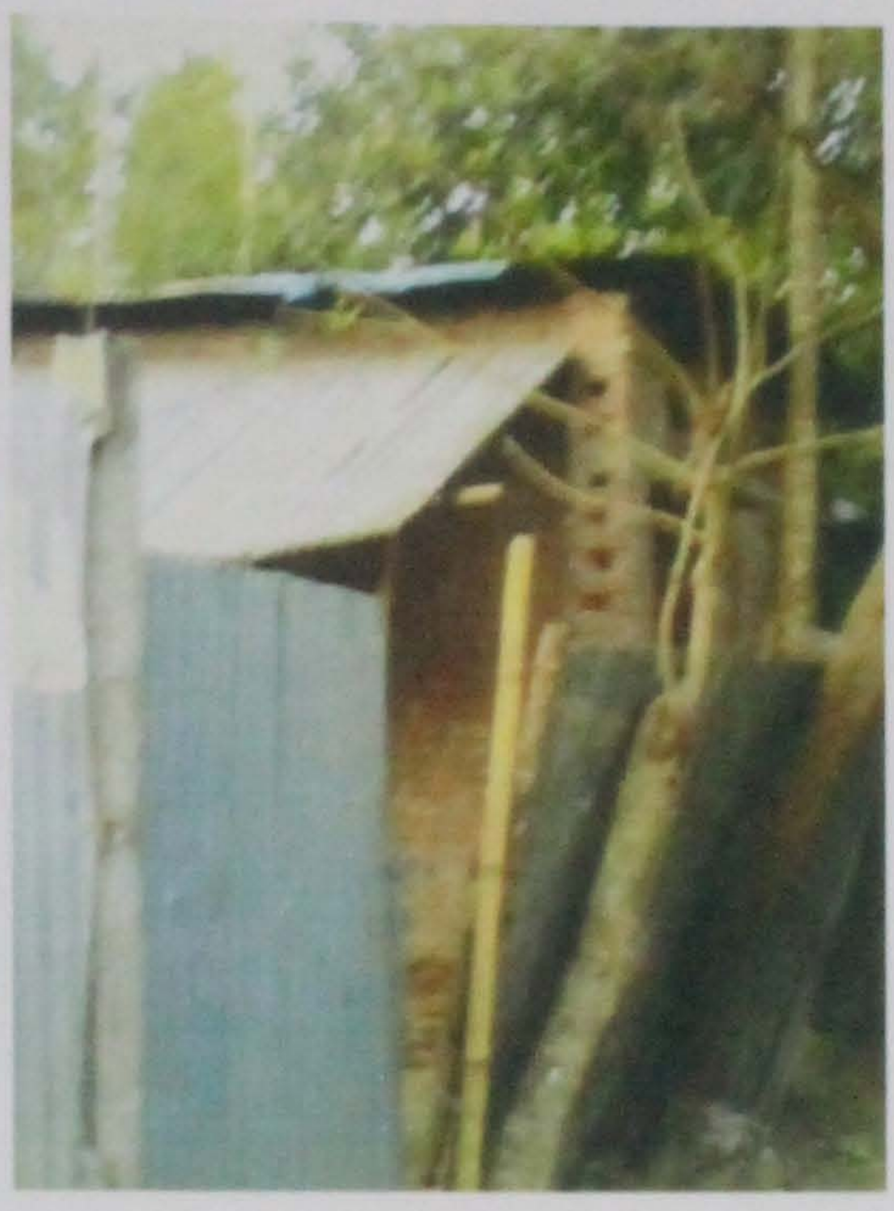

Plate 8

Plates (7& 8): Showing the housing condition of respondents

Plate 9

Plate 10

Plates (9& 10): Showing the housing condition of respondents

3.8 Data processing, Analysis and Presentation

The collected data were summarized and processed for analysis. These data were verified to eliminate all possible errors and inconsistencies. Tabular technique was applied for the analysis of data by using simple statistical tools like averages and percentages. Finally, the processed data were transferred to a master sheet from which classified tables were prepared revealing the finding of the study. For processing and analysis purpose, MS Excel and MS word have been used. Tables and bar diagram had been used for data processing and analysis.

Chapter-IV

RESULTS

4.1 Socio economic status of fishermen

4.1.1 Age structure

The table reveals that about half (52%) of the respondents in respect of aratdar belong to middle age group, while the highest percentage (48%) of fish farmers was in middle age. On the contrary, the maximum percentage (48%) of fish retailers was young. Whereas, only 24% of the fish retailers represented middle age group. In case of aratdar young people was engaged in this type of business at very low proportion (16%). The majority (32%) of old aged respondents was observed in term of aratdar. On the other hand, 28% of old aged people were found to be engaged in both fish farming activities and fish retailing.

Table 1. Age structure of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Young age (18-35)	4	16	6	24	12	48
Middle age (36-50)	13	52	12	48	6	24
Old age (Above 50)	8	32	7	28	7	28

4.1.2 Marital status

In the study area it was found that the majority of the respondents was married in case of aratdars (76%), fish farmers (88%) and fish retailers (60%). Whereas about 24% of aratdars belonged to unmarried group and 12% of farmers was unmarried. But considering fish retailers 40% of the respondents represented unmarried status.

Table 2. Marital status of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Married	19	76	22	88	15	60
Unmarried	6	24	3	12	10	40

4.1.3 Educational status

The result revealed that 60% of aratdars had education up to primary level and only 16% got education up to secondary level. On the other hand, 24% of the aratdars belonged to secondary group. In case of fish farmer 72% of the respondents had primary education and 20% had secondary education while only 8% belonged to higher secondary group.

The majority (92%) of fish retailers had no education to primary level education where as only 8% had secondary education. No respondent was found in higher secondary level.

Table 3. Educational status of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Illiterate	-	-	-	-	5	20
Primary	15	60	18	72	18	72
SSC	6	24	5	20	2	8
HSC	4	16	2	8	-	-

4.1.4 Religion

It was observed that Muslims were featuring as the absolute majority of the respondents in the study area. About 68% and 32% of aratdars were Muslim and Hindu respectively. In case of fish farmers the highest percentage (80%) of the respondents was Muslim

while only 20% was Hindu. About 76% and 24% of the respondents were Muslim and Hindu respectively in case of fish retailers.

Table 4. Religious status of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Muslim	17	68	20	80	19	76
Hindu	8	32	5	20	6	24
Others	-	-	-	-	-	-

4.1.5 Family type

There were two types of family in the study area such as joint family and nuclear family. For the all three cases the highest percentage of respondents belongs to nuclear family group. In case of aratdars, 64% of the respondents had nuclear family where as 36% lived in joint family. About half (56%) of fish farmers represented nuclear family while 44% of fish farmers had joint family. The great majority of the fish retailer was interested to live separately. On the other hand only 20% of the retailers liked to live in joint family.

Table 5. Family type of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Nuclear	16	64	14	56	20	80
Joint	9	36	11	44	5	20

4.1.6 Family size

In the study area the highest percentage (72%) of the retailers had small family compared with family size of aratdar and fish farmer where as about 28% of fish retailer had medium to large family.

In case of aratdars the largest percentage (40%) was observed in medium family group, while 28% had small family. It was also revealed that the majority of the fish farmers had medium to large family where as only 20% of the respondents had small family.

Table 6. Family size of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Small(1-4)	7	28	5	20	18	72
Moderate (5-8)	10	40	13	52	4	16
Large (above 8)	8	32	7	28	3	12

4.1.7 Annual income

During the study period it was observed that the maximum (68%) of aratdars had high income while 8% had low income. On the other hand, the majority (80%) of fish farmers had high to medium annual income, while 20% of fish farmer earned below 1lakh BDT per year. In case of fish retailers 56% of the respondents had low income while 32% and 12% of fish retailers had medium and high annual income respectively.

Table 7. Annual income of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
High (>200000)	17	68	12	48	3	12
Moderate (100000-200000)	6	24	8	32	8	32
Low(<100000)	2	8	5	20	14	56

4.1.8 Fish related experience

The table reveals that the highest percentage (76%) of aratdars had high to moderate experience in their own business. Whereas 8% of aratdars was new in this types of activities. The lower majority (28%) of the fish farmers had low to no experience in farming practice. On the contrary, 32% and 40% of the fish farmers had high to moderate experience in fish farming activities. Considering fish retailers it was observed that 40% of the respondents were highly experienced and 32% of retailers were experienced in fish retailing for about 4-6 years. Only 18% of the respondents had just initiated their retailing business in the study area.

Table 8. Fisheries related experience of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Absent	2	8	1	4	2	8
low(1-3)	4	16	6	24	5	10
Moderate (4-6)	8	32	10	40	8	32
High (>6)	11	44	8	32	10	40

4.1.9 Land area

In the study it was found that the great majority (88%) of the aratdars had small to medium land area where as only 12% had large land area. On the other hand the highest percentage (64%) of fish farmers belonged to large group while 12% of the fish farmer had small land area. In case of fish retailers the maximum of the respondents (68%) possessed small land area where as very low percentage (8%) had large land area.

Table 9. Land area of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Small (<0.5ha)	12	48	3	12	17	68
Moderate (0.5-1ha)	10	40	6	24	6	24
Large (>1ha)	3	12	16	64	2	8

4.1.10 Savings

From the study it was revealed that fish farmer saved more money compared with aratdars and fish retailers. In case of aratdar the maximum of the respondents (60%) had moderate savings while 28% had high savings. On the contrary the great majority (92%) of fish farmer had moderate to high savings where as only 8% had low savings. In respect of fish retailers most of the respondents (72%) had low savings while only 8% was able to save higher amount from their annual income.

Table 10. Savings of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
low(<10000)	3	12	2	8	18	72
Moderate (10000-50000)	15	60	6	24	5	20
High (>50000)	7	28	17	68	2	8

4.1.11 Housing condition

It was evident from data that about half (48%) of the aratdar had pacca and 40% of the aratdars had semi-pacca house. Whereas, only 12% of the aratdar lived in kacha house. In case of fish farmers the maximum of the respondents (64%) had semi-pacca house where as 24% and 12% of the fish farmers had kacha and pacca house respectively. None of the fish retailer had pacca house. Most of them spent their life in kacha house and the percentage of those fish retailer was 80% where as 20% of fish retailer had semi-pacca house.

Table 11. Housing condition of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Kacha	3	12	6	24	20	80
Semi pacca	10	40	16	64	5	20
Pacca	12	48	3	12	-	-

4.1.12 Sanitation facilities

It was observed that sanitation condition of aratdar and fish farmer was better than fish retailers. Maximum (56%) of aratdars had pacca toilet and 36% of them had semi-pacca toilet where as only 8% had kacha toilet. On the other hand, the highest percentage (64%) of fish farmers had semi-pacca toilet while 16% and 20% of the fish farmers had kacha and pacca toilet respectively. In case of fish retailers the great majority (96%) of the respondents had kacha to semi-pacca toilet facilities, whereas very low (4%) percent of fish retailers was able to construct pacca toilet.

Table 12. Sanitation facilities of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Kacha	2	8	4	16	11	44
Semi pacca	9	36	16	64	13	52
Pacca	14	56	5	20	1	4

4.1.13 Health facilities

The health facilities enjoyed by the respondents in the study area were not at all up to satisfactory level except in case of aratdars.In the present study area it was observed that the highest percentage (80%) of the aratdars went to upazila health complex for treatment where as only 20% of aratdars was dependent on kabiraz and unskilled village doctor. On the contrary about half (52%) of fish farmers in the study area was far away from getting standardized health facilities, while 48% of the fish farmers got health service from upazila health complex. In case of fish retailers the highest percentage (64%) of the respondents relied on non scientific health facilities from kabiraz and village doctor. Whereas, 36% of the fish retailers enjoyed health service from upazila health complex.

Table 13. Health facilities of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Kabiraz	2	8	5	20	8	32
Village Doctor	3	12	8	32	8	32
Upazila Health Complex	20	80	12	48	9	36

4.1.14 Electricity Facilities

In the study area the maximum (88%) of aratdars, 72% of fish farmers and 60% of fish retailers had electricity facilities. On the other hand, only 12% of aratdars was not able to get electric facilities while 28% of fish farmers had no electric facilities. And 40% of fish retailers was far away from electricity facilities.

Table 14. Electricity facilities of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Present	22	88	18	72	15	60
Absent	3	12	7	28	10	40

4.1.15 Drinking water facilities

The provision of clear and safe drinking water was considered to be the most valuable element in the society. Among the three types of respondents categories 100% of aratdars and fish farmers used own tube well water for drinking purpose. In case of fish retailers the majority of the respondents had own tube well for their drinking purpose while 2% of fish retailers household used water from various sources like pond, cannel, river, etc without purifying for drinking.

Table 15. Drinking water facilities of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Tubewell	25	100	25	100	23	92
Pond Water	-	-	-	-	-	-
Others	-	-	-	-	2	8

4.1.16 Education of children

In the study area it was found that the maximum (88%) of aratdars sent their children to school where as 12% of them was not interested to send their children to school. In case of fish farmers the highest percentage (80%) of the respondents was found to send their children to school while children of 20% of the fish farmers was not school going. On the other hand the majority 72% of fish retailers sent their children to school where as 28% of them belonged to not schooling of children categories.

Table 16. Educations of children of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
School going	22	88	20	80	18	72
Not school going	3	12	5	20	7	28

4.1.17 Annual expenditure

About 72% aratdars had high annual expenditure where as only 12% of the respondents expend their income at low level. In respect of fish farmers the maximum percentage (84%) had high to moderate annual expenditure while only 16% had low expenditure. On the other hand the annual expenditure of fish retailers was found to be in low categories for 56% of respondents whereas 20% of fish retailers belonged to high expenditure group and 24% had moderate annual expenditure for their livelihood.

Table 17. Annual expenditure of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
High (>1.5 lakh)	18	75	14	56	5	20
Moderate (1-1.5lakh)	4	16	7	28	6	24
Low (<1 lakh)	3	12	4	16	14	56

4.1.18 Transportation facilities

During the study period it was observed that about half (52%) of aratdars had small vehicles and 20% had own motor vehicles. Whereas, 28% of aratdars had none. The majority (60%) of the fish farmers transported products by their own small vehicles. Whereas 32% depended on hired vehicles and only 8% had motor vehicles. On the other hand the great majority of the fish retailers had small vehicles whereas 12% had none.

Table 18. Transportation facilities of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
Absent	7	28	8	32	3	12
Motor vehicles	5	20	2	8	-	-
Small vehicles	13	52	15	60	22	88

4.1.19 Credit received

From the survey it was observed that 80% of the aratdars received credit from different NGO's and banks while the rest (20%) of the aratdars used their own capital for their business. On the contrary the great majority of the fish farmer received loan for fish farming activities while only 8% belonged to no credit receiving group. In case of fish retailer about 60% of the respondents enjoyed microcredit facilities from various NGO's while 32% of fish retailer received moderate to high loan and the rest (8%) of the respondents did not receive credit.

Table 19. Credits received of aratdars, fish farmer and fish retailer

Categories	Aratdar		Fish farmer		Fish retailer	
	No. of respondents	Percentage in the communities	No. of respondents	Percent composition	No. of respondents	Percent composition
No	5	20	2	8	2	8
Low	5	20	5	20	15	60
Moderate	12	48	15	60	5	20
High	3	12	3	12	3	12

4.2 Problems confronted by respondents

The following problems were stated by aratdars in the study area

- Declining fish supplies, resulted towards loss of business.
- Lack of financial support through loans at preferential interest rates;
- Lack of institutional support , such as better infrastructure or advice;
- Road access to markets is often too narrow, markets lack shelter etc.
- In some places, lack of ice factory and public cold storage.

Constraints typically expressed by fish farmers:

- Depletion of fish stocks and catches ;
- Lack of capital, which forced people to take out dadan; as a result of the latter they only get a reduced price for their catch after deduction of a differential by the dadandar;
- In some remote areas, lack of market information and transport;

- Vendalism i.e. theft of boats, nets, and engines.

Constraints typically expressed by retailers

- Lack of infrastructure, i.e. drainage, roofing, handling facilities;
- Poor accessibility of market, i.e. higher income consumers cannot access the market by car due to road congestion.

4.3 Fish marketing system

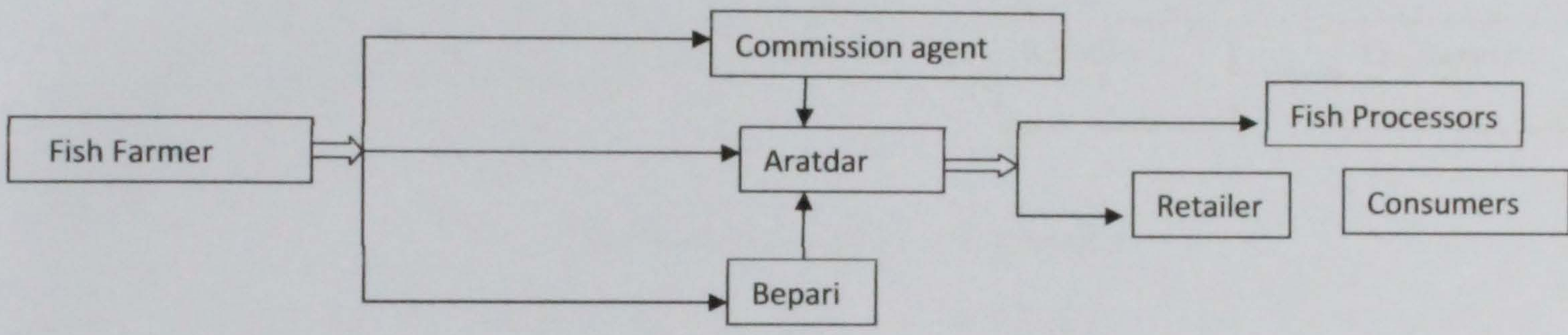

Fig. Marketing channel of aratdar

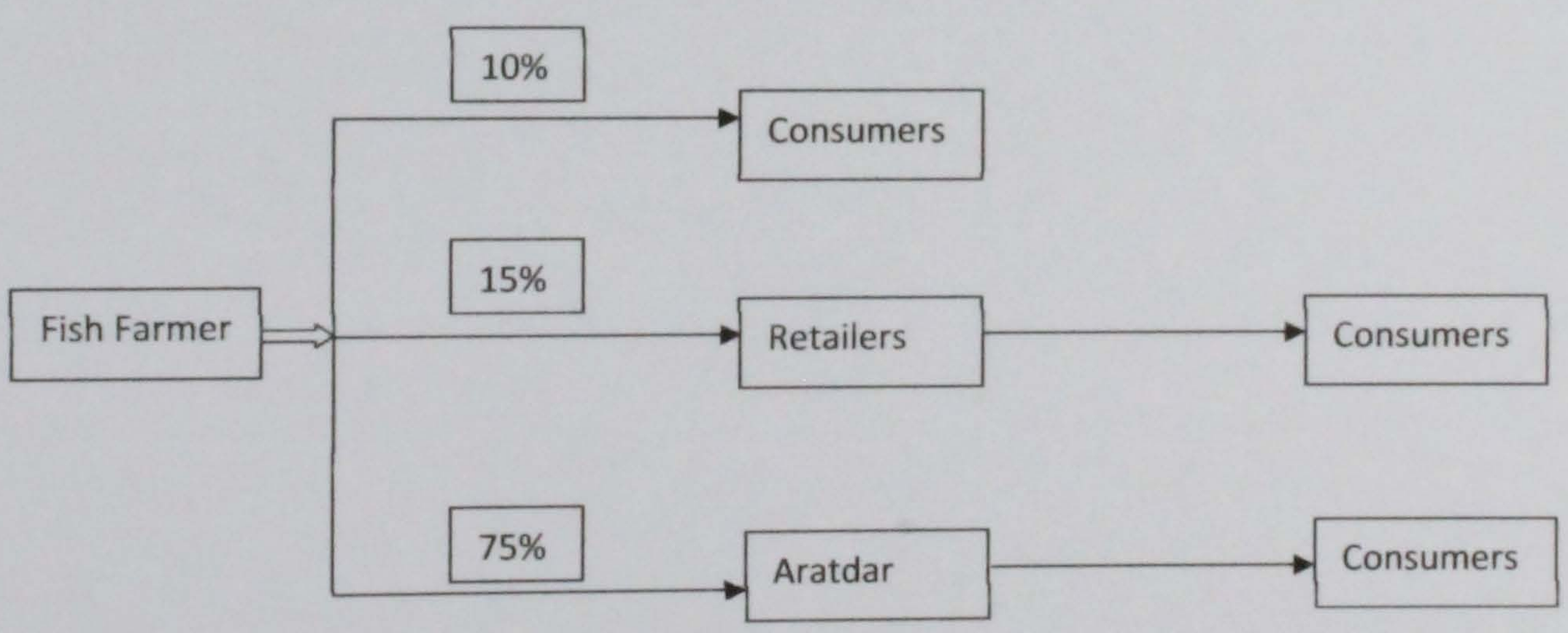

Fig. Marketing channel of fish farmer

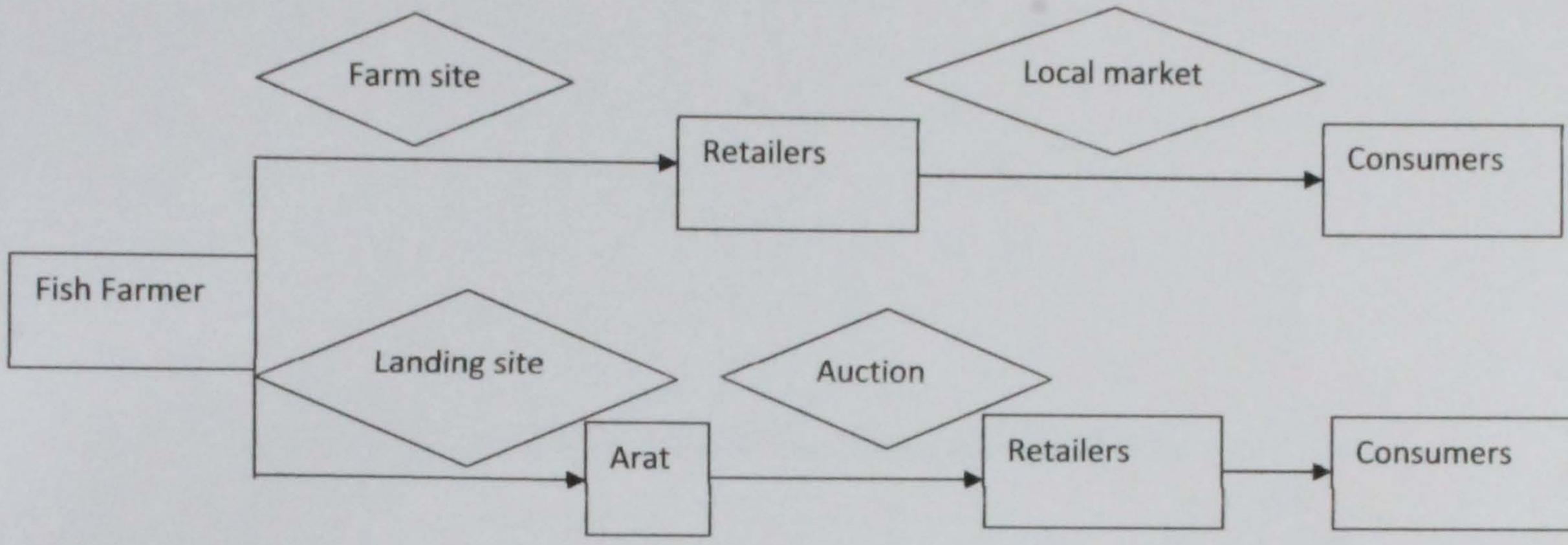

Fig. Marketing channel of fish retailer

Chapter-V

DISCUSSION

Age structure

In the present study, about half (52%) of aratdars belong to middle age group, while the highest percentage (48%) of fish farmer was in middle age.

On the contrary, the maximum percentage (48%) of fish retailer was young. whereas only 24% of the retailer represented middle age group. In case of aratdar young people was engaged in this type of business at very low proportion (16%) whereas around 24% of young respondents was involved in fish retailing. The majority (32%) of old aged respondents was observed in term of aratdar. On the other hand, 28% of old aged people were found to be engaged in both fish farming activities and fish retailing. Rabbani (2007) recorded age group of 25-50 years was highest (46.67%) and more than 50 years were the lowest (25%) of the riverine fishermen in the Karatua rive, which is similar to the present findings.

Educational status

The highest 60% of aratdar had education up to primary level and only 16% got education up to secondary level. On the other hand, 24% of the aratdars belonged to secondary group. In case of fish farmer 72% of the respondents had primary education and 20% had secondary education while only 8% belonged to higher secondary group. The majority (92%) of fish retailers had no education to primary level whereas only 8% had secondary education. No respondent was found in higher secondary level. Rabbani (2007) reported that 20% of riverine fishermen were illiterate, 71.67% of riverine fishermen were up to primary level of education and 8.33% riverine fishermen had only secondary level of education. It might be due to most of the sampled fishermen were compelled to enter into the fishing profession in their early stage due to poor economic status of their parents and lack of awareness about education.

Religion

The fishermen communities of Bangladesh include people of various castes and status. Though conceived anthropologically that the low caste Hindus constitute the fishermen communities in Bangladesh, by the process of social and economic mobility people from

other religions have already been dominating in fishery sector especially inland capture fishery. In the present study, Muslims were featuring as the absolute majority of the respondents in the study area. About 68% and 32% of aratdars were Muslim and Hindu respectively. In case of fish farmer the highest 80% of the respondents was Muslim while only 20% was Hindu. About 76% and 24% of the respondents were Muslim and Hindu respectively in case of fish retailer. Graaf *et.al*. (2001) stated that in the last decades the number of muslims having fishing as a major occupation increased, which is similar to the present findings.

Family type

In the present study it was found that for the all three cases the highest percentage of respondents belonged to nuclear family group/categories. In case of aratdar, 64% of the respondents had nuclear family where as 36% lived in joint family. About half (56%) of fish farmer represented nuclear family while (44%) of fish farmer had joint family .The great majority of the fish retailer was interested to live separately. On the other hand only 20% of the retailer liked to live in joint family, which is more or less similar to the findings of Roy (2010), who found that 56% of fishermen were in joint family and 44% were in nuclear family.

Family size

In the study area the highest percentage (72%) of the respondents had small family compared with family size of aratdars and fish farmers where as about 28% of fish retailers had medium to large family. In case of aratdars the largest percentage (40%) was observed in medium family groups, while 28% had small family. It was also revealed that the majority of the fish farmer had medium to large family whereas only 20% of the respondents had small family, which is similar to the findings of Halder (2002) recorded the largest family size (6.67 persons) and smallest family size (4.50 persons) of fishermen of Doba beel, Sunamganj.

Annual Income

The maximum (68%) of aratdar had high income while 8% had low income. On the other hand, the majority (80%) of fish farmer had high to medium annual income, while 20% of fish farmer earned below 1lakh BDT per year. In case of fish retailer 56% of the

respondents had low income while 32% and 12% of fish retailer had medium and high annual income respectively, which is more or less similar to the findings of Hossain (2007) who reported that the highest monthly average income was found in fish farmer group and the lowest monthly average income was found in the retailer group in the Kolimar haor, Itna, Kishorgonj.

Land area

In the present study it was found that the great majority (88%) of the aratdar had small to medium land area where as only 12% had large land area. On the other hand the highest 64% of fish farmers belonged to large group while 12% of the fish farmer had small land area. In case of fish retailers the maximum of the respondents (68%) possessed small land area where as very low percentage (8%) had large land area. Roy (2010) noted that the highest value (27.77%) was found in fishermen in medium land area group, which is more or less similar to the findings of present study.

Savings

Respondents were divided into 4 groups such as no saving, low saving, medium savings, and high saving. It appears that fish farmers saved more money compared with aratdars and fish retailers. In case of aratdars the maximum of the respondents (60%) had moderate savings while 28% had high savings .On the contrary the great majority (92%) of fish farmers had moderate to high savings where as only 8% had low savings. In respect of fish retailers the most of the respondents (72%) had low savings, while only 8% was able to save higher amount from their annual income. It might be due to their annual income and annual expenditure as well as related to their family size.

Housing condition

There are three types of house in the present study area such as i) kacha ii) semi pacca and iii) pakka. From the study, it was known that half (48%) of the aratdars had pacca and 40% of the aratdars had semi-pacca house, whereas only 12% of the aratdars lived in kacha house. In case of fish farmers the maximum of the respondents (64%) had semi-pacca house where as 24% and 12% of the fish farmers had kacha and pacca house

respectively. None of the fish retailer had pacca house and the percentage of those fish retailer was 80% where as 20% of fish retailer had semi-pacca house.
Ahmed (2002) found that in Mymensingh area, (62%) of fishermen house structure were kacha, which is similar to the present findings.

Sanitary facilities

In the study area it was found that sanitation condition of aratdar and fish farmer was better than fish retailer. Maximum (56%) of aratdar had pacca toilet and 36% of them had semi-pacca toilet whereas only 8% had kacha toilet. On the other hand, the highest percentage (64%) of fish farmer had semi-pacca toilet while 16% and 20% of the fish farmers had kacha and pacca toilet respectively. In case of fish retailer the great majority (96%) of the respondents had kacha to semi-pacca toilet facilities, whereas very low (4%) percent of fish retailer was able to construct pacca toilet, which is more or less similar to the findings of Alam (2006), who found in his study that only 24% had good sanitation condition using pacca toilets.

Health facilities

Respondents were required to state the types of health services that they could afford for their health maintenance/facility. A family may be said to well serve in health facilities when all of its members have sustainable access to the medical care needed to be free from debilitation and preventable, health problems. The health facilities enjoyed by the respondent in the study area were not at all satisfactory level except in case of aratdars. In the present study area it was denoted that the highest percentage (80%) of the aratdars went to upazila health complex for treatment whereas only 20% of aratdar was dependent on kabiraz and unskilled village doctor.
On the contrary about half (52%) of fish farmer in the study area was far away from getting standardized health facilities, while 48% of the fish farmer got health service from upazila health complex. In case of fish retailers the highest proportion (64%) of the respondents relied on non scientific health facilities from kabiraz and village doctor, whereas; only 36% of the fish retailer enjoyed health service from upazila health complex, which is similar to the findings of Alam (2006) who found in his study that only 42% of the farmers in the Mithapuqur upazila under the Rangpur district got the

opportunities for medical care by MBBS doctor and Upazila health complex while the rest 58% was dependent on village doctor and others.

Marketing system

Fish marketing in Bangladesh is largely controlled by the private sector. Three to four intermediaries operate between producer and final consumer.

In Trishal upazila, the dominant marketing channel (product route to ultimate consumers) of freshwater fish for domestic consumption includes farmer-bepary-aratdar-paiker(2)/ retailer-consumer. This simple channel covers primary and secondary market levels up to upazila. Baparies handle a large volume of fish and sell their purchases to Aratdars and to Paikers/ retailers. Baparies do not generally hold any trade licenses, unlike Aratdars. They can be local or non-local traders. Some Beparies get advance business loans from the Aratdars during lean periods and on the condition that they will sell their purchases through Aratdars. From the higher secondary markets, fish flow-down again to the town and peripheral village primary markets (final consuming markets) through Paikers/retailers. The least informed party is the fisherman, because of his physical isolation from the markets. Other factors which weaken the fishermen bargaining position are his dependence on credit and illiteracy.

With the growth in commercial pond fishery, a new pattern in the marketing channel was occurred that affects production points, primary markets/landing areas, higher secondary markets and consuming areas/retail markets (Alam, 2000). After harvest pond fish farmers directly approach Aratdars at the higher secondary market. Fish farmers get 8-10% of the total sale proceeds from the lot of each catch. The farmers bear the transportation costs to the Aratdars in the markets and arrange bidding for open sales of fish to paikers/retailers.

In lieu Aratdars in the markets and fish landing, icing for some fish and selling, Aratdars get commission at different rates of the sale proceeds. For example, commission for Hilsa fish is 3%, for carps 4%, rohu, catla, mrigal 6.20% in Mymensingh and Kishoregonj markets.

At the primary market level, the main constraint for fish farmers are lack of bargaining power and market information and barriers to entry in the market. Lack of transport is

primary markets. Physical facilities and infrastructure in all types of market are far from satisfactory. Most primary/village markets do not have facilities for electricity, water, ice, or shelter. Fish sellers in the majority of rural and primary markets sit under the open sky. Secondary and higher level markets have better facilities, though in general, conditions in urban and retail markets are far from satisfactory with regard to stalls, parking, spacing, sanitation, drainage and management.

In case of housing condition the majority (80%) of fish retailer had kacha house while 64% of fish farmer had semi-pacca house and 48% of aratdar had pacca house. On the other hand, 56% of aratdar and 64% of fish farmer had pacca and semi-pacca latrine respectively.

The highest (80%) and 48% of aratdar and fish farmer enjoyed health advice from Upazila health complex where as only 36% of fish retailer was able to take health facilities from Upazila health complex.

It was observed that the majority (75%) of aratdar and 56% of fish farmer had high annual expenditure where as 56% of fish retailer expends their money below one (1) lakh annually. The great majority of the respondents received credit either from NGOs or banks and the percentage was calculated as 80% for aratdar, 92% for both fish farmer and fish retailer each.

In fish marketing system, there were a number of middlemen involved in Trishal Upazila. The market chain from farmers to consumers passes through a number of intermediaries: local fish retailers, agents, whole salers and retailers. With a few exceptions, farmers never directly communicate with consumers, market communication normally being made through middle men. The middle men usually buy the fish from the farmers but do not seem to have formal agreements with particular producers.

Overall, from this study it could be concluded that aratdar, fish farmer and fish retailer were mostly less educated, lack of awareness about health facilities, having low sanitation but preferred to save money for future livelihood management. In order to uphold the socio-economic conditions of the respondents of the study area institutional credit systems should be provided with no or low interest rate for the fishermen at their crisis moment. Educational institution should be set up in the village and the respondents should motivate towards school in order to improve their educational status. Support organization should be developed in that area to improve proper knowledge and ability to work among fishermen community.

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