USE OF COMMUNICATION MEDIA BY THE FARMERS REGARDING FISH FARMING

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CERTIFICATE

This is to certify that the thesis entitled ***"USE OF COMMUNICATION MEDIA BY THE FARMERS REGARDING FISH FARMING"*** *submitted to the faculty of agriculture, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of* ***MASTER OF SCIENCE in AGRICULTURAL EXTENSION****, embodies the result of a piece of bonafide research work carried out by* ***Md. Hasibul Haque****, Registration No.* ***08-03156*** *under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

I further certify that such help or source of information, as has been available during the course of this investigation has duly been acknowledged.

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Dedicated to

My

Beloved Parents

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ABSTRACT

The focus of the present study was to determine the extent of use of communication media by the farmers regarding fish farming and to explore the relationships between the extent of use of communication media by the farmers and the eleven selected characteristics of the fish farmers. Data were collected from 112 randomly selected fish farmers of four selected villages of Jugli union under Haluaghat upazila of Mymensingh district. Data were collected by using an interview schedule from the respondents during 5 to 25 September, 2015. Nine (9) communication media of different nature were selected to measure the extent of use of communication media by the fish farmers. The highest proportion (36.61 percent) of the respondents had low communication media use, while 29.46 percent had high communication media use. Pearson's Product Moment Correlation analysis showed that, capital for fish farming, fish cultivation area, annual income from fish culture, organizational participation, innovativeness regarding fish farming, fish farming knowledge of fish farmers had significant positive relationship with their extent of use of communication media. However, age, level of education, fish farming experience, fish farming facilities and problem faced in fish farming had no significant relationships with the extent of use of communication media by the fish farmers.

CHAPTER 1
INTRODUCTION

1.1 General Background of the Study

Fish is the second most valuable agricultural sector in Bangladesh and its production contributes to the livelihoods and employment of millions of people. The culture and consumption of fish therefore has important implications for national income and food security. Fisheries sector contributes 3.69 % to the national GDP and 22.60% of the total agricultural GDP (BER, 2015).

Fisheries and aquaculture sector have emerged as the second most important contributors in export earnings of Bangladesh. It is the second largest export industry in Bangladesh and produces 2.5 percent of the global production of shrimp (FAO, 2014). In 2013-2014 fiscal year the country export 0.77 lac MT fish & fisheries product and earn 4898.22 crore tk as foreign revenue (BER, 2015). In t 2014-2015 fiscal year (up to January , 2015) the country export 0.52 lac MT fish & fisheries product and earned 3204.24 crore tk as foreign revenue (BER, 2015) . In 2013-2014 fiscal year the country produced 35.48 lac MT fish and the target for 2014-2015 fiscal is 37.03 lac MT (BER, 2015).

Bangladesh is now the fourth major fish producing country in the world as it has raised production from 7.5 lakh metric tonnes to 35 lakh metric tonnes in last three decades. According to "The State of World Fisheries and Aquaculture 2014", Bangladesh currently produces around 34.9 lakh MT of fish a year following China, India and Myanmar. Out of the total production, around 20 lakh MT comes from aquaculture.

Fish is the primary source of animal protein for Bangladeshi population, especially poor rural households. About 60% animal protein comes from fish (BER, 2015). According to a survey of 2010, the annual per head consumption of fish in Bangladesh is 12kg. The people of Chittagong consume the most fish

at an annual 17kg per head and the least is in Rangpur at 7.5k per head. Annual fish consumption globally is 22.4kg per head (FAO, 2014). FAO predicts Bangladesh will be the first of the four countries to achieve massive success in fish production by the year 2022 (FAO, 2014). So, there is a great scope for us to increase our production because Bangladesh is considered as one of the most suitable countries in the world for small-scale freshwater rural aquaculture due to its favorable resources and agro-climatic conditions

Fisheries sector supports livelihood to about twelve million people of the country directly or indirectly (DoF, 2015). Production statistics showed that total fish production in Bangladesh has increased but not sufficient to fulfill our national demand. As a result people intake less amount of protein but fish is the main source of animal protein and essential nutrients in the people's diet. Thus, to ensure the consumption of required level of protein and other essential nutrients, more fish production is one of the important strategies in Bangladesh.

In fisheries development, the role of communication is of important in transfers of latest technologies from research stations to the end users for the development of fisheries. Extension agents use a variety of communication channels to deliver information. Numerous studies show producers prefer a combination of communication channels getting information and specifically prefer a combination of interpersonal methods. As it was found that more than 90% of the farmers felt low to medium use of communication media (Islam, 2009 and Akhter, 2011). More than half (53.90 percent) of the respondents had medium use of mobile phone (Barman, 2009) and majority (91.11 %) of the farmers fell in the rarely use of communication media in practicing rice cum fish culture (Hossain, 2010).To make the fish farming communities informed of the use of latest technologies, the field extension functionaries require effective communication sources thus they can overcome the barriers of illiteracy and drive home the message effectively. In transferring information to the fish farming communities, one has to take into account the preference of fish farmers for the particular information source and media. Out of many

media sources fish farmers may use a few depending on the credibility of information source and channels perceived as by them. Considering the importance and role played by communication media in disseminating the fisheries information, the present study was carried out to investigate the use of communication media by the farmers in receiving information regarding fish farming. Table 1.1 shows annual fish production in inland fisheries of Bangladesh.

Table 1.1 Sector-wise annual fish production in inland fisheries (2013-2014)

Sector of Fisheries	Water Area (Hectare)	Total Production (Metric Ton)	%	Production/ Area (Kg/Hectare)
(i) Inland Open Water (Capture)				
1. River and Estuary	853863	167373	*4.72%*	196
2. Sundarbans	177700	18366	*0.52%*	103
3. Beel	114161	88911	*2.51%*	779
4. Kaptai Lake	68800	8179	*0.23%*	**119**
5. Floodplain	2695529	712976	*20.09%*	**265**
Capture Total	***3910053***	***995805***	***28.07%***	
(ii) Inland Closed Water (Culture)				
Pond	371309	1526160	*43.01%*	4110
Seasonal cultured water body	130488	193303	*5.45%*	1481
Baor	5488	6514	*0.18%*	1187
Shrimp/Prawn Farm	275274	216447	*6.10%*	786
Pen Culture	6775	13054	*0.37%*	1927
Cage Culture	7	1447	*0.04%*	22
Culture Total	***789341***	***1956925***	***55.15%***	
Inland Fisheries Total	**4699394**	**2952730**	**83.22%**	

(DoF,2015)

1.2 Statement of the Research Problem

Bangladesh is the 4th largest inland fish producing country in the world. The climatic condition of Bangladesh is suitable for fish production. But the per capita fish consumption is not satisfactory. According to FAO (2014), the per capita fish consumption in the world is 22.4 kg / year. But in Bangladesh it is about 12 kg/year against a minimum recommended requirement of 18 kg/year.

According to FAO (2014), in Bangladesh 57 percent animal protein comes from fish. So, there is still need to improve fish consumption in the country. Hence there is a great scope to increase the fish production. To increase the fish production communication media play vital role in disseminating new technologies to fish farmers. The success of any technology depends on its dissemination among the potential users which greatly depends on the information received by the farmers through different communication media. In view of the above discussion, the researcher was interested to undertake this research entitled, "Use of communication media by the farmers regarding fish farming". However, the purpose of the study was also to answer the following research questions:

I. What is the present status of using communication media by the fish farmers?
II. What characteristics of the fish farmers influence them to use communication media?
III. Which of the communication media are preferred by the farmers in receiving information regarding fish farming?

1.3 Objectives of the Study

To achieve the main purpose of the study, the following specific objectives were formulated:

1. To determine and describe the extent of use of communication media by the farmers in receiving information regarding fish farming
2. To determine and describe the following selected characteristics of fish farmers:
   i. Age
   ii. Level of education
   iii. Capital for fish farming
   iv. Fish cultivation area
   v. Annual income from fish culture
   vi. Organizational participation

vii. Innovativeness regarding fish farming

viii. Fish farming knowledge

ix. Fish farming experience

x. Fish farming facilities

xi. Problem faced in fish farming

3. To compare the use of different communication media

4. To explore the relationship between each of the selected characteristics of fish farmers and their extent of use of communication media in receiving information regarding fish farming

1.4 Scope and Justification of the Study

In Bangladesh fish farming plays a crucial role to the total national income. Economy of Bangladesh largely depends on the development of fisheries sector. Communication media will play important role for the development of fisheries sector through diffusion of technologies and information to the fish farmers'. Contact with different communication media is required to receive information and to use the technology in real situation. Transfer of technologies depends on the access to relevant communication media by the farmers and their willingness to use the available communication media in time. So, in transferring fish production technologies to the fish farmers, effective communication media is essential.

1.5 Assumptions of the Study

An assumption is the supposition that an apparent fact or principle is true in the light of available evidence. The following assumptions were in the mind of the researcher during conducting the study:

1. The respondents included in the sample for this study were capable enough to furnish proper responses to the question set up in the interview schedule.

2. Views and opinions furnished by the respondents included in the sample were the representative view and opinion of the whole population of the study area.
3. The responses furnished by the respondents were reliable.
4. The researcher who acted as interviewer was very well adjusted to the social and cultural environment of the study area. Hence, the respondents furnished there correct opinions without any kind of hesitation.
5. The data collected by the researcher were free from bias and they were normally distributed.
6. The respondents selected for the study were component to satisfy the quarries of the research.

1.6 Limitations of the Study

Considering the time, money and other resources available to the researcher and to make the study manageable and meaningful, it became necessary to impose certain limitations as noted below:

1. The study was confined to one selected union of Halaugaht upazilla under Mymensingh district.
2. The characteristics of the fish farmers in the study area were many and varied but only eleven of them were selected for this study.
3. The researcher relied on the data furnished by the fish farmers from their memory during interview.
4. There are many communication media from where fish farmers can receive information for their fish farming. But only nine communication media were selected for the study.
5. Reluctance of fish farmers to provide information was overcome by establishing proper rapport.
6. For some cases, the researcher faced unexpected interference from the over interested side-talkers while collecting data from the target populations. However, the researcher tried to overcome the problem as far as possible with sufficient tact and skill.

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this Chapter is to present the reviews of researches related to the investigation. The reviews are conveniently presented based on the major objectives of the study. This Chapter is divided into three sections. The first section deals with the findings on the of use of communication media by farmers ; second section is devoted to a discussion on the review of different findings of studies exploring relationship between the selected characteristics of the farmers and their extent of use of communication media and third section presents the conceptual framework of the study.

2.1 Extent of Use of Communication Media by the Farmers

Haruna *et al.* (2015) conducted a study on access of fisheries information to fish farmers in hajidia, Nigeria & found that the highest proportion (60 %) of the fish farmer receive information from extension workers, 21.67% from farmers and 18% from workshops.

Ronald *et al.* (2015) in his study showed that greater proportion 93% of the respondent preferred Television as their source of agricultural information, 91% preferred radio, 77% preferred agricultural input suppliers, 71% prefer mobile phones and the least source from newspapers, magazine and brochures.

The study conducted by Benard and Dulle (2014) in Tanzania revealed that the major sources of information used by farmers in accessing agricultural information were family/parents, personal experience, radio, neighbour and or friends and agricultural extension officers. Also the same study done by Lwoga (2009) and Swai (1998), in Tanzania show that farmers use village leaders, agricultural extension officers, newspapers and magazines, books, brochures, radio, TV and internet in accessing agricultural information.

Ahmed (2014) in his study found that highest proportion (58%) of the respondents had medium extension media contact while 41% had high extension media contact and nobody had low extension media contact.

Rahman (2014) conducted a study on problems faced by the fish farmers' in pangus culture. He found that 65.7% of the fish farmer had medium extension contact while 28.6% had high extension media contact and 5.7% had low extension media contact.

Naim (2014) found in a study that highest proportion (57.4%) of the respondents had very low extension media contact with their information sources, followed by 33.3% having low extension contact and 8% medium extension contact and only 1.3percent had no extension contact.

Afroz (2014) conducted a study on participation of rural women in integrated fish farming activities and found that 33.33% rural women had low communication exposure, 53.33% had medium communication exposure and 13.34% of them had high communication exposure. The findings of the study revealed that the majority of the respondents had medium to low exposure to different information sources. In the study area, it was observed that there was very little communication programme for women in specific.

Sumon (2014) conducted a study on training needs of the fish farmers on catfish culture and found that 58.0% of the fish farmers had medium communication exposure compared with 34.0% having low communication exposure and 8.0% having high exposure. Similar results were found by Ferdousi (2010), Hossain (2007), Yesmin (2007) Alam (2004), and Yeasmin (2013).

Sharmin (2013) in a study found that majority (52%) of the fish farmers had medium communication media use, 48% had high communication media use and no respondents were found to have low communication media use. The

commonly used communication media were model farmer and local extension agent for fisheries (LEAF). The other communication media such as Upazila Fisheries Officer (UFO), Assistant Fisheries Officer (AFO), NGO field worker, fish feed trader were also sources of information on the ten practices of commercial fish farming.

Hossain (2013) in a study on problem faced by the fish farmers in practicing aquaculture management revealed that Majority of the respondents 76.2% had low extension media contact, while 23.8% had medium and 0% had high media contact.

Salam (2013) in a study found that 92% of the fish farmers had medium communication exposure compared to 2% low communication exposure and 6% had high communication exposure. Ali (2012), Shanto (2011) found similar result.

Dhali (2013) in his study constructed a rank order for nine (9) extension media based on the mean item-wise score. Among the 9 communication media the first five communication media were Model farmer of DoF , Model farmer of NATP, Group discussions , Local Extension Agent of Fisheries (LEAF) of NATP and Upazila Fisheries Officer . It was found that 68 percent of respondents had low extension media contact, while 32 percent had medium extension media contact and interestingly there was no farmer who had high extension media contact. This finding clearly shows that most of the farmer had low to medium extension media contact which indicates inadequate extension service to these villages.

Akter (2013) in his study found that highest proportion (66.8%) of the fishermen had low communication exposure to (29.9%) medium and (3.3%) high communication exposure. Similar findings were reported by Islam (2009).

Rahman (2013) in his study revealed that the highest proportion (93.3%) of the respondents had low communication exposure while, (6.7%) had medium and (0%) had high communication exposure. The findings clearly indicated that most of the fish farmers (100%) had low to medium communication exposure, which was an indication of low level of communication facilities in this community regarding fish farming information.

Yeasmin (2013) conducted a study on training needs of the integrated fish farmers on integrated fish farming and revealed that 67.8% of the integrated fish farmers had medium communication exposure compared with 17.8% having high communication exposure and 14.4% having low exposure. Similar results were found by Ferdousi (2010), Hossain (2007), Yesmin (2007) and Alam (2004).

Bachhav (2012) carried the study on farmers' information needs in India found that the major sources of information were colleague farmers, Newspapers and government offices.

Akhter (2011) found that the frequently used information sources were commercial fish farmers (2.22%) and neighbors and friends (2.18%). The occasionally used sources were Sub-Assistant Agriculture Officer (1.85%), NGO workers (1.25%), fish feed traders (1.92%), other input traders (1.57%), group discussion meeting (1.07%). The rarely used sources were Upazila Fisheries Officer (0.95%), Local Extension Agent of Fisheries (LEAF), Field Assistant (FA), demonstration meeting, participating in fisheries related training programme, watching agricultural programme in television, reading daily newspapers, watching posters and leaflets/booklets. It was found that 56.67% of the respondents had low use of information sources, while 36.67% had medium use of information sources and only 6.67% of the fish farmers had medium-high use of information sources in receiving information on small scale pond fish culture.

Another studies by Bozi and Ozcatalbas (2010) in Turkey found that, family members, neighbor farmer, extension services, input providers and mass media were the main source of information used by farmers to access agricultural information.

Hossain (2010) found that use of communication media in practicing Rice-cum-fish culture of the respondents ranged from 4 to 25 against the possible score of 0 to 60, the average being 9.40. Among the respondents 91.11% had low use and 8.89% had medium use of communication media on Rice-cum-fish culture.

The study by Okunade (2007) found that the key sources of information used by farmer in accessing agricultural information were result demonstration, general meetings, group discussion, lectures, television, radio, cinema, leaflets, bulletins, letters, and circulars.

2.2 Relationships between Selected Characteristics of the Respondents and their Use of Communication Media

2.2.1 Age and use of communication media

Sharmin (2013) in his study found that age of the commercial fish farmers had significant negative relationship with their extent of use of communication media.

Akhter (2011) reported that a significant relationship existed between age of the farmers and their extent of use of information sources on small scale pond-fish culture. Young and middle age people are generally more respective to new ideas and practices. They are usually influential partner in making decision regarding farming affairs.

Hossain (2010) found that age of the farmers had a significant negative relationship between their extent of use of communication media. He observed that most (83.4%) of the farmers belonged to young to middle age categories.

Similar finding was found by Bhuiyan (1988), Alam (2004), Karim (2005), Islam (2009), Das (2009) in their respective studies.

2.2.2 Level of education and use of communication media

Sharmin (2013) concluded that education of the fish farmers had significant positive relationship with their extent of use of communication media.

Akhter (2011) revealed that education of the pond fish farmers had significant positive correlation with their extent of use of information sources. Similar findings were also observed by Kashem and Jones (1988), Khan (1996), Saha (2003), Anisuzzaman (2003), Islam (2004), Alam (2004), Karim (2005), Islam (2009), Das (2009) and Hossain (2010) in their respective studies.

2.2.3 Fish cultivation area and use of communication media

Sharmin (2013) found that size of the fish farm of the fish farmers had no significant relationship with their extent of use of communication media.

Akhter (2011) revealed that farm size of the pond fish farmers had a significant and positive relationship with their extent of use of information sources. Similar findings were also observed by Bhuiyan (1988), Sarkar (2005), Islam (2009), and Hossain (2010) in their respective studies.

2.2.4 Annual income from fish culture and use of the communication media

Sharmin (2013) observed that annual family income of the fish farmers had positive significant relationship with their extent of use of communication media.

Akhter (2011) revealed that there was a strong and highly significant positive relationship between the fish farmer's income from pond fish farmers and their extent of use of information sources. Similar findings were also observed by Uddin (1993), Islam (1998), Sarkar (2005), Das (2009), and Hossain (2010) in their respective studies.

2.2.5 Organizational participation and use of communication media

Sharmin (2013) found that organizational participation of the fish farmers had no significant relationship with their extent of use of communication media.

Hossain (2010) in his study concluded that Organizational participation of the farmers had a significant and positive relationship with their extent of use of communication media. Similar findings were also observed by Islam (1995), Anisuzzaman (2003), Nuruzzaman (2003), and Karim (2005) in their respective studies.

2.2.6 Innovativeness and use of communication media

Hossain (2008) Found that innovativeness of the literate farmers had positive and highly significant relationship with their use of printed materials in receiving farm information.

Hossain (2006) found that there is a positive and significant relationship between innovativeness of the farmers and their use of communication media, which implies that with the increase of innovativeness the use of communication media is also increased.

2.2.7 Fish farming knowledge and use of communication media

Sharmin (2013) found that knowledge on commercial fish culture of the fish farmers had positive significant relationship with their extent of use of communication media.

Hossain (2010) in his study concluded that there was a significant and positive relationship between knowledge on Rice-Cum-Fish culture and their extent of use of communication media by the farmers. Similar findings were also observed by Kashem and Jones (1988), Kashem and Halim (1991), Anisuzzaman (2003), Alam (2004), Karim (2005), Islam (2009), and Akhter (2011) in their respective studies.

2.2.8 Fish farming experience and use of communication media

Sharmin (2013) found that fish culture experience of the fish farmers had no significant relationship with their extent of use of communication media.

Akter (2013) reveals that fish culture experience of the fishermen had significant positive relationship with their awareness on fish sanctuary.

Akhter (2011) reported that there was no significant relationship between fish culture experience of the pond fish farmers and their extent of use of information sources.

2.2.9 Fish farming facilities and use of communication media

Uddin (2007) found that farming facilities of the farmers no significant relationship with their use of communication media.

2.2.10 Problem faced in fish farming and use of communication media

Hossain (2013) found that there was no relationship between extension media contact and problems faced by the fish farmers in aquaculture management practices.

Akter (2009) revealed that extension media contact of the rural women had no relationship with their barrier in participating aquaculture activities.

2.3 The Conceptual Framework of the Study

In scientific research, selection and measurement of variables constitute an important task. Use of communication media by the farmers in receiving information regarding fish farming was the main focus of this study. It might be influenced by various characteristics of the farmers including age, level of education, capital for fish farming, fish cultivation area, annual income from fish culture, organizational participation, innovativeness regarding fish farming, fish farming knowledge, fish farming experience, fish farming facilities and problem faced in fish farming. Based on above issue and the review of literature, the conceptual framework of this study has been formulated and shown in Figure 2.1.

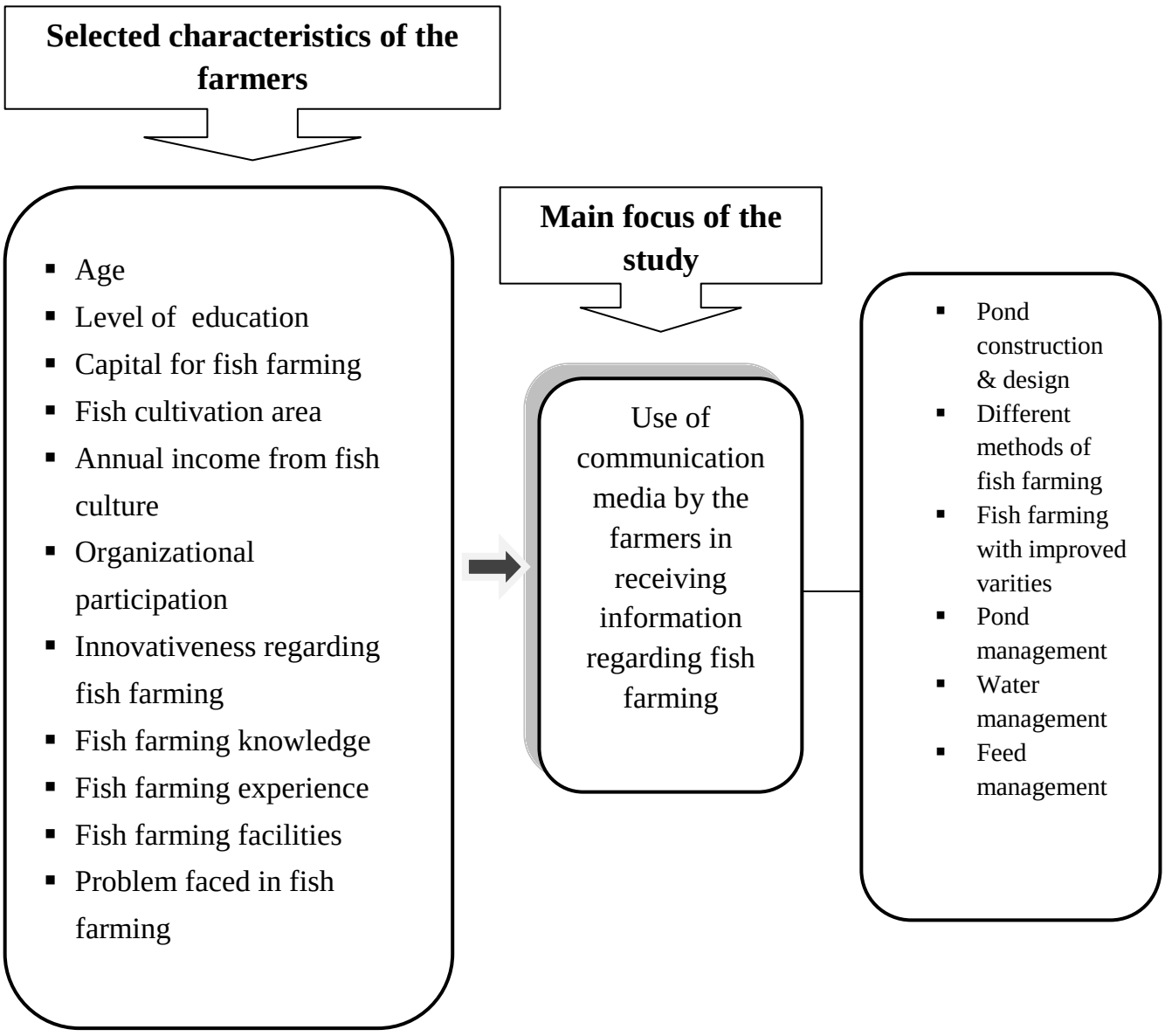

Figure 2.1 Conceptual framework of the study

CHAPTER 3

METHODOLOGY

3.1 The Locale of the Study

The study was conducted at Jugli union under Haluaghat upazila of Mymensingh district. Out of 17 villages of Jugli union 4 villages namely Jugli, Khalishakuri, Nayapara and Satugaon were purposively selected for the study. Maps of Mumensingh district and Haluaghat upazila showing the study area are presented in figure 3.1 and figure 3.2 respectively.

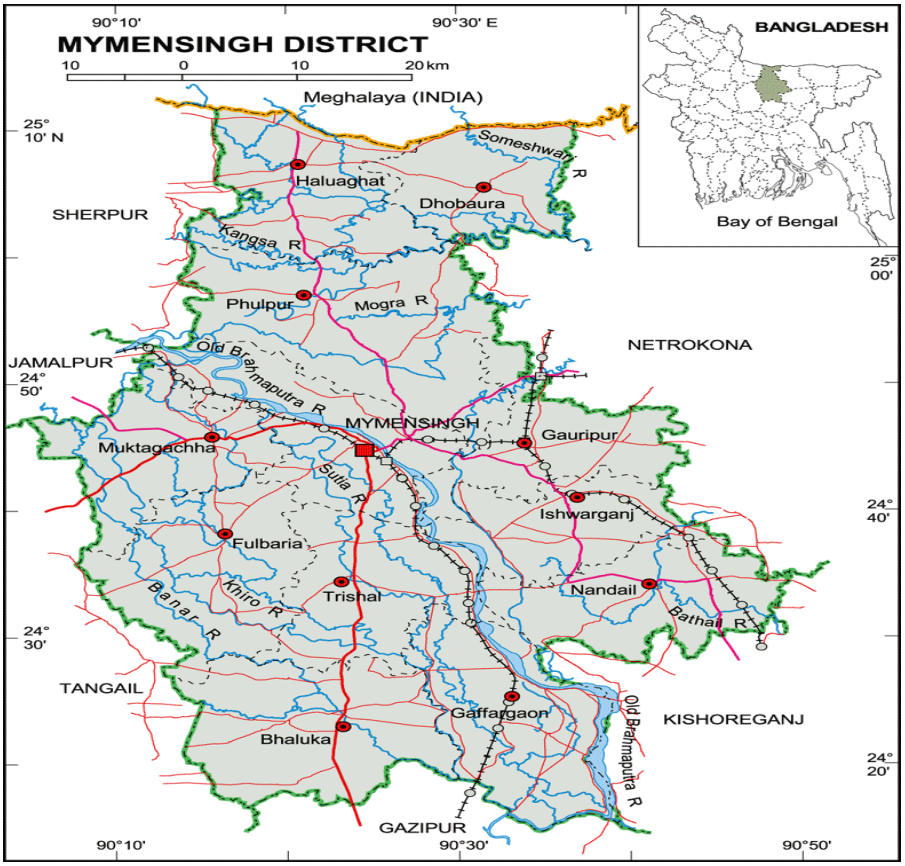

Figure 3.1 Map of Mymensingh district showing the Haluaghat upazila

Figure 3.2 Map of Haluaghat upazila showing the study area of Jugli union

3.2 Population and Sampling of the Study

The fish farmers of selected four villages under Jugli union of Haluaghat upazilla of Mymensingh district were considered as the population of the study. A list of fish farmers who are currently growing fish and fish fry in their pond was prepared with the help of Upazilla Fisheries Officer and his field staffs. The number of fish farmers of the selected four villages were 223 which constituted the population of the study.

Fifty percent of the population was selected proportionally from the selected villages as the sample by following proportionate random sampling method.

Thus, the total sample size stood at 112. Moreover, a reserved list of 12 fish farmers was prepared by taking 3 from each village for use when the fish farmers under original sample were not available during data collection.

The distribution of the population, sample fish farmers with reserve list of the selected villages is shown in the Table 3.1.

Table 3.1 Distribution of the sample of fish farmers in the study area

Name of village	Population (Total no. of fish farmers)	Sample size	Reserve list size
Jugli	73	37	3
Khalishakuri	53	27	3
Nayapara	51	25	3
Satugaon	46	23	3
Total	223	112	12

3.3 Instrument for Data Collection

A previously structured interview schedule was used as data gathering instrument by keeping in view the objectives of the study. Both open and closed form questions were included in the interview schedule.

Before finalization, the interview schedule was pre-tested with 15 fish farmers of the study area excluded from the sample. On the basis of the pre-test experiences necessary corrections, modifications and alterations were made before finalizing the interview schedule for final data collection. During modification of the schedule, valuable suggestions were received from the research supervisors and relevant experts. The interview schedule was then printed in its final form and multiplied. A copy of interview schedule in english version has been furnished in appendix -A.

3.4 Data Collection

Data were collected by the researcher himself from the selected fish farmers. The interviews were conducted with the respondents individually in their respective houses. The researcher took all possible care to establish rapport with the respondents so that they would not feel any trouble while starting the interview. If the respondents felt any difficulty in understanding any question, the researcher took utmost care to explain and clarify the same properly. The

researcher in collecting data faced no serious difficulty. Data were collected during the period from 05 to 25 September, 2015.

3.5 Measurement of Variables

The characteristics of the fish farmers i.e. age, level of education, capital for fish farming, fish cultivation area, annual income from fish culture, organizational participation, innovativeness regarding fish farming, fish farming knowledge, fish farming experience, fish farming facilities, problem faced in fish farming were considered for the study as the causal variables. Use of communication media by the fish farmers was the main focus of the study which was considered as the predicted variable.

3.5.1 Measurement of the Causal Variables

The selected characteristics of the fish farmers were the causal variables of the study. To keep the study manageable, 11 causal variables were selected. The procedures of measurement of the selected variables were as follows:

3.5.1.1 Age

The age of a respondent was measured in terms of actual years from his/her birth to the time of interview on the basis of his/her response. A score of one (1) was assigned for each year of age.

3.5.1.2 Level of education

Education was measured as the ability of the respondent to read and write or the formal education received up to a certain standard. A score of one (1) was given for each year of formal schooling completed by the respondent, a score of zero (0) was given to a respondent who could not read and write, a score of 0.5 was given to the respondent who could sign only and. This variable appears in the question no. 2 of the interview schedule as presented in (appendix–A).

3.5.1.3 Capital for fish farming

Capital for fish farming was measured in thousand taka. A score of one (1) was assigned for each of “000” taka investment for measuring the capital for fish farming.

3.5.1.4 Fish cultivation area

Fish cultivation area of the respondent was measured as the size of his/her fish farm on which he/she continued his fish farming during the period of study. Each respondent was asked to mention the actual area of their own pond and pond taken from others on lease.

Fish cultivation area of a respondent was calculated in hectare. This variable appears in the question no. 4 in the interview schedule as presented in appendix–A.

3.5.1.5 Annual income from fish culture

Annual income from fish culture was measured in thousand taka. It refers to the earnings of the respondent from selling of fish and fish fry. A score of one (1) was assigned for each of "000" taka for measuring the annual income of a respondent from fish culture.

3.5.1.6 Organizational participation

Organizational participation score of a respondent was measured on the basis of his membership with different types of organization. Organizational participation was computed in the following manner of participation in each organization.

Organizational participation score = $O_{om}\times1 + O_{em}\times2 + O_{eo}\times3$

Where,

O_{om} = total duration (year) of participation as ordinary member

O_{em} = total duration (year) of participation as executive member

O_{eo} = total duration (year) of participation as executive officer

Participation score (p) was determined as per following way:

Nature of Participation	Score Assigned
No participation	0
Participation as ordinary member for one year	1
Participation as executive member for one year	2
Participation as executive officer for one year	3

Finally, the organizational participation score was computed by summing the scores from all the organization.

3.5.1.7 Innovativeness regarding fish farming

Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in a social system (Rogers, 1983). Innovativeness of the respondent was measured on the basis of their adoption of seven new technologies related to fish farming. Five (5) point scales was used for computing the innovativeness score as follows:

Duration of time in years	Score
Adoption of technologies within one year after hearing	4
Adoption of technologies within (>1 to 2) years after hearing	3
Adoption of technologies within (>2 to 3) years after hearing	2
Adoption of technologies after 3 years of hearing	1
Never used	0

Finally the innovativeness score of the fish farmers were computed by adding the scores obtain from all the seven items of innovativeness. Thus the innovativeness score of the respondents could range from 0 to 28, while "0" indicating no innovativeness and "28" indicating highest innovativeness regarding fish farming.

3.5.1.8 Fish farming knowledge

Knowledge on fish farming of a respondent was measured by asking a series of questions. The question was related to general aspects of fish farming and it was open. It contained ten questions about general aspect of fish farming. Thus, scores obtained of all the questions were summed up to get total knowledge score of a respondent. Two (2) score was assigned for each correct answer and zero (0) for wrong or no answer. Partial score was also assigned for partially

correct answer. The possible score of a respondent could be 0 to 20, where 0 indicated very low and 20 indicated very high knowledge on fish farming.

3.5.1.9 Fish farming experience

Fish farming experience was measured by the total years of experience of the respondents in fish culture. One (1) score was assigned for 1 year of experience in fish farming.

3.5.1.10 Fish farming facilities

Fish farming facilities refers to the possession of fish farming implements, inputs and other necessary accessories required for performing various fish farming operation by the respondents. It was measured by 5 point scale such as abundant, adequate, moderate, least and not at all. Weights were assigned to each of the alternative responses as 0 for "not at all", 1 for "least", 2 for "moderate", 3 for "adequate" and 4 for "abundant". Nine items were considered for computing fish farming facilities. So, the possible score for fish farming facilities could range from 0 to 36, while "0" indicates no facilities and "36" indicates highest facilities.

3.5.1.11 Problem faced in fish farming

Problem faced in fish farming was measured through a 5-point rating scale. Ten problems on various aspects of fish farming practices were selected to measure the extent of problem faced by the fish farmers. There were five options to response a problem, namely "high", "medium", "low", "very low" and "not at all" with a corresponding score of 4, 3, 2, 1 and 0 respectively. A respondent was asked to indicate his/her extent of problems by selecting the appropriate option. The problem score of a respondent was computed by summing the scores for his/her responses to all the problems. Hence, scores of a respondent could range from 0 to 40 where '0' indicating no problem and '40' indicating very high problem.

3.5.2 Measurement of predicted variable

Use of communication media by the farmers in receiving information regarding fish farming was the main focus and predicted variable of the study. Nine (9) communication media of different nature were selected to measure the extent of use of communication media by the fish farmers in receiving information regarding 6 dimensions of fish farming. Extent of use of communication media was determined by using a 4-point rating scale such as frequently, occasionally, rarely and not at all and the respective weights were assigned as 3, 2, 1 and 0. Logical frequencies of contact was assigned for each alternative responses.

Thus the extent of use of communication media score of a respondent for particular fish farming practices could range from 0 to 27 for each dimension. Finally score of communication media was determined by summing the score of all the 6 dimensions. Thus the score of use of communication media by the farmers in receiving information regarding fish farming was ranged from 0 to 162, while "0" indicating no use of communication media and "162" indicating highest use of communication media.

3.5.3 Comparative use of communication media

In order to identify the important communication media, a Communication Media Use Index (CMUI) was computed. It was calculated by multiplying the frequency counts of each cell of scale of individual communication media with its corresponding weights such as 3 for 'frequency', 2 for 'occasionally', 1 for 'rarely' and o for 'not at all'. The Communication Media Use Index (CMUI) was calculated by the following formula for particular medium:

Communication Media Use Index (CMUI) = $CM_F \times 3 + CM_O \times 2 + CM_R \times 1 + CM_N \times 0$

Where,

CM_F = Number of respondents with 'frequently use'

CM_O = Number of respondents with 'occasionally use

CM_R = Number of respondents with 'rarely use'

CM_N = Number of respondents with 'not at all use'

Thus, CMUI of a particular medium for single dimension could range from 0 to 336, where “0” is indicating no use of communication media and “336” indicating highest level of extent of use of communication media. However, the communication media use index of a medium for six dimensions could range from “0” to “2016”.

3.6 Categorization

For describing the various variables, the respondents were classified into several categories in respect of each variable. These categories were developed by considering the nature of distribution of data and general understanding prevailing in the social system. The procedure for categorization of data in respect of different variables are elaborately discussed while describing those variables in Chapter 4.

3.7 Methods of Data Analysis

The collected data were compiled, tabulated, coded and analyzed in accordance with the objectives of the study. The statistical measures such as number and percentage distribution, range, mean, standard deviation and rank order were used for describing the variables of the study. To find out the relationships between the selected characteristics of the fish farmers and their use of communication media in receiving information regarding fish farming, Pearson's Product Moment Correlation coefficient (r) was computed. Correlation matrix was also computed to determine the inter-relationships among all the variables. If the computed value of co-efficient of correlation 'r' was equal to or greater than the table value of co-efficient at designated level of significance for the relevant degree of freedom, the null hypothesis was rejected and it was concluded that there was significant relationship between the concerned variables. However, when the computed value of co-efficient of correlation was found to be smaller than the tabulated value at the designated level of significance for the relevant degree of freedom, it was concluded that the nun hypothesis could not be rejected and hence there was no relationship between the concerned variables.

3.8 Hypothesis of the Study

In order to guide the objectives of the study, the following hypotheses were formulated:

Research Hypothesis: There exists relationship between each of the selected characteristics of the fish farmers and their use of communication media in receiving information regarding fish farming.

Null Hypothesis: There exists no relationship between each of the selected characteristics of the fish farmers and their use of communication media in receiving information regarding fish farming.

CHAPTER 4

RESULTS AND DISCUSSION

In this Chapter, the findings are presented in four sections in accordance with the objectives of the study. The first section deals with the selected characteristics of the farmers. The second section has dealt with the use of communication media by the farmers in receiving information regarding fish farming, the third section deals with the comparative use of communication media and the last section has dealt with relationships between the selected characteristics of the farmers and their extent of use of communication media.

4.1 Characteristics of the Fish Farmers

The findings relating to the selected characteristics of the farmers namely; age, level of education, capital for fish farming, fish cultivation area, annual income from fish culture, organization participation, innovativeness regarding fish farming, fish farming knowledge, fish farming experience, fish farming facilities and problem faced in fish farming are presented Table 4.1 and discussed afterwards:

Table 4.1 Salient features of the respondents with their characteristics

Characteristics	Measuring unit	Range		Mean	SD
		Possible	Observed		
Age	Years	Unknown	18-65	41.37	9.98
Level of education	Year of schooling	Unknown	0-17	8.32	4.21
Capital for fish farming	'000' taka	Unknown	20-2500	429.84	471.78
Fish cultivation area	Hectare	Unknown	0.08- 4.80	0.88	0.68
Annual income from fish culture	'000' taka	Unknown	18-2500	456.28	484.58
Organizational participation	Scores	Unknown	0-60	13.54	11.70
Innovativeness regarding fish farming	Scores	0-28	1-24	9.69	5.51
Fish farming knowledge	Scores	0-20	11-20	15.86	1.84
Fish farming experience	Years	Unknown	1-30	8.84	5.24
Fish farming facilities	Scores	0-36	14-28	19.52	2.30
Problem faced in fish farming	Scores	0-40	19-38	33.35	2.92

4.1.1 Age

The age of the sample farmers ranged from 18 to 65 years with an average of 41.37 and standard deviation of 9.98. The respondents were classified into three categories on the basis of their age (Table 4.2).

Table 4.2 Distribution of the fish farmers according to their age

Categories	Respondents	
	Number	Percent (%)
Young aged (up to 35)	37	33.04
Middle aged (36-50)	48	42.86
Old aged(> 50)	27	24.10
Total	112	100

Data indicate that the highest proportion (42.86 %) of the fish farmers were middle aged while the lowest proportion (24.10%) of the respondents were in the category of old aged. It was clearly observed that 75.90 % of the respondentswere young to middle aged. Dhali (2013), Sharmin (2013), Akter (2011) and Hossain (2010) also found that most of the respondents were young to middle agedin their respective studies.

4.1.2 Level of Education

Education of the respondents was measured by following the procedure as discussed earlier in Chapter 3. The education ranged from 0-17, with an average of 8.32 and standard deviation of 4.21. Based on their level of education, the fish farmers grouped in to five categories and the distribution of the respondents according to their education is presented in table 4.3.

Table 4.3 Distribution of the fish farmers according to their education

Categories	Respondents	
	Number	Percent (%)
Can't read &write (0)	5	4.47
Can sign only (0.5)	8	7.14
Primary education (1-5)	16	14.29
Secondary education (6-10)	57	50.89
Above secondary education(>10)	26	23.21
Total	112	100

It is evident from the Table 4.3 that most(50.89%) of the respondents received secondary education while 14.29% and 23.21 % respondents received primary and above secondary education respectively. On the other hand, 4.47% of the respondents did not receive any formal education and fall in the category can't read and write. Only 7.14% of the respondents were belonged to the category of can sign only.

4.1.3 Capital for fish farming

Capital for fish farming scores of the fish farmers ranged from taka 20 thousand to 2500 thousand, the mean being 429.84 thousand and standard deviation 471.78. On the basis of their capital for fish farming scores, the fish farmers were divided into following three categories:

Categories	**Basis of categorization (score)**
Low capital	< 195 (Mean – 0.5 sd)
Medium capital	195-665 (Mean ± 0.5 sd)
High capital	> 665 (Mean + 0.5 sd)

The distribution of the fish farmers according to their capital for fish farming is shown in Table 4.4.

Table 4.4 Distribution of the fish farmers according to their capital for fish farming

Categories	Respondents	
	Number	Percent (%)
Low	39	34.82
Medium	53	47.32
High	20	17.86
Total	112	100

Data presented in the Table 4.4 shows that the highest proportion (47.32%) of the farmers had medium capital where as 17.87% had high capital and 34.82% had low capital for fish farming. This table indicates that most of the respondents (82.14%) had low to medium capital.

4.1.4 Fish cultivation area

The study found that, fish farming area was varied from 0.08 to 4.80 hectares. The average farm size was 0.88 hectares with a standard deviation of 0.68. The respondents were classified into three categories based on their farm size as "small farm", "medium farm" and "large farm". The distribution of the respondents according to their fish cultivation area is shown in Table 4.5.

Table 4.5 Distribution of the fish farmers according to their fish cultivation area

Categories	Respondents	
	Number	Percent (%)
Small (up to 1 ha)	73	65.18
Medium (>1 to 3 ha)	38	33.93
Large (> 3 ha)	1	0.89
Total	112	100

Data presented in the Table 4.5 shows that the highest proportion (65.18%) of the farmers had small fish cultivation area where as 33.93% had medium fish cultivation area and 0.89% had large fish cultivation area. Table 4.5 shows that

almost all (99.11%)the farmers had small to medium size fish cultivation area. Sharmin (2013), Akhter (2011) and Islam (2009) also mentioned that most of the respondents had small to medium cultivation area in their respective studies.

4.1.5 Annual income from fish culture

Annual income from fish culture scores of the fish farmers ranged from taka 18 thousand to 2500 thousand, the mean being 456.28 and standard deviation 484.58 thousand. On the basis of their annual income scores, the fish farmers were divided into following three categories:

Categories	**Basis of categorization (score)**
Low income	< 215 (Mean – 0.5 sd)
Medium income	215-700 (Mean ± 0.5 sd)
High income	> 700 (Mean + 0.5 sd)

The distribution of the pond owners according to their annual family income is shown in Table 4.6.

Table 4.6 Distribution of the fish farmers according to their annual income from fish culture

Categories	Respondents	
	Number	Percent (%)
Low	41	36.61
Medium	52	46.43
High	19	16.96
Total	112	100

About 46.43% of the fish farmers had medium annual income while 36.61% of them having low annual income and 16.96% high annual income from fish culture. Table 4.6 shows that overwhelming majority (83.04%) of the fish farmers had low to medium annual income from fish farming.

4.1.6 Organizational participation

Organizational participation score of the fish farmers varied from 0 to 60 with an average of 13.54 and standard deviation of 11.70. On the basis of organizational participation respondent were divided into following four categories:

Categories	**Basis of categorization (score)**
No participation	0
Low participation	1-7 (Mean – 0.5 sd)
Medium participation	8-19 (Mean ± 0.5 sd)
High participation	> 19 (Mean + 0.5 sd)

The distribution of the fish farmers according to their organizational participation is shown in Table 4.7.

Table 4.7 Distribution of the fish farmers according to their Organizational participation

Categories	Respondents	
	Number	Percent (%)
No participation	8	7.14
Low participation	38	33.93
Medium participation	36	32.14
High participation	30	26.79
Total	112	100

Data presented in the Table 4.7 shows that 33.93 % farmers had low organizational participation, 32.14 % had medium organizational participation and 26.79 % had high organizational participation and 7.14% had no organizational participation.

4.1.7 Innovativeness regarding fish farming

Innovativeness score of the respondents ranged from 1 to 24, against the possible scores 0 to 28, with an average of 9.69 and standard deviation of 5.51. On the basis of innovativeness respondent were divided into following three categories:

Categories	**Basis of categorization (score)**
Low innovativeness	<7 (Mean – 0.5 sd)
Medium innovativeness	7-12 (Mean ± 0.5 sd)
High innovativeness	> 12 (Mean + 0.5 sd)

The distribution of the respondents according to their innovativeness has been presented in Table 4.8.

Table 4.8 Distribution of the fish farmers according to their innovativeness regarding fish farming

Categories	Respondents	
	Number	Percent (%)
Low innovativeness	35	31.25
Medium innovativeness	49	43.75
High innovativeness	28	25.00
Total	112	100

Data in Table 4.8 indicate that highest proportion (43.75 %) of the respondents had medium innovativeness, while 31.25% had low innovativeness and 25% had high innovativeness. Hossain (2006) also found that most of the respondents had medium innovativeness in his study.

4.1.8 Fish farming knowledge

Fish farming knowledge score of the fish farmers ranged from 11 to 20 against the possible range from 0 to 20. The average score was 15.86 and standard

deviation was 1.84. On the basis of knowledge respondents were divided into following three categories:

Categories	**Basis of categorization (score)**
Low knowledge	<14 (Mean – 0.5 sd)
Medium knowledge	14-16 (Mean ± 0.5 sd)
High knowledge	> 16 (Mean + 0.5 sd)

Based on knowledge score, the fish farmers were classified into three categories as were shown in Table 4.9.

Table 4.9 Distribution of the fish farmers according to their fish farming knowledge

Categories	Respondents	
	Number	Percent (%)
Low knowledge	12	10.71
Medium knowledge	53	47.32
High knowledge	47	41.97
Total	112	100

Majority of the respondents 47.32 % had medium knowledge, while 41.97 % had high and 10.71 % had low fish farming knowledge.

4.1.9 Fish farming experience

Fish culture experience of the respondents ranged from 1 to 30 years. The average and standard deviation were 8.84 years and 5.24 respectively. Based on the scores, the respondents were classified into three categories and shown in Table 4.10.

Categories	**Basis of categorization (score)**
Short–term	<6 (Mean – 0.5 sd)
Mid–term	6-12 (Mean ± 0.5 sd)
Long–term	> 12 (Mean + 0.5 sd)

Table 4.10 Distribution of the fish farmers according to their fish farming experience

Categories	Respondents	
	Number	Percent (%)
Short -term	37	33.04
Mid- term	44	39.29
Long- term	31	27.67
Total	112	100

The highest proportion (39.29%) of the fish farmers had mid-term experience while the lowest proportion (27.64%) of the respondents had long-term experience.

4.1.10 Fish farming facilities

Fish farming facilities scores of the respondents ranged from 14 to 28 years. The average and standard deviation were 19.52 years and 2.30 respectively. Based on the scores, the respondents were divided into following three categories:

Categories	**Basis of categorization (score)**
Low	<18 (Mean – 0.5 sd)
Medium	18-20 (Mean ± 0.5 sd)
High	> 20 (Mean + 0.5 sd)

The distribution of the fish farmers according to their fish farming facilities is shown in Table 4.11.

Table 4.11 Distribution of the fish farmers according to their fish farming facilities

Categories	Respondents	
	Number	Percent (%)
Low	19	16.96
Medium	59	52.68
High	34	30.36
Total	112	100

The highest proportion (52.68%) of the fish farmers had medium fish farming facilities compared to 30.36% high and 16.96% low fish farming facilities. This table indicates that most (83.04%) of the respondents had medium to high fish farming facilities.

4.1.11 Problem faced in fish farming

The problem faced in fish farming score of the fish farmers ranged from 19 to 38 with a mean of 33.35 and standard deviation of 2.92. Based on the scores, the respondents were classified into following three categories:

Categories	**Basis of categorization (score)**
Low	<31 (Mean – 0.5 sd)
Medium	31-34 (Mean ± 0.5 sd)
High	> 34 (Mean + 0.5 sd)

The distribution of the fish farmers according to their problem faced is presented in Table 4.12.

Table 4.12 Distribution of the fish farmers according to their Problem faced in fish farming

Categories	Respondents	
	Number	Percent (%)
Low	16	14.29
Medium	54	48.21
High	42	37.50
Total	112	100

Data presented in the table shows that the highest proportion (48.21%) of the respondents fall in the category of medium problem faced while the lowest proportion (14.29%) of the respondents fall in the category of low problem faced and 37.50% of the respondents faced high problem during fish farming.

4.2 Fish Farmers Use of Communication Media

Use of communication media by the fish farmers was the main focus of the study. In this study nine (9) communication media of different nature were selected for six (6) different fish farming practices. Thus the possible range of scores of the individual farmer for particular fish farming practice ranged from 0 to 27 and for six fish farming practices it was from 0 to 162.

The combined calculated communication media score of the fish farmers ranged from 12 to 78 against the possible range of 0 to 162 with an average score of 37.75 and standard deviation 12.78. Based on the scores, the respondents were classified into following three categories:

Categories	**Basis of categorization (score)**
Low communication media use	<31 (Mean – 0.5 sd)
Medium communication media use	31-44 (Mean ± 0.5 sd)
High communication media use	> 44 (Mean + 0.5 sd)

The distribution of the fish farmers according to the communication media score has been shown in Table 4.2. Data presented in Table 4.2 reveals that,

36.61% of the fish farmers were low user of communication media, 33.93% medium user of communication media and 29.46% high user of communication media.

Table 4.13 Distribution of the fish farmers according to their communication media use

Categories	Respondents	
	Number	Percent (%)
Low communication media use	41	36.61
Medium communication media use	38	33.93
High communication media use	33	29.46
Total	112	100

Most of the farmers are not aware of using communication media. They think fish farming is a natural process and they are not aware of using modern technologies. Most of them follow the traditional fish culture method.

Similar categories were found by the Hossain (2010). Hossain (2010) conducted a study on extent of use of communication media by the farmers on Rice-Cum-Fish culture and found that 91.11% of the respondents had low use of communication media and 8.89% had medium use of available communication media in practicing Rice-Cum-Fish culture.

4.3 Comparative use of communication media

Communication media score for each communication media was calculated by using the Communication Media Use Index (CMUI).Table 4.14 shows communication media used by the farmers in receiving information on six different fish farming practices and table 4.15 shows rank order of the Communication media used by the farmers in receiving information on all fish farming practices. In both cases fish farmers were used as the communication

media to the highest extent and then input dealer, television, fisheries officer & group discussion/group meeting. Listening radio and reading leaflet / bulletin / magazines were used as the communication media to the lowest extent. This is because most of the people are not educated and the price of television is within the reach of general people.

Table 4.14 Communication media used by the farmers in receiving information on six different fish farming practices

Sl no	Communication Media	Pond construction		Different methods of fish farming		Fish farming with improved varieties		Pond management		Water management		Feed management	
		Score (CMUI)	Rank order	Score (CMUI)	Rank order	Score (CMUI)	Rank order	Score (CMUI)	Rank order	Score (CMUI)	Rank order	Score (CMUI)	Rank order
1	Model/ Neighbor fish farmers	295	1	297	1	297	1	297	1	297	1	292	1
2	Upazila Fisheries officers	66	4	66	4	65	4	65	4	64	4	63	4
3	Input dealers	149	2	147	2	148	2	202	2	152	2	177	2
4	Group discussion	42	5	39	5	41	5	42	5	42	5	39	5
5	Demonstration	9	6	9	6	9	6	9	6	9	6	9	6
6	Participation in fair	5	7	5	7	5	7	5	7	5	7	5	7
7	Watching tv	127	3	119	3	119	3	119	3	119	3	119	3
8	Listening radio	2	9	2	9	2	9	2	9	2	9	2	9
9	Reading leaflet, bulletin etc.	4	8	4	8	4	8	4	8	4	8	4	8

Table 4.15 Rank order of the Communication media used by the farmers in receiving information on all fish farming practices

SlNo.	Communication Media	Communication Media Use Index (CMUI)	Rank order
1	Model/Neighbor fish farmer	1775	1
2	Upazila Fisheries officer	389	4
3	Input dealer	975	2
4	Group discussion or group meeting	249	5
5	Demonstration meeting or field day	52	6
6	Participation in fish farmers rally/ fairs / other extension event	30	7
7	Watching agricultural programs on tv	722	3
8	Listening agricultural programs on radio	12	9
9	Reading leaflet / bulletin / magazines etc.	24	8

4.4 Relationships between the Selected Characteristics of the Fish Farmers and their Use of Communication Media

Pearson's Product Moment Correlation Co-efficient (r) was computed in order to find out the relationship between the selected characteristics of the fish farmers and their extent of use of communication media in receiving information regarding fish farming. To reject or accept the null hypothesis, 5% level of probability was used.

Results of correlation have been shown in Table 4.16. Correlation co-efficient among all the variables might be seen in the correlation matrix in appendix-B.

Table 4.16 Relationships between the Selected Characteristics of the Fish Farmers and their Use of Communication Media

Main focus of the study	Selected characteristics of the fish farmers	Computed value of co-efficient of correlation 'r'
Use of communication media by the fish farmers in receiving information regarding fish farming	Age	.050^{NS}
	Education	.176^{NS}
	Capital for fish farming	.306**
	Fish cultivation area	.338**
	Annual income from fish culture	.405**
	Organizational participation	.273**
	Innovativeness regarding fish farming	.507**
	Fish farming knowledge	.255**
	Fish farming experience	.120^{NS}
	Fish farming facilities	.169^{NS}
	Problem faced in fish farming	.102^{NS}

****** Significant at the 0.01 level***** Significant at the 0.05 level ^{NS} Not significant

4.4.1 Relationship between age and use of communication media

The coefficient of correlation between age of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient of correlation (r) between the concerned variable was found .050. Based on findings, null hypothesis could not be rejected i.e. this meant that age of the fish farmers had no significant relationship with their use of communication media in receiving information regarding fish farming. Similar findings were found by Ahmad (2008), Anisuzzaman (2003), Islam (2004), Sarkar (2005) in their respective studies. But Sharmin (2013), Akhter (2011)&Hossain (2010) found that age of the farmers had a significant negative relationship between their extents of use of communication media.

4.4.2 Relationship between education and use of communication media

The coefficient of correlation between education of the fish farmers and their use of communication media was presented in Table 4.16.The coefficient (r) of correlation between the concerned variable was found 0.176. Based on findings, null hypothesis could not be rejected i.e. this meant that education of the fish farmers had no significant relationship with their use of communication media in receiving information regarding fish farming. Similar findings were found by Sarkar (2005)&Khaton (2004). But,Sharmin (2013)&Akhter (2011) concluded that education of the fish farmers had significant positive relationship with their extent of use of communication media.

4.4.3 Relationship between capital for fish farming and use of communication media

The coefficient of correlation between capital of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient of correlation (r) between the concerned variable was found 0.306. On the basis of findings, null hypothesis was rejected. Hence, capital of the fish farmers had positive significant relationship with their use of communication media in receiving information regarding fish farming. This is because the respondents who invest more capital in fish farming use more communication media for seeking information about fish culture.

4.4.4 Relationship between fish cultivation area and use of communication media

The coefficient of correlation between fish cultivation area of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient (r) of correlation between the concerned variable was found 0.338. On the basis of findings, null hypothesis was rejected. Hence, fish cultivation area of the fish farmers had positive significant relationship with their use of communication media in receiving information regarding fish farming. This is because farmers who have large fish farming area always use different communication media for maximum utilization of their land. Similar findings

were found by Akhter (2011), Hossain (2010) & Islam (2009)in their respective studies. But Sharmin (2013) observed no significant relationship with fish cultivation area and use of communication media by the fish farmers.

4.4.5 Relationship between annual income from fish culture and use of communication media

The coefficient of correlation between annual income of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient of correlation (r) between the concerned variables was found 0.405. Based on the findings, null hypothesis was rejected. Hence, it can be said that annual income of the fish farmers had positive significant relationship with their use of communication media in receiving information regarding fish farming. If annual income of the fish farmers increases then their use of communication media also increases. High annual income makes strong economic base for fish farmers'. So, they use more communication media. Similar findings were also found by Sharmin (2013)&Akhter (2011). But Anisuzzaman (2003), Nuruzzaman (2003) and Alam (2004) found no significant relationship with annual income and use of communication media by the farmers.

4.4.6 Relationship between organizational participation and use of communication media

The coefficient of correlation between organizational participation of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient (r) of correlation between the concerned variables was found 0.273. Based on the findings, null hypothesis was rejected. Hence, organizational participation of the fish farmers had positive significant relationship with their use of communication media in receiving information regarding fish farming. This is because high organizational participation influences respondents to use more communication media for seeking information regarding fish farming. Hossain (2010), Islam (1995), Anisuzzaman (2003), Nuruzzaman (2003), and Karim (2005) also observed positive significant relationship with organizational participation and use of

communication media in their respective studies. But Sharmin (2013) observed that organizational participation of the fish farmers had no significant relationship with their extent of use of communication media.

4.4.7 Relationship between innovativeness regarding fish farming and use of communication media

The coefficient of correlation between innovativeness of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient (r) of correlation between the concerned variable was found 0.507. On the basis of the findings, null hypothesis was rejected. Hence, innovativeness of the fish farmers had positive significant relationship with their use of communication media in receiving information regarding fish farming. This is because innovativeness influences respondents to adopt new technologies. So, respondents use more communication media to inform about latest technologies. Hossain (2008) and Nuruzzamman (2003) also found positive significant relationship with innovativeness and use of communication media in their respective studies.

4.4.8 Relationship between fish farming knowledge and use of communication media

The coefficient of correlation between knowledge of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient (r) of correlation between the concerned variable was found 0.255. Based on the findings, null hypothesis was rejected. So, it can be said that fish farming knowledge of the fish farmers had positive significant relationship with their use of communication media in receiving information regarding fish farming. Every fish farmers' has more or less knowledge about fish culture. The knowledgeable fish farmers' understood the benefits of fish culture and were interested to develop their livelihood by practicing fish culture. That's why they use more communication media for seeking information about fish culture. Sharmin (2013), Hossain (2010), Islam (2009), and Akhter (2011) also

found positive significant relationship with fish farming knowledge and use of communication media in their respective studies.

4.4.9 Relationship between fish farming experience and use of communication media

The coefficient of correlation between fish farming experience of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient (r) of correlation between the concerned variable was found 0.120. Based on the findings, null hypothesis was not rejected. So, it can be said that fish farming experience of the fish farmers had no significant relationship with their use of communication media in receiving information regarding fish farming. Sharmin (2013) & Akhter (2011) also found no significant relationship with fish farming experience and use of communication media

4.4.10 Relationship between fish farming facilities and use of communication media

The coefficient of correlation between fish farming facilities and their use of communication media was presented in Table 4.16. The coefficient (r) of correlation between the concerned variable was found 0.169. On the basis of the findings, null hypothesis was not rejected. So, it can be said that fish farming facilities of the fish farmers had no significant relationship with their use of communication media in receiving information regarding fish farming. Uddin (2007) also observed no significant relationship with farming facilities and use of communication media.

4.4.11 Relationship between problems faced in fish farming and use of communication media

The coefficient of correlation between problem of the fish farmers and their use of communication media was presented in Table 4.16. The coefficient of correlation (r) between the concerned variable was found 0.102. Based on the findings, null hypothesis was not rejected. Hence, it can be said that problem of the fish farmers had no significant relationship with their use of communication media. Hossain (2013) also observed no significant relationship with problem faced and use of communication media in his studies.

CHAPTER 5
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of findings

The findings of the study and interpretation of the results have been presented elaborately in chapter 4. The findings of the study are now summarized below.

5.1.1 Characteristics of the fish farmers

Age: Majority (42.86 %) of the fish farmers were middle aged compared to 33.04 % young aged and 24.10 % were old aged.

Education: Large proportion 50.89 % of the fish farmers fall under category of "secondary" compared to 23.21 % comprised above secondary of education, 14.29 % comprised primary education, 7.14 % can sign only and 4.47 can't read & write.

Capital for fish farming: Highest proportion (47.32 %) of the fish farmers had medium capital compared to 34.82 % had low capital and 17.87 % had high capital for fish farming.

Fish cultivation area: Highest proportion (58.93 %) of the fish farmers had small fish cultivation area compared to 40.18 % had medium and 0.89 % had large fish cultivation area.

Annual income from fish culture: Highest proportion (46.43 %) of the fish farmers had medium annual income compared to 36.61 % of them having low annual income and 16.96 % high annual income.

Organizational participation: Highest proportion (33.93 %) of the fish farmers had low organizational participation, 32.14 % had medium organizational participation and 26.79 % had high organizational participation and 7.14% had no organizational participation.

Innovativeness regarding fish farming: Highest proportion (43.75 %) of the respondents had medium innovativeness, while 31.25% had low innovativeness and 25% had high innovativeness.

Fish farming knowledge: Highest proportion (47.32 %) of the fish farmers had medium knowledge, while 41.97 % had high and 10.71 % had low knowledge on fish farming.

Fish farming experience: Highest proportion (39.29%) of the fish farmers had mid-term experience compared to 33.04% short-term and 27.67% long-term experience.

Fish farming facilities: Highest proportion (52.68%) of the fish farmers had medium fish farming facilities compared to 30.36% high and 16.96% low fish farming facilities.

Problem faced in fish farming: Majority (48.21%) of the fish farmers had medium problem compared to 37.50% high and 14.29% had low problem faced in fish farming.

5.1.2 Fish farmers use of communication media

Majority (36.61%) of the fish farmers had low communication media use, 33.93% had medium communication media use and 29.46% had low communication media use.

5.1.3 Comparative use of communication media by the fish farmers

Majority of the respondents preferred fish farmers' as a source of communication media in receiving information regarding fish farming. The other communication media such as input dealers, television, fisheries officers, group discussion and demonstration were also used by the fish farmers as a source of information regarding fish farming.

5.1.4 Relationships between the selected characteristics of the fish farmers and use of communication media

The selected characteristics of the fish farmers such as capital for fish farming, fish cultivation area, annual income from fish culture, organizational participation, innovativeness regarding fish farming and fish farming knowledge had positive significant relationship with their use of communication media in receiving information regarding fish farming. On the other hand age, education, fish farming experience, fish farming facilities and problem faced in fish farming by the farmers had no significant relationship with their use of communication media in receiving information regarding fish farming.

5.2 Conclusions

Conclusions drawn on the basis of the findings of this study and their logical interpretation in the light of the other relevant factors are furnished below:

1. The findings indicate that majority (36.61%) of the respondents had low use of communication media, 33.93% had medium communication media use and 29.46% had high communication media use. So, it can be concluded that the fish farmers need more exposure to communication media to receive information regarding fish farming.

2. Fish farmers, input dealers, Upazila Fisheries Officers were used more as a communication media by the fish farmers. Group media contact had moderate use by the fish farmers. So, it may be concluded that although fish farmers used different types of communication media but they preferred individual contact media more.

3. Among the mass media majority of the respondents preferred television as communication media but less portion of the fish farmers used radio and leaflet/bulleting. In conclusion it can be said that, this is because people are now more aware about technology.

4. Capital of the fish farmers had positive significant relationship with the extent of use of communication media. Fish farmers having high capital were more solvent and had more purchasing capacity. So, it may be concluded that the high capital of the fish farmers had significantly higher the use of communication media.
5. Annual income of the fish farmers from fish culture had positive significant relationship with the extent of use of communication media regarding fish farming. So, it may be concluded that the high annual income of the fish farmers from fish farming significantly contributes to increase the use of communication media.
6. Organizational participation of the fish farmers had positive significant relationship with the extent of use of communication media regarding fish farming. So, it may be concluded that the fish farmers with more organizational participation are expected to have more interest in using different communication media regarding fish farming.
7. Knowledge of the fish farmers on fish farming had positive significant relationship with the extent of use of communication media. The farmers having more fish farming knowledge induces them to receive more fish farming knowledge. It may, therefore, concluded that the high knowledge help to increase the way of using communication media.
8. Innovativeness of the farmers had positive significant relationship with the extent of use of communication media. It may, therefore, concluded that the use of communication media is a vital factor in increasing the innovativeness of the farmers.

5.3 Recommendations

Based on the findings and conclusions of the study, the following recommendations were made.

5.3.1 Recommendations for policy implementation

1. In the study area rate of use of communication media is not satisfactory. So, necessary steps should be taken by the Department of Fisheries (DoF) and Non-Government Organizations (NGOs) to motivate the farmers to increase the use of communication media.
2. Capital of the fish farmers had positive significant relationship with their use of communication media. There for it may be recommended that motivational campaign should be increased by the Department of Fisheries and other relevant organizations. So, the farmers can increase their investment for fish production.
3. Knowledge and innovativeness of the fish farmers had positive significant relationship with their use of communication media. Attempt should be taken by the DoF and other relevant organization by providing necessary training to increase the knowledge and innovativeness of the fish farmers.
4. Fish cultivation area and annual income of the fish farmers had positive relationship with their use of communication media. Therefore, it may be recommended that DoF and other relevant organization should encourage fish farmers to use maximum land for cultivating fish and also improve marketing facilities for the fish farmers. So, the farmers can increase their income.
5. Organizational participation of the fish farmers had positive significant relationship with their use of communication media. Therefore, it may be recommended that DoF, different organizations, NGOs and other relevant organization should encourage the fish farmers to participate in different organizations. So, the farmers get more opportunities to use different communication media.
6. To get diversified information, highly use/dependency on only one media such as local fish farmers is not effective. So, the DoF and different extension organizations should ensure the use of various kinds of communication media by the fish farmers.

5.3.2 Recommendations for future research

1. The present study was conducted only in four villages of Jugli union of Haluaghat Upazila under Mymensingh District. Findings of the study need further verification through similar research in other parts of the country.
2. This study investigated the effects of eleven characteristics of the fish farmers on their use of communication media in receiving information regarding fish farming. Therefore, it is recommended that further studies should be conducted involving other variables in these regards.
3. The present study did not reveal the factors that affected the non-use of communication media. It is, therefore, suggested that the factors responsible for non-use of each media be ascertained in future studies.
4. It is recommended that some researches should be undertaken to determine the preferences of the communication media by the fish farmers in a wide range of situations particularly from ecological considerations.

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Appendix-A

ENGLISH VERSION OF THE INTERVIEW SCHEDULE
DEPARTMENT OF AGRICULTURAL EXTENSION AND INFORMATION SYSTEM
SHER-E- BANGLA AGRICULTURAL UNIVERSITY
SHER-E- BANGLA NAGAR, DHAKA-1207.

INTERVIEW SCHEDULE FOR A RESEARCH STUDY ENTITLED

"USE OF COMMUNICATION MEDIA BY THE FARMERS REGARDING FISH FARMING"

Serial No: ……

Respondent Name:……..

Village: ……. Union:……..Upazila:…….District:…….

(Please provide following information. Your information will be kept confidential and be used for research purpose only)

1. **Age**

   What is your age? ..... Years

2. **Education**

   What is your level of education?

   a. Can't read and write ……..
   b. Can sign only …….
   c. Have passed class ……..

3. **Capital for fish farming**

   How much money have you invested in fish farming? ……..... BDT.

4. **Fish cultivation area**

Sl. no.	Pattern of ownership of pond	Pond area	
		Local unit	Hectare
1	Own pond		
2	Pond taken from others on lease		
Total			

5. Annual income from fish culture

Please mention your last year income from fish culture in …… BDT.

6. Organizational participation

SL No.	Organizations	Nature and distribution of participation (years)			
		No participation	**Ordinary member**	**Executive member**	**Executive officer**
1.	Farmer co-operative society				
2.	Feed, Fertilizer & Pesticide dealer association				
3.	Union parishad				
4.	NGO organization Committee				
5.	Hat/Bazaar Committee				
6.	Mosque Committee				

7. Innovativeness regarding fish farming

Sl No	Name of the technology	Never used	Nature of the innovativeness			
			Within 1 year after hearing	Within >1 to 2 years after hearing	Within >2 to 3years after hearing	After 3 Years of hearing
1.	Poly culture/ Mixed culture					
2.	Integrated fish culture					
3.	Cage culture					
4.	Mono-sex tilapia					
5.	Thai koi					
6.	Carp culture					
7.	Thai pangas					

8. Fish farming Knowledge

Sl No	Questions	Total marks	Marks obtained
1.	Mention the name of two high yielding fish variety	2	
2.	Mention two methods of controlling aquatic weeds	2	
3.	Mention two preventive measures of disease outbreak	2	
4.	Mention the name of two chemical herbicides	2	
5.	What will be the water color of productive pond?	2	
6.	Mention the name of two diseases of fish	2	
7.	Why do you apply lime in your pond?	2	
8.	Mention the dose of lime application in pond per decimal	2	
9.	What is the suitable time for releasing fry in pond?	2	
10.	Mention two predatory fish	2	

9. Fish farming experience

How long are you engaged in fish farming? ……years

10. Fish farming facilities

Items	Abundant	Adequate	Moderate	Least	Not at all
1. Fish fry					
2. Fish feed					
3. Mash					
4. Labor					
5. Weedicide/Herbicide					
6. Loan					
7. Storage					
8. Transportation					
9. Marketing					

11. Problem faced in fish farming

Sl. No	Problem	Extent of problems				
		High	Medium	Low	Very low	Not at all
1.	Lack of technical knowledge					
2.	Lack of Marketing facilities					
3.	Incidence of disease					
4.	Inadequate supply of inputs (fry, fertilizer, hormone, vaccine) in time					
5.	Unavailability of quality feed					
6.	High production cost					
7.	Unavailability of necessary information					
8.	Lack of fish preservation method					
9.	Lack of available labor					
10.	Oxygen deficiency					

12. Extent of use of communication media

a. Please indicate the frequency of contact with information sources for pond construction and design

Information sources	Frequency of contact			
	Frequently (3)	**Occasionally (2)**	**Rarely (1)**	**Not at all (0)**
A. Individual Contact (times/month)				
Model/Neighbor fish farmers	≥8 times	4-7 times	1-3 times	0
Upazila Fisheries Officer (UFO)	≥5 times	3-4 times	1-2 times	0
Input dealer (Feed, Fertilizer & pesticide trader)	≥5 times	3-4 times	1-2 times	0
B. Group Media (times/year)				
Group discussion or group meeting	≥5 times	3-4 times	1-2 times	0
Demonstration meeting/ field day	≥3 times	2 times	1 time	0
Participation in fish farmer rally/fairs and other extension events	≥3 times	2 times	1 time	0
C. Mass Media (times/month)				
Watching agricultural programme on TV	≥5 times	3-4 times	1-2 times	0
Listening agricultural programme on radio	≥5 times	3-4 times	1-2 times	0
Reading leaflet/bulletin/ magazines etc.	≥5 times	3-4 times	1-2 times	0

b. Please indicate the frequency of contact with information sources for different methods of Fish Farming (Integrated Fish culture, Mixed culture, Cage culture, Pen culture etc.)

Information sources	Frequency of contact			
	Frequently (3)	**Occasionally (2)**	**Rarely (1)**	**Not at all (0)**
A. Individual Contact (times/month)				
Model/Neighbor fish farmers	≥8 times	4-7 times	1-3 times	0
Upazila Fisheries Officer (UFO)	≥5 times	3-4 times	1-2 times	0
Input dealer (Feed, Fertilizer & pesticide trader)	≥5 times	3-4 times	1-2 times	0
B. Group Media (times/year)				
Group discussion or group meeting	≥5 times	3-4 times	1-2 times	0
Demonstration meeting/ field day	≥3 times	2 times	1 time	0
Participation in fish farmer rally/fairs and other extension events	≥3 times	2 times	1 time	0
C. Mass Media (times/month)				
Watching agricultural programme on TV	≥5 times	3-4 times	1-2 times	0
Listening agricultural programme on radio	≥5 times	3-4 times	1-2 times	0
Reading leaflet/bulletin/ magazines etc.	≥5 times	3-4 times	1-2 times	0

c. Please indicate the frequency of contact with information sources for fish farming with improved varities (Monosex Talapia, Thai koi, Thai Panghus, Nilotica, Carp Mixed Culture etc.)

Information sources	Frequency of contact			
	Frequently (3)	**Occasionally (2)**	**Rarely (1)**	**Not at all (0)**
A. Individual Contact (times/month)				
Model/Neighbor fish farmers	≥8 times	4-7 times	1-3 times	0
Upazila Fisheries Officer (UFO)	≥5 times	3-4 times	1-2 times	0
Input dealer (Feed, Fertilizer & pesticide trader)	≥5 times	3-4 times	1-2 times	0
B. Group Media (times/year)				
Group discussion or group meeting	≥5 times	3-4 times	1-2 times	0
Demonstration meeting/ field day	≥3 times	2 times	1 time	0
Participation in fish farmer rally/fairs and other extension events	≥3 times	2 times	1 time	0
C. Mass Media (times/month)				
Watching agricultural programme on TV	≥5 times	3-4 times	1-2 times	0
Listening agricultural programme on radio	≥5 times	3-4 times	1-2 times	0
Reading leaflet/bulletin/ magazines etc.	≥5 times	3-4 times	1-2 times	0

d. Please indicate the frequency of contact with information sources for pond management (Fertilization, Liming, Weeding, Fry density, Removal of Predatory fish, Disease management etc.)

Information sources	Frequency of contact			
	Frequently (3)	**Occasionally (2)**	**Rarely (1)**	**Not at all (0)**
A. Individual Contact (times/month)				
Model/Neighbor fish farmers	≥8 times	4-7 times	1-3 times	0
Upazila Fisheries Officer (UFO)	≥5 times	3-4 times	1-2 times	0
Input dealer (Feed, Fertilizer & pesticide trader)	≥5 times	3-4 times	1-2 times	0
B. Group Media (times/year)				
Group discussion or group meeting	≥5 times	3-4 times	1-2 times	0
Demonstration meeting/ field day	≥3 times	2 times	1 time	0
Participation in fish farmer rally/fairs and other extension events	≥3 times	2 times	1 time	0
C. Mass Media (times/month)				
Watching agricultural programme on TV	≥5 times	3-4 times	1-2 times	0
Listening agricultural programme on radio	≥5 times	3-4 times	1-2 times	0
Reading leaflet/bulletin/ magazines etc.	≥5 times	3-4 times	1-2 times	0

e. Please indicate the frequency of contact with information sources for water management (Liming, Using Aerators, Using Chemical, Using bamboo, Netting or Harra pulling in the pond etc.)

Information sources	Frequency of contact			
	Frequently (3)	**Occasionally (2)**	**Rarely (1)**	**Not at all (0)**
A. Individual Contact (times/month)				
Model/Neighbor fish farmers	≥8 times	4-7 times	1-3 times	0
Upazila Fisheries Officer (UFO)	≥5 times	3-4 times	1-2 times	0
Input dealer (Feed, Fertilizer & pesticide trader)	≥5 times	3-4 times	1-2 times	0
B. Group Media (times/year)				
Group discussion or group meeting	≥5 times	3-4 times	1-2 times	0
Demonstration meeting/ field day	≥3 times	2 times	1 time	0
Participation in fish farmer rally/fairs and other extension events	≥3 times	2 times	1 time	0
C. Mass Media (times/month)				
Watching agricultural programme on TV	≥5 times	3-4 times	1-2 times	0
Listening agricultural programme on radio	≥5 times	3-4 times	1-2 times	0
Reading leaflet/bulletin/ magazines etc.	≥5 times	3-4 times	1-2 times	0

f. Please indicate the frequency of contact with information sources for feed management (Supplement feed, Secchi desk test, Gamchha glass test, Hand method etc.)

Information sources	Frequency of contact			
	Frequently (3)	**Occasionally (2)**	**Rarely (1)**	**Not at all (0)**
A. Individual Contact (times/month)				
Model/Neighbor fish farmers	≥8 times	4-7 times	1-3 times	0
Upazila Fisheries Officer (UFO)	≥5 times	3-4 times	1-2 times	0
Input dealer (Feed, Fertilizer & pesticide trader)	≥5 times	3-4 times	1-2 times	0
B. Group Media (times/year)				
Group discussion or group meeting	≥5 times	3-4 times	1-2 times	0
Demonstration meeting/ field day	≥3 times	2 times	1 time	0
Participation in fish farmer rally/fairs and other extension events	≥3 times	2 times	1 time	0
C. Mass Media (times/month)				
Watching agricultural programme on TV	≥5 times	3-4 times	1-2 times	0
Listening agricultural programme on radio	≥5 times	3-4 times	1-2 times	0
Reading leaflet/bulletin/ magazines etc.	≥5 times	3-4 times	1-2 times	0

Thank you for your kind co-operation.

Signature with date

Appendix-B: Correlation Matrix

VARIABLES	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
X1	1											
X2	-.199*	1										
X3	.003	.312**	1									
X4	.119	.156	.541**	1								
X5	.063	.233*	.850**	.562**	1							
X6	.386**	.019	.231*	.258**	.238*	1						
X7	.029	.081	.399**	.447**	.452**	.277**	1					
X8	.067	.166	.151	.212*	.165	.175	.112	1				
X9	.340**	-.151	.006	.378**	.033	.316**	.181	.271**	1			
X10	-.125	.350**	.181	.071	.237*	-.001	.177	.077	-.104	1		
X11	.080	-.217*	-.012	.138	-.027	.026	.054	-.088	.191*	-.291**	1	
X12	.050	.176	.306**	.338**	.405**	.273**	.507**	.255**	.120	.169	.102	1

X1= Age
X2= Education
X3= Capital for Fish Farming
X4= Fish Cultivation Area(ha)
X5= Annual income from fish culture
X6= Organizational Participation
X7= Innovativeness Regarding Fish Farming
X8= Fish Farming Knowledge
X9= Fish Farming Experience
X10= Fish Farming Facilities
X11= Problem Faced in Fish Farming
X12=Extent of use of communication media