KNOWLEDGE OF THE FARMERS TOWARDS PRAWN CULTURE IN SPECIFIC AREA OF KHULNA DISTRICT

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CERTIFICATE

This is to certify that the thesis entitled **"Knowledge of the Farmers On Prawn Culture in Specific Area of Khulna District"** submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE** in **AGRICULTURAL EXTENSION AND INFORMATION SYSTEM**, embodies the result of a piece of bona fide research work carried out by **Sk. FUAD AHMED**, Registration No. 00913 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

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Dedicated
To
My Beloved
Parents and Sisters

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ABSTRACT

The study was conducted in the Dumuria Upazilla under Khulna district. Three villages namely **Alonia**, Kazirpur and Atilpara from number 8 Dehergoti union have been selected purposively for the study. Total 105 farmers constituted the sample of the study. The independent variables were: age, education, family size, duration of involvement with prawn culture, farm size, annual income, training experience, extension media contact, cosmopoliteness, credit received, attitude of the farmers towards prawn culture and problems faced by the farmers. Data collection was started on 1 May, 2008 and completed on 30 May, 2008. Among the respondents farmers the middle aged farmers constitute the highest proportion (60.96 percent) and the lowest proportion were made by the old aged category (9.52 percent). Farmers under 'secondary education category constitutes the highest proportion (41.90 percent) and the lowest 11.43 percent were illiterate. The small family category constitute the highest proportion (44.76 percent) followed by medium size family category (40.95 percent) and large family category (14.29 percent). About 29.52% respondents were engaged with prawn culture below 10 years and 49.52% respondents were involved in 11-20 years and 22.95 percent above 21 years. Small farm holder constitutes the highest proportion 54.29 percent and the lowest 2.86 percent marginal farm holder and followed by 11.43 percent large farmers. The farmers family having medium income constitute the highest proportion (50.48 percent) followed by the farmers family having low annual family income (40.95 percent) and high annual family income (8.57 percent). Among the total respondents about 34.29 percent of the farmers received low duration training, 32.38 percent received medium duration training and 33.33 percent in long duration training. About 56.19 percent of the respondents had low media contact while 36.19 percent had medium media contact and 7.62 percent had high media contact. The farmers have medium cosmopoliteness category constitute the highest proportion (50.48 percent) followed by low cosmopoliteness (40 percent) and high cosmopoliteness category (9.52 percent). Among the total respondents farmers about 61.90 percent farmers received credit upto Tk. 15 thousand, while 27.62 percent farmers received credit from medium (15-20 thousand) score credit receiver and 10.48 .

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INTRODUCTION

1.1 General Background

Bangladesh has been a promising country in its development. It is blessed with a considerable amount of natural resources like gas, coal, vast suitable land for agriculture. Water resources in the form of ponds, beels, haors (natural depression), baors (ox-box lakes), canals, rivers, floodplains, and reservoirs are one of them. It has also a large coastal area of 710 km covering 25,000 square kilometers of 13 coastal districts.

The economy of the county also based on agriculture. Fisheries sector is one of most important and potential sector of Bangladesh. The fisheries sector also plays a dynamic role in nutrition, employment and foreign exchange earning in overall economy of Bangladesh. About 63 percent of animal protein is supplied by fish (DOF, 2005). It has been estimated that about 1.3 million people are directly employed in this sector. Another 12 million people indirectly earn their livelihood from fisheries related activities. Frozen shrimp, prawn, fish and fishery products occupy the second position in the country exports. In 2003-2004, fisheries sector contributed about 4.92 percent to the total GDP of the country (DOF, 2005).

The coastal zones as well as the other areas of Bangladesh becomes potentials ground for prawn (*Macrobrachium rosenbergii)* culture due to its greater opportunity and also favorable reasons e. g, availability of tidal land, water by

heavy rain during monsoon, warm temperature throughout the year, fertile soil with internal drainage and cheap labor force. Prawn cultivation is comparatively a new entrepreneurship farming approach in Bangladesh and it has started to develop since early 1970s. Since then, it has been playing a vital role in economic development of Bangladesh. The cultivation of prawn has been increased because of market demand and price reached the level much higher than ever before. In late 1970s, it became a major source of foreign exchange earning commodity and still it is in the second position. The year wise exports of frozen prawn and shrimp and their value are mentioned blew in Table 1.1. Every year Bangladesh earns a lot of foreign currency by exporting frozen fish product. Prawn and shrimp occupy the major contribution (92.74 percent). In 2004-2005, Bangladesh earns 2571.72 crores taka by exporting fish and fish products, while the amount of earning from frozen prawn and shrimp 2218.59 crores taka.

Table 1.1 Export of frozen prawn and shrimp from Bangladesh

Year	Quantity (M.t.)	Value in taka (Crores)
1995-1996	25,225	1106.36
1996-1997	25,742	1138.91
1997-1998	18,630	1181.48
1998-1999	20,127	1162.21
1999-2000	28,514	1612.15
2000-2001	29,713	1885.15
2001-2002	30,209	1441.76
2002-2003	36,864	1719.88
2003-2004	42,943	2156.77
2004-2005	24,533	2218.59

Source: DOF, 2005

In Bangladesh there are many shrimp species among which two are mainly commercially cultivated. These are mainly *Bagda* and *Galda*. In coastal area as well as other part of Bangladesh is suitable for *Golda* cultivation, especially in the lands where fresh water stands for a long time in a year. The present study was conducted to look at *Golda* cultivation in a selected area of Khulna district. Prawn farming followed in Bangladesh remains traditionally based. Very few changes have been occurred. In Khulna region, farmers cultivate rice-*bagda* or rice *galda* in an alternate way or combinedly with the help of "*Bheri chash*" method which is a century old practice.

After the emergence of Bangladesh, however, in mid 70s prawn and shrimp especially frozen prawn became a highly demanded item in the international market. Having realized the prospect of prawn export, many local rich people, businessman and innovative farmers emphasized the horizontal expansion of prawn culture in their suitable land within the embanked polders in Khulna, Satkhira and Bagerhat. Their operational practice was characterized by low yield associated with low technical and financial investments. They did not normally use any scientific technology and follow traditional methods. At a later date, some better technology and new methods of cultivation were evolved in 1980s with the help of Bangladesh Government, some foreign organizations like Food and Agriculture Organization (FAO), Swedish International Development Agency's (SIDA) Bay of Bengal Program. However, the first aquaculture project of ADB and World Bank was the pioneer in this work.

1.2 Statement of the Problem

Prawn culture is increasing in Bangladesh day by day. A dynamic change in prawn culture has already been observed in Bangladesh. The researcher undertook the investigation entitled, "Knowledge of the farmers on prawn culture in a selected area of Khulna district" in order to have an understanding of the knowledge of prawn culture in the country. Research information is required which could be helpful to the policy maker, regarding supply of inputs, technological knowledge and problems being encountered. The purpose of the study was to investigate the extent of knowledge in prawn culture and to explore the relationship of the selected personal, economic, social and psychological characteristics with the knowledge in prawn culture. An attempt was also made to identify the problems faced by the farmers in prawn culture. In order to make the study manageable, the following research questions were taken into consideration.

i) To what extent the farmers have knowledge in prawn culture?

ii) What are the selected characteristics of the farmers?

iii) What relationships exist between the farmers selected characteristics and their knowledge in prawn culture?

iv) What are the problems confronted by the farmers during prawn culture?

1.3 Specific Objectives of the Study

1. To determine farmers' knowledge in prawn culture.
2. To determine and describe the selected characteristics of the farmers of prawn culture. The selected characteristics are:

- Age
- Education
- Family size
- Duration of involvement with prawn culture
- Farm size
- Annual income
- Training experience
- Extension media contact
- Cosmopoliteness
- Credit received
- Attitude towards prawn culture
- Problems faced by the farmers

3. To explore the relationships between each of the selected characteristics of the farmers and their knowledge towards prawn culture.

1.4 Justification of the Study

The major focus of the study is to assess farmers' knowledge of prawn culture. Prawn culture is getting popularity among the farmers of coastal areas of Bangladesh and the price of prawn is too high in foreign market. Prawn in now popularly known as the "white gold" of Bangladesh. Researchers show conclusively that prawn bear a far more prospect in the economy of Bangladesh. One of the strategically policies would be followed intensive cultivation by adopting scientific knowledge such that total value of production would be increased with yield increment. This could be possible only by adopting scientific knowledge. Considering the above facts and findings, the researcher became

interested to undertake a study to determine the knowledge in prawn culture by the farmers based on farm level primary data. As there is no research in the field on this topic, the researcher deemed it a timely necessity to undertake the present study entitled "Knowledge of the farmers on prawn culture in a selected area of Khulna district."

1.5 Assumption and Limitations of the Study

An assumption is the supposition that an apparent fact or principle in true in the light of the available evidence (Goode, 1945). The researcher had following assumption in mind while undertaking this study.

- The respondents included in the sample had the potential of furnishing proper responses to queries reflected in the interview schedule as needed by the interviewer.
- The researcher was well adjusted to the social environment of the study area since he hails from the same community. Hence the data collected by him may be reliable.
- The responses furnished by the respondents were reliable and they expressed the truth about their convictions and opinions.
- The views and opinions furnished by the respondents included in the sample were representative views and opinions of the whole population of the study area.

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

- The study was confined to Dumuria upazila under Khulna district.
- The study was confined mainly on knowledge on prawn culture.
- Characteristics of prawn growers are many and varied but only eleven were selected for investigation in this study as stated in the objectives. This was done to complete the study within limited resources.
- Facts and figures were collected by the investigator applied to the present situation in the selected area.
- Population and consequently the samples for the study were confined to the heads of prawn farm families although other members could also be the subjects of the study.

1.6 Definition of the Terms

The key terms used in this study are defined in this section for clarity of understanding.

Age

Age of the respondent was defined as the period of time in actual years from his birth to the time of interview.

Annual income

It referred to the annual earning of the entire family members from agriculture and other non-agriculture sources (like services, business and day labour etc.) during a year.

Attitude

Attitudes are learned, emotionally predispositions to react in a consistent way, favorable or unfavorable, towards person's objects, situation, or ideas. Attitude has three components: (i) a cognitive component the beliefs about the objectives, (ii) an affective or feeling component, and (iii) a behavioral or action tendency component. The term attitude towards prawn culture of a farmer is, therefore, used to refer to her beliefs, feelings and action tendencies towards the various aspects of prawn culture.

Education

Education referred to the development of desirable change in knowledge, skill, attitude and ability in an individual through reading, writing, working, observing and other related activities. It was operationalized by the formal education of a farmer by taking into account of the years he spent in formal educational institutions.

Extension media contact

Extension media contact refers to an individual's level of exposure with the aforesaid media for prawn culture.

Farm size

It refers to the area owned by farmer including the homestead on which he carried on her farming and family business, the area being estimated in terms of full benefit to the farmer. A farmer on considered to have full benefit from cultivated area either owned by himself or obtained on lese from others and half benefit from the area, which was either cultivated by himself on borga or given to others form cultivation on borga basis.

Gher

Gher is a Bengali word used to describe coastal fisheries in the south-western region of Bangladesh. The local name of prawn farm is known as *gher*.

Knowledge about prawn culture

It refers to ones' content in the cognitive domain on prawn cultivation or holding facts or information on the same which may lead to his behavioral change in actual life situation.

Organizational participation

The term organization is defined as an association of persons, which has a name, a regular set of officers, and at lest one face-to-face meeting in a year. Organizational participation of an individual refers to his participation in various organizations as ordinary member, executive committee member or executive officer with a specific period of time.

Post Larvae (P.L) or Fry

The very earlier stage of juvenile of shrimp is termed as post larvae or fry. This name is also used as commercial purposes.

Prawn

Prawn belongs to phylum Arthropoda, class Crustacea under the order Decapoda. It is a nocturnal animal which is deliberately grown in fresh water called prawn. Its scientific name is *Macrobrachium rosenbergii*.

Prawn culture experience

It means the experience of farmers which he acquired through performing of prawn farming activities.

Cosmopoliteness

Cosmopoliteness is the degree to which an individuals orientation in external to her own social system (Rogers, 1995).

Training experience

It refers to the total number of days that a respondent received training in his entire life from different organizations under different training program.

Technologies

A technology is design to instrumental action that reduces the uncertainty in the cause effect relationships involved in achieving desired outcomes. In other words, the combination of all the management practices used for producing and

otherwise managing a given crop, crop mixture, livestock, fisheries and other farmers activities.

Problem

Problem means difficult situation which requires some actions to minimize the gap between "what ought to be" and 'what is". The term problem refers to difficult situation faced by the farmers for prawn culture.

Control of diseases

It is a process, which involves the use of some methods or techniques to control, elimination and also to prevent the spread of a particular disease and problem existing to the prawn.

Chapter II

REVIEW OF LITERATURE

This chapter deals with the review of past research works that relates to this investigation directly or indirectly. Review of literatures expediently to the major objectives of this study is presented in this chapter. Despite frantic search, the research found only a few studies are available all of them are indirectly related. The researcher came across with some expert opinions about the concept of knowledge and has tried his best to collect needful information through searching relevant studies, journals, periodicals, bulletins, leaflets, internet etc. These enhanced the researcher's knowledge for better and clear understanding of the present study. This chapter has been presented in three sections as follows:

Section 1: Review of literature related to concept, components, formation and measurement of knowledge

Section 2: Relationship between selected characteristics of the respondents and their knowledge

Section 3: The development of conceptual framework of the study

2.1 Farmers' knowledge

Khan (2005) studied on farmers' knowledge of maize cultivation and found that majority (68 percent) of the farmers had relatively low level of knowledge and 32 percent of the farmers had possessed relatively high level of knowledge.

Sarker (2002) studied on farmers' knowledge on improved banana cultivation practices and showed that majority of the banana growers (83.7 percent) had moderate, 6.1 percent had poor and the rest 10.2 percent had good knowledge.

Sana (2003) studied on farmers' knowledge of shrimp culture and showed that majority (61 percent) of the farmers had medium level of knowledge while 30 percent had low and rest nine (9) percent had possessed high knowledge.

Sarker (2002) studied on farmers' knowledge of and attitude towards BRRI Dhan 29 variety of rice and show that 60 percent of the farmers held medium knowledge 33 percent high knowledge and 7 percent possessed low knowledge.

Saha (2001) made an attempt on farmers knowledge in improved practices of pineapple cultivation and found that the majority (62 percent) of the farmers possessed good knowledge, 33 percent poor knowledge and only 5 percent possessed excellent knowledge.

Mannan (2001) conducted a study on knowledge about food and nutrition of the farmers under Proshika mung and found that highest proportion (75 percent) respondents fell in the medium knowledge level, while 9 percent of the respondents fell in the low knowledge level and 16 percent in the high knowledge category.

Hussen (2001) in his study found that 84 percent of the farmers had medium, 13 percent had high knowledge and the lowest proportion (3 percent) possessed low knowledge on modern sugarcane cultivation practices.

Hossain (2000) also in his study on farmers' knowledge and perception of Binadhan-6 in the Boro season found that highest proportion (65 percent) of the farmers possessed medium knowledge, 21 percent low knowledge and lowest proportion (14 percent) possessed high knowledge.

Nurzaman (2000) also in his study on knowledge, attitude and practice of FFS and non-FFS farmers in respect of IPM found that 46.67 percent of the FFS farmers had medium, 31.67 percent had high and 21.67 percent had low IPM knowledge while among the non-FFS farmers, 98.33 percent had low and only 1.67 percent had medium IPM knowledge. In the same study he found that 60 percent of the FFS farmers had medium knowledge, 25 percent low and 15 percent had high agricultural knowledge. The majority (55 percent) of the non-FFS farmers had low agricultural knowledge and rest (45 percent) of the non-FFS farmers had medium agricultural knowledge.

Khan (1996) conducted a research on the effectiveness of "A Farmer Primer on Growing Rice" in knowledge change of the farmers in Shakhipur Thana and found that 67 percent farmers had good knowledge at initial stage, where 21 percent had excellent knowledge and 12 percent had poor knowledge.

Parveen (1995) in her study found that 58 percent of the farm women had moderate knowledge while 35 percent had high and 7 percent had poor knowledge on the use of fertilizers, pesticides and irrigation water.

Rahman *et al.* (1988) conducted a study on health cover practices of poultry and found that 26 percent of the farm women possessed low level of knowledge while 74 percent possessed medium level and none possessed high level of knowledge.

Haque (1986), following a study on a quasi-experiment design, tested rice farming knowledge of field extension agents employed in two provinces Leyte and Sodium Leyte of the Philippines. The numbers of agents were 44 selected randomly from each province. There rice farming knowledge was measured before the intervention (treatment) was initiated. Result showed that 75 percent possessed low knowledge and 25 percent possessed high knowledge by the Leyte agents. The percentage of the knowledge in that level orders were 70 and 30, respectively. The t-statistics show that there were no differences in rice farming knowledge between the agents in two locations.

Ahmed (1974) ascertained the farmers' knowledge on five aspects of farming. The comprehensive knowledge scores show that 44 percent of the farmers possessed low knowledge, 41 percent medium knowledge and 15 percent high knowledge.

2.2 Relationship between farmers' characteristics and knowledge

2.2.1 Age and knowledge

Bhaskaram and Mahajan (1968) reported that young farmers had gained more information on agricultural technology.

Chandargi (1980) found that there was significant association between age and knowledge gain as a result of training.

Hansara and Chopra (1986) found that there was a significant negative correlation between gain in knowledge about cattle disease and age of the respondents i.e, the more was the age of the respondents, less was their gain in knowledge.

Kashem (1987) in his study on the small farmers' constraints to the adoption modern rice technology found that age of the farmers had significant negative correlation with their agricultural knowledge.

Rayspreddy and Jayarmaiah (1989) revealed that age of the VEOs showed negative relationship with their knowledge level on rice production technologies.

Islam (1993) in his study concluded that age of the BSs had no significant relationship with their knowledge on modern agricultural technology.

Khan (1996) conducted a research on the effectiveness of "A Farmers primer on Growing Rice" in knowledge change of the farmers in Shakhipur thana and found that age of the respondent had no role with the three dependent variables namely initial rice knowledge, final rice knowledge and knowledge gain.

Nandiwal *et al.* (1999) in their study on knowledge and adoption level of the farmers about rice production technology. The research was conducted at Kheda district of Gujarat state. They found that age of the farmers had non significant correlation with their knowledge about rice production;

Hossain (2000) in his study found that age of the farmers had no significant relationship with their knowledge on Binadhan-6 technology.

Saha (2001) made an attempt on farmers' knowledge on improved practices of pineapple cultivation and found that the age of the farmers had no significant relationship with their knowledge on improved practices of pineapple cultivation.

Rahman (2001) conducted a study to determine the knowledge, attitude and adoption of the farmers regarding Alok 6201 hybrid rice. He found that age of the farmers was not related to farmers' knowledge on Alok 6201 hybrid rice.

Sarker (2002) conducted a study on farmers' knowledge of and attitude towards BRRI Dhan 29 variety of rice and found that the age of the farmers was not related to farmers' knowledge on BRRI Dhan 29.

Akter (2003) found in his study that the age of the farmers had no significant relationship with their knowledge on agricultural activities.

Saha (2003) found no relationship between poultry farmers' age and their knowledge on poultry production.

Rahman (2004) found in his study that age of the farmers had no significant relationship with their knowledge on boro rice cultivation.

Khan (2005) found in his study that age of the farmers was not related to their knowledge of maize cultivation practices.

Sarker (2002) found in his study that age of the farmers had a significant and negative relationship with their knowledge on improved banana cultivation.

2.2.2 Education and knowledge

Banerijee (1976) and Chandargi (1980) reported that farmers' education was significantly related with their knowledge.

Rathore and Shaktawat (1990) reported in their study that farmers' education was significantly related with their knowledge.

Hansara and Chopra (1986) found that education and knowledge gain in cattle disease through telecasts have highly significantly positive relationship.

Kashem (1987) in his study revealed that there was no significant relationship between education of the farmers and their agricultural knowledge.

Kumari (1988) from a study on communication effectiveness of selected mass media concluded that there was a significant association between education of the respondents (women) and attitude towards the message and knowledge level.

Islam (1993) found that the general education of the BSs had no significant relationship with their knowledge on modern agricultural technologies. However, the trend of relationship between general education and knowledge on modern agricultural technologies was negative.

Khan (1996) in his study found the formal education was related to both their initial rice knowledge (r=0.42) and their final rice knowledge (r=0.33) but also found that concerned variable was not related to their knowledge gain (r=0.02)

Hazarika *et al.* (1999) conducted a study on relative influence of socio-personal psychological and communicational traits of the farmers on gain in knowledge in plain and hilly areas of Kamrup district of Assam and found that both in hilly and plain areas education of the respondents positively and significantly related to their knowledge gain.

Hossain (2000) found that the education of the respondents had significant positive relationship with their knowledge on Binadhan-6.

Saha (2001) found that the education of the farmers had a positive significant relationship with their knowledge on improved practices of pineapple cultivation.

Sarker (2002) conducted a research on farmers' knowledge of and attitude towards BRRI Dhan 29 variety of rice and found that education of the respondents had positive relationship with their knowledge of BRRI Dhan 29

Saha (2003) found, among the six independent variables, only education was positively and significant related at 0.01 level of probability with poultry farming knowledge.

Rahman (2004) found in his study that level of education of the farmers had a significant and positive relationship with their knowledge on boro rice cultivation.

Sarker (2002) found in his study education level of the farmers had significant and positive relationship with their knowledge on improved banana cultivation.

2.2.3 Farming experience and knowledge

Mundhwa and Patel (1987) conducted a research on rainfed wheat growers' knowledge about the rainfed wheat in Bhal area of Gujarat state. He found that farming experience of the farmers had a close association with their knowledge of the requirement of the crop.

Krishnakumar *et al.* (1999) in their study concluded that farming experience of the respondents had a significant and positive correlation with their knowledge on low cost technologies (LCTS).

Sarker (2002) made an attempt on farmers' knowledge of and attitude towards BRRI Dhan 29 variety of rice found that farming experience of the farmers was not related to farmers' knowledge on BRRI Dhan 29.

2.2.4 Farm size and knowledge

Ahmed (1974) found that there is a significant relationship between farm size of the farmers and their agricultural knowledge.

Sharma and Sonoria (1983) found that both the contact and non-contact farmers were different in their size of operational holding. However, they found no significant differences in knowledge of both the contact and non-contact farmers with the size of their operational holdings.

Ali (1984) found that farm size of the contact and non-contact farmers had significant positive contribution to their agricultural knowledge.

Khan (1996) in his study indicated that farm size of the respondent was not significantly related to their initial rice knowledge, final rice knowledge and knowledge gain.

Hossain (2000) found that farm size of the farmers had no relationship with their knowledge of Binadhan-6.

Hossain (2001) in his study found that farm size of the farmers was related to farmers' knowledge of crop cultivation.

Sarker (2002) also found that there was a positive relationship between farm size of the farmers and their knowledge of BRI Dhan-29.

Akter (2003) found in his study that farm size of the farmers had a significant and positive relationship with their knowledge on agricultural activities.

Rahman (2004) found in his study that farm size of the farmers had a significant and positive relationship with their knowledge on boro rice cultivation practices.

Khan (2005) found in his study that farm size of the respondent had no relationship with their knowledge of maize cultivation

2.2.5 Annual income and knowledge

Ali (1984) also found that income of the contact and non-contact farmers differed significant positive contribution to both of their agricultural knowledge and adoption of innovations.

Nurzamman (2000) found that incomes of the rural women farmers had no relationship with their knowledge of the FFS and non-FFS farmers.

Hossain (2003) found that income of the rural women farmers had negative relationship with their knowledge of modern Boro rice cultivation.

2.2.6 Training experience and knowledge

Settee (1973) revealed that there was no association between overall knowledge Gramsavaks about extension programme planning and their frequency of in-service training. Similar was the case with specific of various aspects of extension program planning.

Manjunatha (1980) revealed that the trained farmers had higher knowledge level and adoption behaviour compared to untrained farmers.

Rayapareddy and Jayarmiah (1989) working on village extension officers (VEOs) knowledge of rice production technology found that training had significant positive relationship with the knowledge level of VEOs.

Karim and Hossain (1995) observed that the farmers differed significantly in their knowledge in sugarcane cultivation based on their exposure to training.

Hossain (2001) found that the length of the respondents had positive relationship with their knowledge of crop cultivation.

Mannan (2001) in his study found that the training received by the farmers had a positive significant relationship with their knowledge on food and nutrition.

2.2.7 Extension media contact and knowledge

Ahmed (1974) found that there is a significant positive relationship between extension contact of the farmers and their agricultural knowledge.

Ali (1984) found that contact and non-contact farmers differed significantly in respect of their media exposure. He observed that media exposure of the contact and non-contact farmers had significant contribution towards their agricultural knowledge.

Kaur (1988) found that extension contact and mass media exposure had significant influence upon opinion and level of knowledge on selected program among the rural women.

Islam (1991) in his study found that extension contact was significant related with their agricultural knowledge. Haque (1993) also found a positive relationship between extension contact and adoption of improved practices.

Rahman (1995) studied farmers' knowledge on improved practices on potato cultivation by the farmers of Kajipur upazilla under Sirajganj district. The study indicated a significant relationship between extension contact knowledge of improved practices on potato cultivation.

Khan (1996) found an insignificant relationship between extension contact of the farmers and their initial knowledge, final knowledge and also knowledge gain.

Naddiwal *et al.* (1999) conducted a research on knowledge and adoption level of the farmers about rice production technologies and concluded that extension contact of the farmers had significantly influenced farmers' knowledge.

Hossain (2000) concluded that media exposure of the farmers had a significant relationship with their knowledge of Binadhan-6.

Rahman (2001) found in his research work that media exposure work that media exposure of a farmers had a positive significant relationship with their knowledge of Aloke 6201 hybrid rice.

Sarker (2002) in his study found that the media exposure of the farmers was significant related with their knowledge of BRRI Dhan 29 variety of rice.

2.2.8 Cosmopoliteness and knowledge

Ahmed (1974) conducted that there was a relationship between cosmopoliteness of farmers and their agricultural knowledge.

Sharma and Sonoria (1983) in their study found that contact farmers' knowledge varied significantly with social participation while adoption of both contact and non-contact farmers differed significantly with their social participation.

Ali (1984) found that cosmopoliteness of contact and non-contact farmers had significant positive contribution to their agricultural knowledge.

Rahman (1995) in his study found that cosmopoliteness of potato growers had no relationship with their knowledge regarding improved practices of potato cultivation.

Khan (1996) revealed that subjects' organizational participation had insignificant relationship with their initial rice knowledge, final rice knowledge and knowledge gain.

Hazarika (1999) in his study found that social participation of the respondents was significantly associated with their knowledge gain both in plain area and hilly areas of Assam.

Hossain (2000) found no significant relationship between cosmopoliteness of the farmers and their knowledge on Binadhan-6.

Saha (2001) conducted a study and found that cosmopoliteness of the farmers had a significant relationship with their knowledge on improved practices of pineapple cultivation.

Sarker (2002) revealed that cosmopoliteness of the farmers was significantly related with their knowledge of and attitude towards BRRI Dhan 29 variety of rice.

Saha (2003) found that organizational participation of the farmers had a significant relationship with their knowledge in shrimp cultivation.

Hossain (2003) in his study found that cosmopoliteness of the farmers had positive and significant relationship with their knowledge on modern Boro rice cultivation practices at 0.01 level of probability.

Khan (2005) in his study found that the cosmopoliteness of the farmers had an insignificant and negative relationship with their knowledge in maize cultivation.

2.2.9 Credit received and knowledge

Hossain (1981) conducted a study to determine the relationship of selected characteristics of jute growers with their adoption of improved practices of jute cultivation in Suti Union of Tangail district. He found a significant relationship between credit availability and adoption of improved farm practices. However, Reddy and Kivlin (1960) from a study of three villages concluded that credit availability was not significantly related to adoption of HYV.

Haque (1984) conducted a study on the adoption of improved practices areas of Jessore district and found significant positive relationship between credit availability and adoption of improved cane cultivation technologies.

Hussein (2001) conducted a study on farmers' knowledge and adoption of modern sugarcane cultivation practices and found a significant relationship between credit availability and their knowledge.

2.2.10 Attitude and knowledge

Bari (2000) conducted that agricultural knowledge of rice growers had no significant relationship with their attitude towards hybrid rice Alok 6201.

Sarker (2002) found that the knowledge of the World Vision farmers had significant positive relationship with their attitude organic homestead gardening practices.

2.2.11 Problem faced and knowledge

Sarker (2002) showed that there was a negative significant relationship between poultry knowledge of the farmers and their poultry problem faced in marketing.

Raha (1989) reported from his study that farmers' knowledge in irrigated modern boro paddy had no significant relationship with their irrigation problem faced. Islam (2001) found similar in their respective studies.

The study of Ali (1999) revealed that knowledge of the rural youth had significant positive relationship with their anticipated problem faced in self-employment by undertaking selected agricultural income-generating activities.

2.3 Conceptual Framework

The scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research while constructed properly consists at least two important elements i.e.: a dependent variable" and "an independent variable." A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variables (Townsend, 1953). An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed

phenomenon. Variables together are the causes and the phenomenon is effect and thus, there is cause effect relationship everywhere in the universe.

The conceptual framework of Rosenberg and Hovland (1960) was kept in mind while making structural arrangements for the dependent and independent variables. This study is concerned with the knowledge of the farmers towards prawn culture. Thus, the knowledge of the farmers towards prawn culture was the dependent variable and 11 selected characteristics of the farmers were considered as the independent variables. Knowledge of an individual may be affected through interacting forces of many independent variables. It is not possible to deal with all independent variables in a single study. It was therefore, necessary to limit the independent variables, which include age, education, family size, duration of involvement with prawn culture, farm size, annual income, training experience, extension media contact, cosmopoliteness, credit availability, attitude of the farmers towards prawn culture and problems faced by the farmers.

In the light of the abovementioned discussion, a conceptual framework has been developed for this study, which is diagrammatically presented in the Figure 2.1.

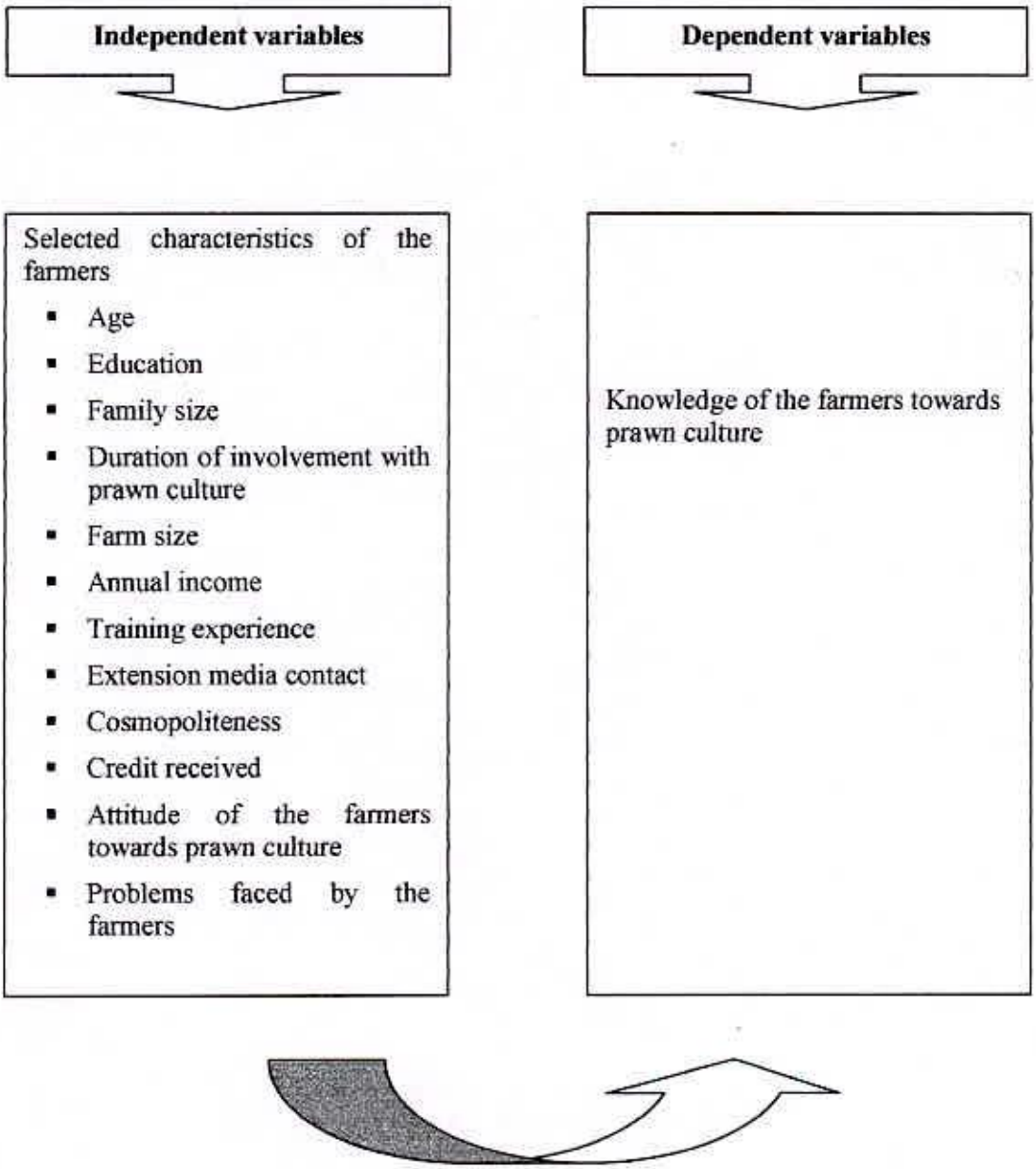

Figure 2.1 The conceptual framework of the study

Chapter III

METHODOLOGY

Methodology would be enabling the researcher to collect valid information. Without proper methodology, it is impossible to conduct research work smoothly and it is very difficult to address the objectives with a scientific and specific manner. It requires a very careful consideration on the part of the researcher to collect valid and reliable data and to analyze the same for meaningful conclusion. A sequential description of the methodologies followed in conducting this research work has been presented in this chapter.

3.1 Location of the study

The study was conducted in the Dumuria Upazilla under Khulna district. This upazilla is situated 35 km west from Khulna districts head quarters. Among the 11 union of Dumuria upazilla number 8 Sorafpur union was selected purposively as the locale of the study area. Then three (3) villages namely Sorafpur, Senpara and Kalikapur from number 8 Sorafpur union have been selected purposively as study area. Maps of Dumuria upazila and Khulna district showing the study area are presented in Figures 3.1 and 3.2, respectively.

3.2 Sample size

All prawn farmers of Dehergati union under Dumaria upazilla constituted the population of the study. An update list of 428 prawn farmers from the selected villages was prepared with the help of fisheries department. Twenty (25%) percent of the population were randomly selected as the sample of the study by

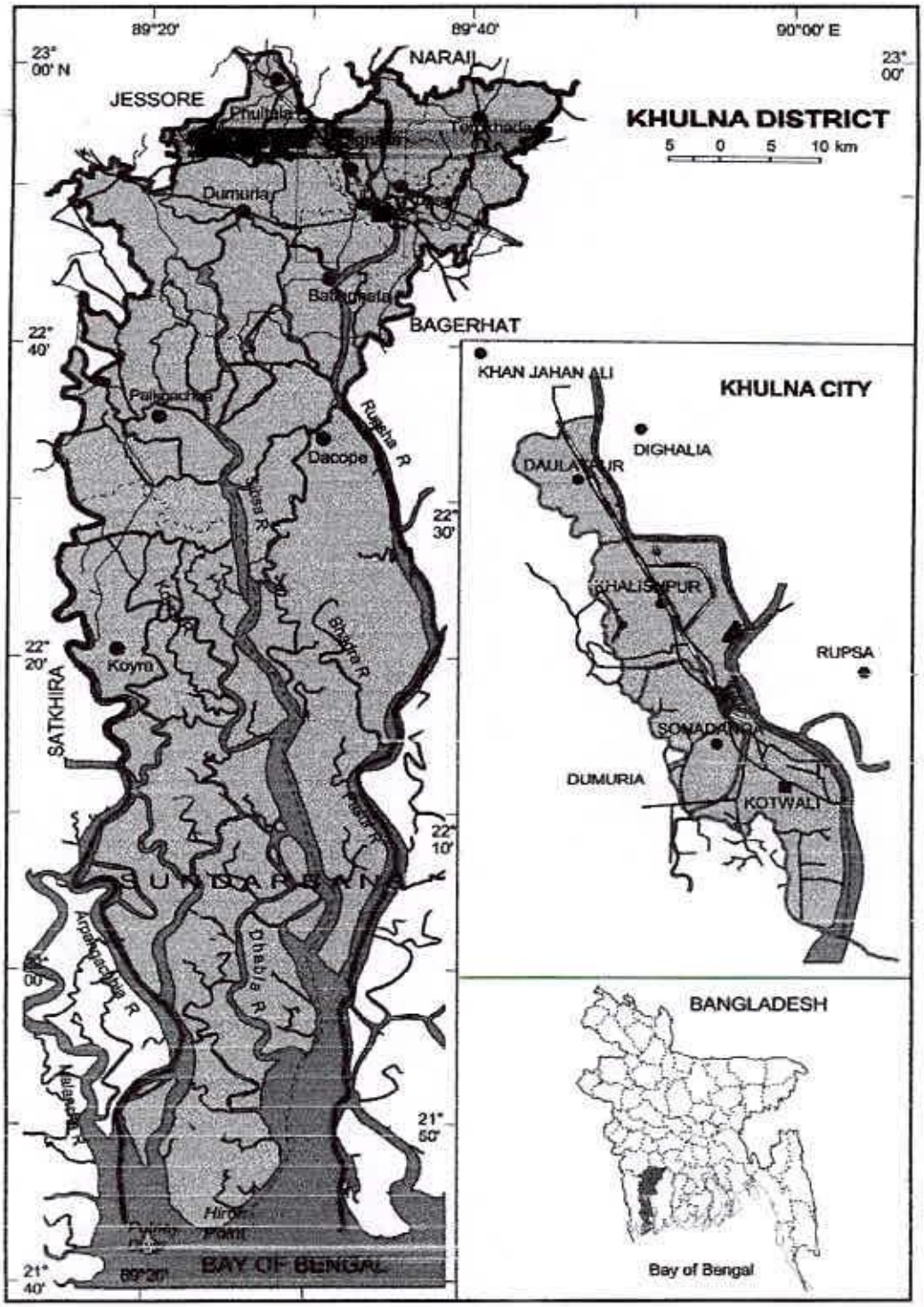

Figure 3.1 A map of Khulna District

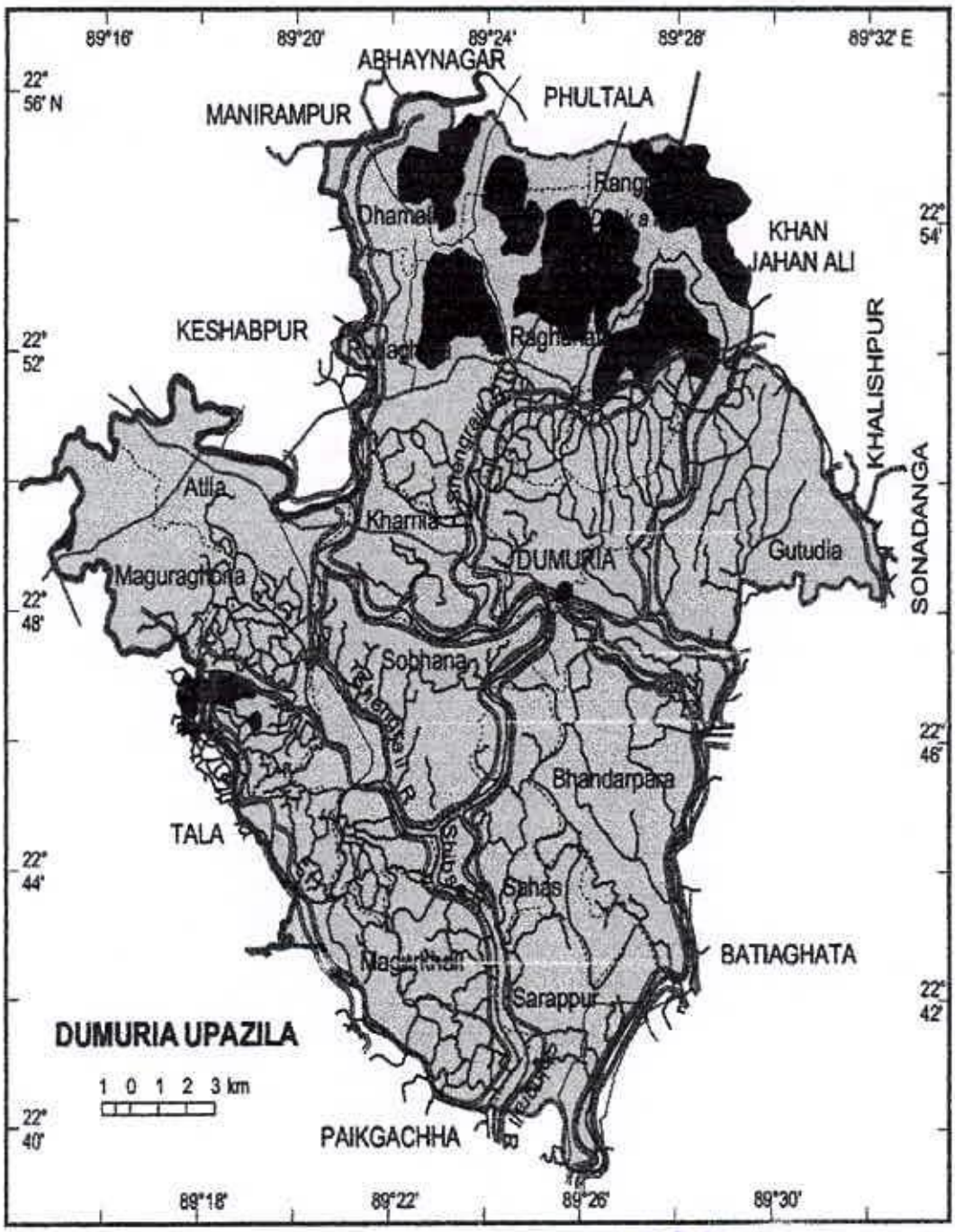

Figure 3.2 A map of Dumuria Upazilla

using random number table. Thus, 105 farmers constituted the sample of the study. A reserve list of fourteen farmers was also prepared by the same method so that the respondents of this list could be used for interview if the respondents included in the original sample were not available at the time of data collection. The distribution of the population sample and number of farmers in the reserve list are shown below-

Table 3.1 Distribution of the population sample and number of farmers in the reserve list

Name of the unions	Name of the of villages	No. of prawn farmers	No. of prawn farmers included in the sample	No. of prawn farmers in the reserve list
Dehergoti	Alonia	155	38	5
	Kazirpur	120	30	4
	Atilpara	153	37	5
Total		428	105	14

3.3 The Research Instrument

A well structured interview schedule was developed based on objectives of the study for collecting information. The interview schedule was constructed containing direct and simple questions in open form and close form keeping view the dependent and independent variables. Appropriate scales were developed to measure both independent and dependent variables.

The questionnaire was pre-tested with ten prawn farmers in actual situation before finalized it for collection of data. Necessary corrections, additions, alternations, rearrangements and adjustments were made in the interview schedule based on pretest experience. The questionnaire was then multiplied by printing in its final form. A copy of the interview schedule is presented into Appendix-I.

3.4 Data Collection Procedure

The researcher himself collected the data from the sample respondents through personal contact. Whenever any respondent faced difficulty in understanding questions, more attention was taken to explain the same with a view to enabling the farmers to answer properly. No serious problem was faced by the investigator during data collection but obtained cooperation from the respondents. Data collection was started on 1 May, 2008 and completed on 30 May, 2008.

3.5 Measurement of variables

The variable is any characteristic, which can assume varying, or different values in successive individual cases (Ezekiel and Fox, 1959). A research work usually contains at least two important variables viz. independent and dependent variable. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variable (Townsend, 1953). In the scientific research, the selection and measurement of variable constitute a significant task. In this conception, the researcher reviewed literature to widen this understanding about the natures and scopes of the variables relevant in this research. He also discussed with Departmental teacher and concerned researchers of the related fields. At last he had selected 12 independent variables and one dependent variable. The independent variables were: age, education, family size, duration of involvement with prawn culture, farm size, annual income, training experience, extension media contact, cosmopoliteness, credit availability, attitude

of the farmers towards prawn culture and problems faced by the farmers. The dependent variable of this study was knowledge of the farmers towards prawn culture. The methods and procedures in measuring these variables are presented

3.6 Measurement of independent variables

The 12 characteristics of the respondents farmers mentioned above constitute the independent variables of this study. The following procedures were followed for measuring the independent variables.

3.6.1 Age

Age of a respondent was measured by the period of time from their birth to the time of interview and it was measured in terms of complete years on the basis of their response. A score of one (1) was assigned for each year age.

3.6.2 Education

Education was measured in terms of grades (class) passed by respondent. If a respondent received education outside the school, their education was assessed in terms of education of the school, i. e. one (1) score was given for one year of schooling. For example, if the respondent passed the final examination of class V, their education score was taken as 5. If the respondent had education out side school and the level of education was equivalent to that of class V of the school than his education score was taken as 5. Each illiterate person was given a score of zero. The respondent who did not know how to read or write but able to sign only was given a score of "0.5"

3.6.3 Family size

The family size of a respondent was measured in terms of actual number of members in his family including himself, his wife, children, brothers, sisters, parents and other person who jointly live and ate together during interviewing.

3.6.4 Duration of involvement with prawn culture

Duration of involvement with prawn culture means the total years of respondents farmers were engaged with prawn culture. It was expressed in years and score of one (1) was assigned for each year involvement.

3.6.5 Farm size

Farm size of respondent farmers refered to the total area of land on which his family carried out farming operation, the area being in terms of full benefit his family. It was measured in hectares for each respondent using the following formula;

FS= A+B+C-D+E+F+G+H

Where,

FS = Farm size

A = Homestead area

B = Own land under own cultivation

C = Own land given to others as lease

D = Land taken as lease from others

E = Pond

F = Garden

G = Fallow land

H = Others

3.6.6 Annual income

The term annual family income refers to the annual gross income of a respondent himself and the members of his family from different sources. It was expressed in taka. In measuring these variables, total earning in taka of an individual respondent was converted into score. A score of one was given for every one thousand taka.

The method of ascertaining income form agriculture involved three phases. Firstly, the yield of all crops in the preceding year was noted. Secondly, income from livestock and fisheries. Thirdly, non-agricultural sources of income included earning form service, business and other sources.

3.6.7 Training experience

Agricultural training experience was operationalized by the total number of days a respondent attended in various training courses offered during his life time.

3.6.8 Extension media contact

Extension media contact was computed on the basis of the extent of contact of a respondent in 10 selected information sources. Scores was therefore assigned in the following manner in order to measure the extension media contact.

Scores assigned for a respondent's farmers in respect of extension media contact were as follows:

Extent of contact	Scores
Not at all	0
Rarely	1
Occasionally	2
Frequently	3

Extension media contact of the respondent was measured by adding the scores of 10 selected information sources. The extension contact score could range from 0-30, where 0 indicate no extension media contact and 30 indicated maximum extension media contact.

3.6.9 Cosmopoliteness

Cosmopoliteness score was computed for each respondent to determine his degree of cosmopoliteness on the basis of his visits to eleven different types of places external to his own social system. The scale used for computing the cosmopoliteness scores is presented below:

Extent of visit	Scores
Not at all	0
Rarely	1
Occasionally	2
Frequently	3

Scores obtained for visits to each of the above eight categories of places were added together to get the cosmopoliteness score of a respondent. Cosmopoliteness score of an individual could range from 0 to 24 where 0 indicated no cosmopoliteness and 24 indicated very high cosmopoliteness.

3.6.10 Credit received

Credit received of shrimp farmers refers to the amount of money received by him as loan from the different mentioned sources. Total credit received was calculated by adding the entire received amount from different sources.

3.6.11 Attitude towards prawn culture

Attitude of farmers towards prawn culture was measured through a Likert (1932) scale. Ten statements on various aspects of prawn culture were asked to the farmers. The number of positive items was equal to the number of negative items. The positive and negative items were arranged randomly in the schedule in order to achieve the real picture of attitude of the farmers. They were asked to indicate for each of the statements, whether they "strongly agree", "agree", "undecided', "disagree" and "strongly disagree" with a corresponding score 2, 1, 0, -1 and -2, respectively. The attitude score of a farmer was compared by summing the scores for his responses to all the items. Hence, scores of the farmers could range from -20 to + 20; -20 indicating highly negative attitude and +20 indicate highly favorable attitudes towards prawn culture.

3.6.12 Problem faced by the prawn farmers

Seven problems were selected to measure problems faced by the respondents on prawn culture. A four point rating scale was used for each problem. Four alternative responses were not at all, low, medium and high problem, the weights were assigned to these responses as 0, 1, 2, and 3 respectively. Problem faced score of a respondent was measured by summing of all the responses to all the

problems. Thus problem faced score could range from 0 to 21 while zero (0) indicating no problem and 21 indicating high problem faced.

3.7 Measurement of dependent variable

Knowledge of the farmers towards prawn culture was the dependent variable of this study. The procedure for measuring the dependent variable was as follows:

Knowledge of the farmers towards prawn culture

Knowledge of the farmers towards prawn culture was measured on the basis of 5 main basic heading each included in 5 statements each statements contains 3 marks.

Knowledge of the farmers towards prawn culture of a respondent was determined by summing up the weights for their responses to all the 5 area with 5 statements. Thus knowledge of the farmers towards prawn culture score of the respondents could range from 0 to 75, where zero (0) indicating no knowledge and 75 indicate sound knowledge.

3.8 Hypothesis of the study

Goode and Hatt (1952) defined hypothesis as "proposition which can be put to a test to determine its validity". It may prove to be correct or incorrect in any event, however, it leads to empirical test. In the present study the following null hypotheses were formulated:

"There are no relationships between 12 selected characteristics of the farmers and knowledge towards prawn culture".

3.9 Collection of data

The investigator himself collected data on the basis of objectives to test the hypothesis.

3.10 Data processing

For data processing and analysis the following steps followed:

3.10.1 Compilation of data

After completion of field survey all the interview schedule were compiled, tabulated and analyzed according to the objectives of the study. In this process all the responses in the interview schedule were given numerical coded values. The responses to the question in the interview schedule were transferred to a master sheet to facilitate tabulation. Tabulation was done on the basis of categories developed by the investigator himself.

3.10.2 Categorization of respondents

For describing the various independent and dependent variables the respondents were classified into various categories. In developing categories the researcher was guided by the nature of data and general consideration prevailing on the social system. The procedures have been discussed while describing the variable in the sub-sequent sections of next chapter.

3.11 Data analysis

Data collected from the respondents were complied, coded, tabulated and analyzed in accordance with the objectives of the study. Various statistical

measures such as frequency counts, percentage distribution, average, and standard deviation were used in describing data. SPSS (version 11.5) computer program were used for analyzing the data. The categories and tables were used in describing data. The categories and tables were also used in presenting data for better understanding.

For determining the association of the selected characteristics of the farmers with the knowledge of the farmers towards prawn culture Pearson Product Moment Correlation was used. Five percent (0.05) and one percent (0.01) level of probability was used as the basis for rejecting any null hypothesis. In order to find out the relationship between the selected dependent and independent variables correlation co-efficient was done.

Chapter IV

RESULTS AND DISCUSSION

This chapter deals with the findings that were recorded in accordance with the objective of the study with the help of an interview schedule with interpretation. The chapter content in three (3) sections. The first section deals with the characteristics of the farmers. The second section deals with the knowledge of the farmers towards prawn culture. The third section deals with the relationship between individual characteristics of the farmers with their knowledge towards prawn culture.

4.1 Characteristics of the farmers

An individual possesses various interrelated characteristics of the farmers were collected under the present study. It was therefore, hypothesized that the characteristics of the farmers would have an effect on knowledge of the farmers towards prawn culture. However, the 12 selected salient features of the farmers such as age, education, family size, duration of involvement with prawn culture, farm size, annual income, training experience, extension media contact, cosmopoliteness, credit received, attitude of the farmers towards prawn culture and problems faced by the farmers that greatly influences on knowledge of the farmers towards prawn culture that are presented below-

4.1.1 Age

The age of the farmers ranged from 23 to 63 with a mean and standard deviation of 41.24 and 9.867 respectively. Considering the observed age of the farmers who

were involved in prawn culture they were classified into three categories namely 'young', 'middle' and 'old' aged. The distribution on accordance of their age the respondents' farmers are presented in Table 4.1.

Table 4.1 Distribution of the farmers according to their age

Categories	Number of respondents	Percent	Mean	Standard deviation
Young aged (below 35 years)	31	29.52	41.24	9.867
Middle aged (35-50 years)	64	60.96		
Old aged (above 50 years)	10	9.52		
Total	105	100		

Table 4.1 indicates that the middle aged farmers constitute the highest proportion (60.96 percent) followed by young aged category (29.52 percent) and the lowest proportion were made by the old aged category (9.52 percent). Data also indicates that the young and middle aged farmers constitute about 91.48 of the respondents.

The younger and middle aged farmers generally tend to involved in prawn culture than the older. Generally, it could be said, Khulna district is one of the prawn culture area of Bangladesh. The age distribution of this area influences the prawn production in Bangladesh. Because young and middle age group people are more innovative and also carry risk bearing ability than the older. As the younger seems to more energetic, innovative and consider all things in economical point of view. Generally a young and middle aged person completed all the task of prawn production effectively and timely in order to prevent diseases and ensures all of the condition for attaining with more and appropriate prawn production.

4.1.2 Education level

The educational scores of the respondent's farmer ranged from 0 to 14 with a mean and standard deviation of 6.486 and 4.505 respectively. Based on their educational scores, the farmers were classified into five categories such as 'illiterate' (0), 'can sign name only' (0.5), 'primary education' (1 to 5), 'secondary education' (6 to 10), higher secondary and above (above 11). The distribution of the farmers according to their level of education has been presented in Table 4.2.

Table 4.2 Distribution of the farmers according to their education

Categories	Number of respondents	Percent	Mean	Standard deviation
Illiterate (0)	12	11.43	6.486	4.505
Can sign only (0.05)	14	13.33		
Primary education (1-5)	16	15.24		
Secondary education (6-10)	44	41.90		
Above secondary (above 10)	19	18.10		
Total	105	100		

Table 4.2 shows that farmers under 'secondary education category constitute the highest proportion (41.90 percent) compared to 18.10 percent above 'secondary level category and 15.24 percent primary level category. On the other hand the lowest 11.43 percent were illiterate followed by 13.33 percent can sign only. Education broadens the horizon of outlook of farmers and expands their capability to analyze any situation related to production. It was found that appreciable proportions (57.14 percent) of the farmers were under primary to secondary level

educated. The situation might appear to be appreciable in a usual background of Bangladesh.

An educated farmers is likely to be more responsive to the modern facts, ideas, technology and information of prawn culture. To adjust with the same, they would be vulnerable to adopt as well as involve with modern cultural, processing and storage facilities. About 90 percent respondents were educated in Damuria upazilla. This is the exceptional situation in Bangladesh. This is why the prawn production rate is higher in Dumuria upazilla district than the other upazilla of Bangladesh. The educated farmers can face the problems positively and they are able to adjust with the problem.

4.1.3 Family Size

Family size of the respondents ranged from 2 to 12 with a mean and standard deviation of 5.23 and 2.543 respectively. According to family size, the respondents were classified into three categories viz. 'small family', 'medium family' and 'large family' on the basis of their observed scores. The distribution of the farmers according to family size categories has been presented in Table 4.3.

Table 4.3 Distribution of the farmers according to their family size

Categories	No. of respondents	Percent	Mean	Standard deviation
Small size family (below 4)	47	44.76	5.23	2.543
Medium size family (5-8)	43	40.95		
Large size family (above 8)	15	14.29		
Total	105	100.0		

Data in Table 4.3 indicates that the small family category constitute the highest proportion (44.76 percent) followed by medium size family category (40.95 percent) and large family category (14.29 percent). Such finding is quite normal as per Bangladesh situation. Table 4.3 also showed that average family size of the respondent's rural women was lower than that of national average of 5.4 (BBS, 2005).

4.1.4 Duration of involvement with prawn culture

Duration of involvement with prawn culture was expressed in the length of year and has been presented in Table 4.4. The findings at Table 4.4 indicate that about 29.52% respondents were engaged with prawn culture below 10 years and 49.52% respondents were involved in 11-20 years and 20.96 percent above 21 years with their average duration 14.70 years and standard deviation 6.761 and the ranged of the prawn culture involvement was above 20 years.

Table 4.4 Distribution of the farmers according to their duration of involvement with prawn culture

Categories	No. of respondents	Percent	Mean	Standard deviation
Low involvement (below 10 years)	31	29.52	14.70	6.761
Medium involvement (11-20 years)	52	49.52		
High involvement (above 21 years)	22	20.96		
Total	105	100.0		

Duration of the prawn culture involvement indicated that how much time they closely spent with prawn culture. Long time involvement is more effective than the short time involvement in prawn culture.

4.1.5 Farm size

The farm size of the respondent's farmers family ranged from 0.125 hectare to 2.950 hectare with a mean and standard deviation of 0.958 and 0.699, respectively. Based on their farm size, the respondents were classified into four categories following the categorization followed by DAE (1999). These categories were marginal farm holder (below 0.2 ha), small farm holder (0.201 to 1.0 ha), medium farm holder (1.01 to 2.0 ha) and large farm holder (above 2.0 ha. The distribution of the farmers according to their family farm size categories has been presented in Table 4.5.

Table 4.5 indicates that the small farm holder constitute the highest proportion 54.29 percent followed by 31.43 percent with medium farm holder and the lowest 2.86 percent marginal farm holder and followed by 11.43 percent large farmers. The findings of the study reveal that majority of the prawn farmers family were small to medium sized farm holder. The average farm size of the rural farmers family of 0.958 hectares was higher than that of national average of 0.81 hectares in Bangladesh (BBS, 2005).

Table 4.5 Distribution of the farmers according to their farm size

Categories	No. of respondents	Percent	Mean	Standard deviation
Marginal (0.02-0.2 ha)	3	2.86	0.958	0.699
Small (0.21-1.0 ha)	57	54.29		
Medium (1.01-2 ha)	33	31.43		
Large (above 2.0 ha)	12	11.43		
Total	105	100.0		

4.1.6 Annual Family Income

Annual family income of the respondents ranged from 30,000 to 260,000 taka with a mean and standard deviation of 104.73 and 50.04, respectively. On the basis of their annual family income, the farmers' family was classified into three categories, such as low, medium and high family income. The distribution of the farmers according to the annual family income categories has been presented in Table 4.6.

Table 4.6 Distribution of the farmers according to their annual family income

Categories	No. of respondents	Percent	Mean	Standard deviation
Low income (below 80000)	43	40.95	104.73	50.04
Medium income (80000-160000)	53	50.48		
High income (above 160000)	9	8.57		
Total	105	100.0		

Data in table 4.6 revealed that the farmers family having medium income constitute the highest proportion (50.48 percent) followed by the farmers family having low annual family income (40.95 percent) and high annual family income (8.57 percent). Income of an individual allows him to invest more in prawn culture as well as taking risks involved in adoption of new technologies.

4.7 Training duration

The farmers received training on the various aspects of prawn culture and other income generating activities. Findings in respect of training received by the farmers have been presented in Tables 4.7. Data in the Table 4.7 revealed that all the farmers received training from any type of sources. But the duration of

training received by the farmers ranged from 3 to 12 days with the mean of 6.30 days and standard deviation 4.135. About 34.29 percent of the farmers received low duration training, 32.38 percent received medium duration training and 33.33 percent in long duration training.

Table 4.7 Distribution of the farmers according to their training duration

Categories	No. of respondents	Percent	Mean	Standard deviation
Low duration (below 4 days)	36	34.29	6.30	4.135
Medium duration (4-8 days)	34	32.38		
High duration (above 8 days)	35	33.33		
Total	105	100.0		

4.1.8 Extension media contact

The scores of extension media contact of the respondents ranged from 2 to 25 with an average of 10.56 and standard deviation of 6.355. Based on the observed individual scores, the respondents were classified into the three categories i.e. low media contact, medium media contact and high media contact. The distribution has been shown in the Table 4.8

About (56.19 percent) of the respondents had low media contact while 36.19 percent had medium media contact and 7.62 percent had high media contact. The farmers media contact indicate that the respondents of the study area do not get sufficient information about the technological aspects because above fifty percent respondents stay in the group of low media contact group.

Table 4.8 Distribution of the farmers according to their extension media contact

Categories	No. of respondents	Percent	Mean	Standard deviation
Low media contact (below 10)	59	56.19	10.56	6.355
Medium media contact (10-20)	38	36.19		
High media contact (above 20)	8	7.62		
Total	105	100		

4.1.9 Cosmopoliteness

The cosmopoliteness of the respondent's farmers ranged from 3 to 24 with a mean and standard deviation of 12.46 and 5.735, respectively. Based on their cosmopoliteness score, the respondents were classified into three categories. These categories were low, medium and high. The distribution of the cosmopoliteness presented in Table 4.9.

Table 4.9. Distribution of the farmers according to their cosmopoliteness

Categories	Frequency	Percent	Mean	Standard deviation
Low cosmopoliteness (below 10)	42	40.0	12.46	5.735
Medium cosmopoliteness (10-20)	53	50.48		
High cosmopoliteness (Above 20)	10	9.52		
Total	105	100		

Table 4.9 indicates that the farmers have medium cosmopoliteness category constitute the highest proportion (50.48 percent) followed by low cosmopoliteness (40 percent) and high cosmopoliteness category (9.52 percent). Table 4.9 showed that the maximum percentage is the category of the group of low to medium cosmopoliteness group.

4.1.10 Credit received

The beneficiaries received credit from various sources. These were BRAC, ASA, commercial banks, village money lenders friends or relatives and other sources. Credit availability of farmers varied from 5 to 80 thousand. An average credit receiving of the farmers were 18.04 and standard deviation was 14.95 (Table 4.10).

Table 4.10. Distribution of the farmers according to their credit received

Categories	Frequency	Percent	Mean	Standard deviation
Low credit (below 15 thousand)	65	61.90	18.04	14.95
Medium credit (15-20 thousand)	29	27.62		
High credit (Above 20 thousand)	11	10.48		
Total	105	100		

Data in the Table reveal that 61.90 percent farmers received credit below Tk. 15 thousand, while 27.62 percent farmers received credit from medium (15-20 thousand) score credit receiver and 10.48 percent for the high (above 20 thousand) score credit receiver.

4.1.11 Attitude

Attitude score of the farmers ranged from 2 to 18 with a mean and standard deviation of 10.50 and 3.778, respectively. According to attitude the respondents were classified into three categories viz. 'Low attitude, 'medium attitude and 'high attitude on the basis of their observed scores. The distribution of the farmers according to attitude has been presented in Table 4.11.

Data in Table 4.11 indicates that the medium levels attitude constitutes the highest proportion (61.90 percent) followed by low level attitude (23.81 percent) and high level attitude (14.29 percent). Table 4.11 showed that the maximum farmers are the category of low to medium level attitude. More positive attitude could create opportunity for receiving improved technology and information. The farmers who have low and medium attitude the knowledge of the farmers towards prawn culture also low on the other hand who have high level attitude have adequate knowledge towards prawn culture.

Table 4.11 Distribution of the farmers according to their attitude

Categories	Number of respondents	Percent	Mean	Standard deviation
Low attitude (below 7)	25	23.81	10.50	3.778
Medium attitude (7-14)	65	61.90		
High attitude (above 14)	15	14.29		
Total	105	100		

4.1.12 Problem faced for prawn culture

Problem faced for prawn culture are an important factor for knowledge towards prawn culture of the farmers. Scores obtained on problem faced varied from 2 to 21. An average storage facilities scores of the farmers were 11.84 and standard deviation was 4.987 (Table 4.12).

Data in the Table 4.12 revealed that highest 44.76 percent farmers had medium level problem, while 35.24 percent farmers had low level problem and 20% farmers had high level problem.

Table 4.12 Distribution of the farmers according to their problem

Categories	Number of respondents	Percent	Mean	Standard deviation
Low level problem (below 8)	37	35.24	11.84	4.987
Medium level problem (8-16)	47	44.76		
High level problem (above 16)	21	20.0		
Total	105	100		

4.2 Dependent Variable

Knowledge of the farmers towards prawn culture of the farmers was measured on the basis of 5 areas with 5 statements for each area. Knowledge of the farmers towards prawn culture score of a respondent was determined by adding all the statements. Thus knowledge of the farmers towards prawn culture score zero (0) indicating no knowledge, upto 25 indicate low level knowledge, 25-45 indicate medium level knowledge and above 45 indicate sound knowledge towards prawn culture. The findings are presented in Table 4.13.

Table 4.13 Distribution of the farmers according to their knowledge towards prawn culture

Categories	Number of respondents	Percent	Mean	Standard deviation
Low level knowledge (below 25)	58	55.24	29.66	15.024
Medium level knowledge (25-45)	32	30.48		
Sound level knowledge (above 45)	15	14.28		
Total	105	100		

The average knowledge of the farmers towards prawn culture score was 29.66 with standard deviation 15.024 and range was 12-68 scores. Among the respondents the highest 55.24 percent prawn farmers belongs to the group of low

level knowledge group followed by 30.48 percent in medium level knowledge group and 14.29 percent in sound knowledge group. Among the respondent farmers total 85.72 percent respondents' farmers have low to medium level knowledge towards prawn culture.

4.3 Relationship of the selected characteristics of farmers with their knowledge towards prawn culture

Pearson Product Moment Correlation Co-efficient was computed in order to find out the extent of relationship between the dependent variable and independent variables. To reject or accept the null hypothesis at 0.05 or 0.01 level of probability was used. A statistically significant and non-significant relationship was observed when the computed value or "r" was greater or smaller than the tabulated value, respectively.

4.3.1 Relationship between age and knowledge of the farmers towards prawn culture

Relationship between age and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between age and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.208. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.208) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.05 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that age had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that age of the farmers was an important factor in knowledge of the farmers towards prawn culture and with the increases of age of the respondent's knowledge of the farmers towards prawn culture also increases.

Table 4.14. Pearson's Product Moment Co-efficient of correlation showing relationship between dependent (knowledge of the farmers towards prawn culture) and independent variables

Dependent variable	Independent variable	Value of co-efficient of correlation
Knowledge towards prawn culture	Age	0.208*
	Education level	0.495**
	Family size	0.125^{NS}
	Duration of involvement with prawn culture	0.204*
	Farm size	0.100^{NS}
	Annual income	0.569**
	Training experience	0.273**
	Extension media contact	0.679**
	Cosmopoliteness	0.309**
	Credit received	0.306**
	Attitude of the farmers towards prawn culture	0.437**
	Problems faced by the farmers	0.672**

** Correlation is significant at the 0.01 level;

* Correlation is significant at the 0.05 level

NS: Non significant

4.3.3 Relationship between family size and knowledge of the farmers towards prawn culture

Relationship between family size and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between family size and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.125. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.125) was found to be smaller than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was accepted.*
- *The relationship between the concerned variables was statistically non significant at 0.05 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that family size had non significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that family size of the farmers was not an important factor in knowledge of the farmers towards prawn culture and but with the increases of family size of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.2 Relationship between education level and knowledge of the farmers towards prawn culture

Relationship between education level and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between education level and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.495. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.495) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that education level had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that education level of the farmers was an important factor in knowledge of the farmers towards prawn culture and with the increases of education level of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.4 Relationship between duration of involvement with prawn culture and knowledge of the farmers towards prawn culture

Relationship between duration of involvement with prawn culture and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study.

The coefficient of correlation between duration of involvement with prawn culture and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.204. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.204) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.05 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that duration of involvement with prawn culture had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that duration of involvement with prawn culture of the farmers was an important factor and with the increases of duration of involvement with prawn culture of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.5 Relationship between farm size and knowledge of the farmers towards prawn culture

Relationship between farm size and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between farm size and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.100. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.100) was found to be smaller than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was accepted.*
- *The relationship between the concerned variables was statistically non significant at 0.05 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that farm size had non significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that farm size of the farmers was not an important factor in knowledge of the farmers towards prawn culture and but with the increases of farm size of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.6 Relationship between annual income and knowledge of the farmers towards prawn culture

Relationship between annual income and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between annual income and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.569. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.569) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that annual income had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that annual income of the farmers was an important factor in knowledge of the farmers towards prawn culture and with the increases of annual income of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.7 Relationship between training experience and knowledge of the farmers towards prawn culture

Relationship between training experience and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between training experience and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.273. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.273) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that training experience had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that training experience of the farmers was an important factor and with the increases of training experience of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.8 Relationship between extension media contact and knowledge of the farmers towards prawn culture

Relationship between extension media contact and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between extension media contact and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.679. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.679) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that extension media contact had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that extension media contact of the farmers was an important factor in knowledge of the farmers towards prawn culture and with the increases of extension media contact of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.9 Relationship between cosmopoliteness and knowledge of the farmers towards prawn culture

Relationship between cosmopoliteness and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between cosmopoliteness and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.309. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.309) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that cosmopoliteness had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that cosmopoliteness of the farmers was an important factor in knowledge of the farmers towards prawn culture and with the increases of cosmopoliteness of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.10 Relationship between credit received and knowledge of the farmers towards prawn culture

Relationship between credit received and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between credit received and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.306. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.306) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that credit received had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that credit received of the farmers was an important factor in knowledge of the farmers towards prawn culture and with the increases of credit received of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.11 Relationship between attitude of the farmers and their knowledge towards prawn culture

Relationship between attitude of the farmers towards prawn culture and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study.

The coefficient of correlation between attitude of the farmers towards prawn culture and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.437. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.437) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that attitude of the farmers towards prawn culture had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that attitude of the farmers towards prawn culture of the farmers was an important factor and with the increases of attitude of the farmers towards prawn culture of the respondent's knowledge of the farmers towards prawn culture also increases.

4.3.12 Relationship between problems faced by the farmers and their knowledge towards prawn culture

Relationship between problems faced by the farmers and knowledge of the farmers towards prawn culture was determined by the following Pearson Product Moment Correlation Co-efficient and level of significance at 0.05 and 0.01 was tested on the basis of the null hypothesis of the study that was stated earlier.

The coefficient of correlation between problems faced by the farmers and knowledge of the farmers towards prawn culture are presented in Table 4.14. The coefficient of correlation between the concerned variables was found 0.672. The following observations were made on the basis of the value of correlation coefficient between the two variables of the study.

- *The calculated value between the concerned variables "r" (0.672) was found to be greater than the tabulated value (r = 0.196) with 103 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that problems faced by the farmers had significant positive relationships with knowledge of the farmers towards prawn culture. This symbolize that problems faced by the farmers of the farmers was an important factor in knowledge of the farmers towards prawn culture and with the increases of problems faced by the farmers of the respondent's knowledge of the farmers towards prawn culture also increases.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The study was conducted in the Dumuria Upazilla under Khulna district. Three villages namely Sorafpur, Senpara and Kalikapur from number 8 Sorafpur union have been selected purposively for the study. A list of 428 prawn farmers from the selected villages was prepared with the help of fisheries department. Twenty (25%) percent of the population were randomly selected as the sample of the study by using random number table. Thus, 105 farmers constituted the sample of the study. A well structured interview schedule was developed based on objectives of the study for collecting information. The researcher himself collected data through personal contact. The independent variables were: age, education, family size, duration of involvement with prawn culture, farm size, annual income, training experience, extension media contact, cosmopoliteness, credit received, attitude of the farmers towards prawn culture and problems faced by the farmers. Data collection was started on 1 May, 2008 and completed on 30 May, 2008. Various statistical measures such as frequency counts, percentage distribution, average, and standard deviation were used in describing data. Co-efficient of correlation test was used to explore relationship between the concerned variables. The major findings of the study are summarized below:

5.1.1 Major Findings

Age

Among the respondents farmers the middle aged farmers constitute the highest proportion (60.96 percent) followed by young aged category (29.52 percent) and the lowest proportion were made by the old aged category (9.52 percent).

Education level

Farmers under 'secondary education category constitute the highest proportion (41.90 percent) compared to 18.10 percent above 'secondary level category and 15.24 percent primary level category. On the other hand the lowest 11.43 percent were illiterate followed by 13.33 percent can sign only.

Family Size

The small family category constitute the highest proportion (44.76 percent) followed by medium size family category (40.95 percent) and large family category (14.29 percent).

Duration of involvement with prawn culture

About 29.52% respondents were engaged with prawn culture below 10 years and 49.52% respondents were involved in 11-20 years and 22.95 percent above 21 years.

Farm size

Small farm holder constitute the highest proportion 54.29 percent followed by 31.43 percent with medium farm holder and the lowest 2.86 percent marginal farm holder and followed by 11.43 percent large farmers.

Annual Family Income

The farmers family having medium income constitute the highest proportion (50.48 percent) followed by the farmers family having low annual family income (40.95 percent) and high annual family income (8.57 percent).

Training duration

Among the total respondents about 34.29 percent of the farmers received low duration training, 32.38 percent received medium duration training and 33.33 percent in long duration training.

Extension media contact

About 56.19 percent of the respondents had low media contact while 36.19 percent had medium media contact and 7.62 percent had high media contact.

Cosmopoliteness

The farmers have medium cosmopoliteness category constitute the highest proportion (50.48 percent) followed by low cosmopoliteness (40 percent) and high cosmopoliteness category (9.52 percent).

Credit availability

Among the total respondents farmers about 61.90 percent farmers received credit upto Tk. 15 thousand, while 27.62 percent farmers received credit from medium (15-20 thousand) score credit receiver and 10.48 percent for the high (above 20 thousand) score credit receiver.

Attitude

The medium levels attitude constitutes the highest proportion (61.90 percent) followed by low level attitude (23.81 percent) and high level attitude (14.29 percent).

Problem faced for prawn culture

The highest 44.76 percent farmers had medium level problem, while 35.24 percent farmers had low level problem and 20% farmers had high level problem.

Knowledge towards prawn culture

The average knowledge of the farmers towards prawn culture score was 29.66 with standard deviation 15.024 and range was 12-68 scores. Among the respondents the highest 55.24 percent prawn farmers belongs to the group of low level knowledge group followed by 30.48 percent in medium level knowledge group and 14.29 percent in sound knowledge group.

Hypothesis testing

- Age had significant positive relationships with knowledge of the farmers towards prawn culture.
- Education level had significant positive relationships with knowledge of the farmers towards prawn culture.
- Duration of involvement with prawn culture had significant positive relationships with knowledge of the farmers towards prawn culture.
- Farm size had non significant positive relationships with knowledge of the farmers towards prawn culture.
- Annual income had significant positive relationships with knowledge of the farmers towards prawn culture.
- Training experience had significant positive relationships with knowledge of the farmers towards prawn culture.

- Extension media contact had significant positive relationships with knowledge of the farmers towards prawn culture.
- Cosmopoliteness had significant positive relationships with knowledge of the farmers towards prawn culture.
- Credit received had significant positive relationships with knowledge of the farmers towards prawn culture.
- Attitude of the farmers towards prawn culture had significant positive relationships with knowledge of the farmers towards prawn culture.
- Problems faced by the farmers had significant positive relationships with knowledge of the farmers towards prawn culture.

5.2 Conclusions

1. The findings indicate that among the respondents that about 85 percent respondents farmers belongs to the group of low to medium knowledge on prawn culture. This fact leads to the conclusion that it is necessary to increases the knowledge level of the respondents' farmers towards prawn culture.

2. Education level had significant positive relationships with knowledge of the farmers towards prawn culture. Among the respondents farmers about 50 percent stays below the group of secondary level education. Education has an effect of widening the horizon of knowledge. All these facts lead to the conclusion that higher level of education of the respondents could increase their knowledge on prawn culture.

3. Duration of involvement with prawn culture had significant positive relationships with knowledge of the farmers towards prawn culture. Long duration involvement

with prawn culture leads to facing problems and management practices. So long duration involvement with prawn culture helps to increase sound knowledge on prawn culture.

4. Farm size had positive non significant relationship with knowledge of the farmers towards prawn culture. Small farmers constitute the highest proportion that is around 50 percent respondents were small farmers. Increase of farm size of the respondents' farmers leads to more involvement with prawn culture and finally increases their level of knowledge.

5. Farmers annual income had positive significant relationship with knowledge of the farmers towards prawn culture. But, majority (about 92 percent) of the respondent's farmers had low to medium annual family income. Above facts leads to the conclusion that higher annual family income of the farmer's increase level of sound knowledge towards prawn culture.

6. Duration of farmers training had positive significant relationship with knowledge of the farmers towards prawn culture. Among the respondents about two third of the farmers received short to medium duration training. If enough training would be provided for the prawn farmers that help to developed their level of knowledge.

7. Extension media contact had positive significant relationship with knowledge of the farmers towards prawn culture. Again, an overwhelming majority (93 percent) of the respondents had low to low medium extension media contact. These facts lead to the conclusion that higher extension media contact of the farmers could increased their knowledge towards prawn culture.

8. Cosmopoliteness had positive significant relationship with knowledge of the farmers towards prawn culture. But most (91 percent) of the respondents had low to medium cosmopoliteness. Therefore, it may be concluded that higher cosmopoliteness of the respondents could increase their knowledge towards prawn culture.

9. Credit received had positive significant relationship with knowledge of the farmers towards prawn culture. Among the total respondents farmers about 90 percent farmers received low to medium amount of credit. With considerable amount of credit the prawn farmers can easily developed their knowledge. Therefore, it may be concluded that considerable amount of credit received of the respondents could increase their knowledge towards prawn culture.

10. Attitude had positive significant relationship with knowledge of the farmers towards prawn culture. Among the respondents about 85 percent have low to medium levels attitude. With increases the level of attitude that leads to increase knowledge of the respondents' farmer.

5.3 Recommendations

5.3.1 Recommendations for policy implications

Recommendations formulated on the basis of experience, observation and conclusions drawn from the findings of the study and have been prescribed to the concerned authorities, planners and executioners are given below:

1. Among the respondents about 85 percent respondents' farmers belongs to the group of low to medium knowledge on prawn culture. So, it is necessary to increases the knowledge level towards prawn culture.

2. Education level had significant positive relationships with knowledge of the farmers towards prawn culture. So, it is necessary to increase the level of knowledge of the respondents.

3. Farmers annual income had positive significant relationship with knowledge of the farmers towards prawn culture. It is necessary to increase annual family income of the farmer's for increasing level of sound knowledge towards prawn culture.

4. Duration of farmers training had positive significant relationship with knowledge of the farmers towards prawn culture. Therefore, it may be recommended that arrangement of frequent and effective training for the farmers.

5. Extension media contact had positive significant relationship with knowledge of the farmers towards prawn culture. Therefore, it is necessary to available this service near to the farmers

6. Cosmopoliteness had positive significant relationship with knowledge of the farmers towards prawn culture. Therefore, it is necessary to increase the farmer's cosmopoliteness.

7. Credit received had positive significant relationship with knowledge of the farmers towards prawn culture. Therefore, it is necessary to increase the source of credit and the condition of receiving credit.

8. Attitude had positive significant relationship with knowledge of the farmers towards prawn culture. Proper steps should be taken for increasing the level of attitude of the respondents' farmers.

5.3.2 Recommendations for further study

On the basis of scope and limitations of the present study and observation made by the researcher, the following recommendations are made for future study.

1. Other factors might have influence on knowledge towards prawn culture of the farmers, which needs to be identified by further study.

2. This study was conducted in Dumuria Upazilla under Khulna District. Similar studies are required to be conducted in other sites of the coastal area of Bangladesh where similar environmental, socio-economic and physical conditions exist to compare the findings.

3. The study investigated the direct and indirect effects of some variables. Future studies should be conducted to explore the direct and indirect effects of all the variables under investigation.

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APPENDICES

Appendix I. Interview Schedule

DEPARTMENT OF AGRICULTURAL EXTENSION AND INFORMATION SYSTEM
SHER-E-BANGLA AGRICULTURAL UNIVERSITY
DHAKA 1207

An interview schedule for a research study entitle

"Knowledge of the Farmers on Prawn Culture in Specific Area of Khulna District"

Serial No.....

Respondent Name :

Village :

Union :

Upazila :

Please answer the following questions

1. Age: What is your present age? ..... Years

2. Education: What is the level of your education?

a) Illiterate: b. Can sign only c. Have passed class.....

3. Please mention the number of your family member

a. Male: b. Female:

4. Duration of involvement with shrimp culture

How long you are involve in shrimp culture?..... Years

5. Farm size (Please mention your farm size)

Sl. No.	Types of land	Land area	
		Local Unit	Hectares
1	Homestead area		
2	Own land under own cultivation		
3	Own land given to others as lease		
4	Land taken as lease from others		
5	Pond		
6	Garden		
7	Fallow land		
8	Others		
Total			

6. Annual income (Please state the income of your family during last year)

a. Income from shrimp :.....Taka

b. Income from others :

	Sl. No.	Source of income	Total price (taka)
i. Agricultural income	1.	Field crops	
		a) Rice	
		b) Jute	
		c) Wheat	
		d) Pulse	
		e) Others	
	2.	Vegetables	
	3.	Fruits	
ii. Income from livestock and fisheries	1.	Livestock	
	2.	Poultry	
	3.	Fisheries	
iii. Non-agricultural source	1.	Service	
	2.	Business	
	3.	Others	
Total (i + ii + iii)			

7. Training experience (Have you participated any training program on shrimp culture?)

Yes...../ No..... (If yes, furnish the following information)

SL.	Name of training course	Organization	Day(s)
1			
2			
5			

8. Extension of media contact (Please indicate the extent of contact in following sources)

SL.	Name of information sources	Extent of contact			
		Frequently	Occasionally	Rarely	Not at all
1.	Fisheries officer	2 or more times/month	At least 1 time/month	1-5 times/years	
2.	Sub Assistant Agricultural officer (SAAO)	3 or more times/month	1-2 times/month	1-5 times/year	
3.	NGO worker	3 or more times/month	1-2 times/month	1-5 times/year	
4.	Input dealer	3 or more times/month	1-2 times/month	at least once a year	
5.	Participation in group meeting	3 times or more/month	1-2 times/month	At least once a year	
6.	Participation in demonstration	3 times or more/month	1-2 times/month	At least once a year	
7.	Relatives	3 times or more/month	1-2 times/month	At least once a year	
8.	Listening and watching agricultural program	4-7 days/week	1-3 days/week	1-3 days/month	
9.	Reading printed materials like leaflet, bulletin	1 piece/month	3-5 pieces/year	1-2 pieces/year	
10	Watching agricultural posters advertisements in newspaper	1 piece/month	3-5 pieces/year	1-2 pieces/year	

9. **Cosmopoliteness** (Please indicate the extent of visit in specific places in specific period)

SL.	Place of visit	Extent of visit			
		Frequently	Occasionally	Rarely	Not at al
1.	Other village	6 or more times/month	4-5 times/month	1-3/month	
2	Local Market	6 or more times/month	4-5 times/month	1-3/month	
3.	Own Union Parishad	5 or more times/month	3-4 times/month	1-2 times/year	
4.	Own Upazila headquarter	3 or more times/months	1-2 times/months	1-2 times/year	
5.	Other upazila(s)	2 or more/months	3-5 times/year	1-2 times/year	
6.	Own district town	5 or more times/year	3-4 times/year	1-2 times/year	
7.	Other districts(s)	3 or more times/year	2 times/year	One time/year	
8.	Capital	3 or more times in a life time	2 times in a life time	Once in a life time	

10. Credit availability (Had you taken any credit last year)? Yes.....No.....

Please mention sources of credit with its amount

SL.	Name of sources	Amount of credit	SL.		Amount of credit
1	Bank		2	NGOs	
3	Relatives/Friends		4	Money lenders	
5	Neighbour				
Total					

11. Attitude towards shrimp culture (Please mention the extent possible the following statements for yours?)

SL.	Statement	SA	A	UD	D	SD
1.	Shrimp culture is a very difficult work					
2.	Shrimp culture is a profitable business					
3.	The socio-economic conditions of the villagers are changing by shrimp culture					
4.	Natural disaster affects the shrimp farming					
5.	The environmental balance is being degraded by shrimp farming					
6.	To lease the land for fish farming is more profitable than rice cultivation					
7.	Success of shrimp farming is dependent on protection from pest and diseases					
8.	Success of shrimp farming depends on good transportation and processing system					
9.	Some dishonest traders are hampering the prospect of shrimp farming by penetrating sago mixed water					
10.	Theft, burglary and robbery are being increased day by day due to shrimp farming					

SA = Strongly Agree; A = Agree; UD = Undecided; D = Disagree and SD = Strongly Disagree

12. Problems (Please mention the extent of problem faced for shrimp culture)

SL.	Problems	Extent of problem			
		High	Medium	Low	Not at all
1.	High sensitivity to diseases of shrimp				
2.	Lack of training on shrimp culture				
3.	Non-availability of post-larvae in time				
4.	Price of post larvae and feed				
5.	Non-availability of credit in time				
6.	Lack of marketing facilities				
7.	Natural calamities				

13. Knowledge about prawn culture (Please answer the following questions)

a. Simple recall

SL.	Questions	Full marks	Marks obtained
1.	Please mention two ways of identifying prawn post-larvae	3	
2.	What is the suitable time of post larvae stocking?	3	
3.	What is rate of post larvae stocking per acre?	3	
4.	Please mention two prawn diseases.	3	
5.	Please mention two feeds of post larvae.	3	

b. Ability to understanding of ideas

SL.	Questions	Full marks	Marks obtained
1.	Please mention the necessity of canals in *gher.*	3	
2.	How way natural food make in *gher.*	3	
3.	What is the necessity of liming in *gher*?	3	
4.	What element is used in prawn feed?	3	
5.	Mention the necessity of removing the predator fish from *gher.*	3	

c. Abilities to apply knowledge and ideas

SL.	Question	Full marks	Marks obtained
1.	Ratio of prawn and carp culture in *gher* simultaneously.	3	
2.	What is the symptom of gass in gher soil?	3	
3.	What element used in balance feed?	3	
4.	In which way oxygen can be increases in *gher* water?	3	
5.	Please mention the way of liming in *gher*	3	

d. Ability to deal with existing situation or problems

SL.	Questions	Full marks	Marks obtained
1.	Mention the management for populated water in *gher.*	3	
2.	What management taken for standing water in *gher*	3	
3.	Please mention the way of removing viruses form the *gher*	3	
4.	What management step taken if excess feed applied in *gher*	3	
5.	Mention the necessity draw of net in *gher*	3	

e. Ability to judge the quality

SL.	Questions	Full marks	Marks obtained
1.	What is the cause of polluting water in *gher*?	3	
2.	What is the use of rice cultivation in *gher?*	3	
3.	Mention the size of prawn for marketing	3	
4.	What is the reason for increasing prawn culture this locality?	3	
5.	For what reason growth of prawn is stunted?	3	

Thanks for your co-operation

Signature of the interviewer with Date

Appendix II. Correlation Matrix

Characters	AGE	Education	Family size	Duration of involvement with prawn culture	Farm size	Annual Income	Training experience	Extension media contact	Cosmopoliteness	Credit received	Attitude	Problems	Knowledge
Age	1												
Education	0.026	1											
Family size	-0.041	0.094	1										
Duration of involvement with prawn culture	-0.029	-0.039	0.052	1									
Farm size	0.059	-0.234*	-0.087	0.076	1								
Annual Income	0.046	-0.108	0.003	0.137	0.711**	1							
Training experience	0.109	0.064	0.124	0.053	0.352**	0.341**	1						
Extension media contact	0.218*	0.002	0.088	0.079	0.498**	0.468**	0.608**	1					
Cosmopoliteness	0.282**	0.140	0.113	0.088	0.300**	0.384**	0.474**	0.696**	1				
Credit received	0.070	0.151	0.048	-0.017	-0.003	0.105	0.222*	0.375**	0.422**	1			
Attitude	0.104	0.157	0.075	0.013	-0.068	0.114	0.34(**	0.247*	0.178	0.207*	1		
Problems	0.181	0.334**	0.081	0.084	-0.018	0.130	0.299**	0.207*	0.292**	0.176	0.675**	1	
Knowledge	0.208*	0.295**	0.125	0.204*	0.100	.269**	0.273**	0.279**	0.309**	0.306**	0.437**	0.672**	1

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).