

**ATTITUDE OF FARMERS TOWARDS IMPROVED  
AGRICULTURAL IMPLEMENTS**

**BY**

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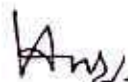
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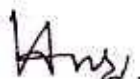
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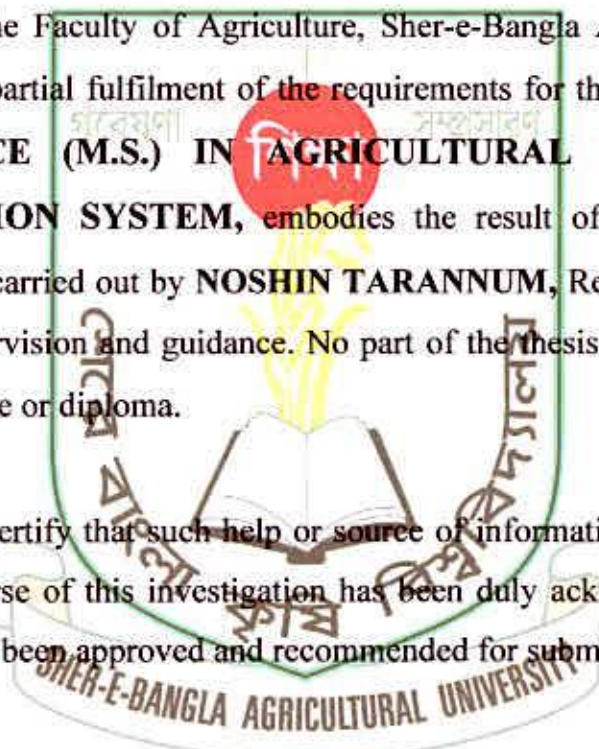
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## CERTIFICATE

This is to certify that the thesis entitled, “**ATTITUDE OF FARMERS TOWARDS IMPROVED AGRICULTURAL IMPLEMENTS**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in the partial fulfilment of the requirements for the degree of **MASTER OF SCIENCE (M.S.) IN AGRICULTURAL EXTENSION AND INFORMATION SYSTEM**, embodies the result of a piece of *bona fide* research work carried out by **NOSHIN TARANNUM**, Registration No. **06-1907** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that such help or source of information, as has been availed during the course of this investigation has been duly acknowledged and style of this thesis have been approved and recommended for submission.



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*Dedicated to  
My  
Beloved Parents*



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# ATTITUDE OF FARMERS TOWARDS IMPROVED AGRICULTURAL IMPLEMENTS

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## ABSTRACT

The purpose of the study was to determine the extent of attitude of farmers towards improved agricultural implements and to explore relationships between selected characteristics of the farmers with their attitude towards improved agricultural implements. Sadarb Upazila of Jamalpur District was the locale of the study. Data were collected from 120 farmers by using interview schedule during 01 March to 30 March 2013. Likert Scale was used for measuring the attitude towards improved agricultural implements of the farmers. The findings revealed that about half (50.8%) of the farmers had favorable attitude, 41.7 percent of them had unfavorable attitude and 7.5 percent had neutral attitude towards improved agricultural implements. It was found that above half (51.66%) of the farmers were old aged. About two-third (62.5%) of the respondents had education from primary to above secondary level. Most of them had small farm size (75.83%), low income (73.33%), high knowledge (33.33%), medium innovativeness (55%), medium social status (45%), medium opinion leadership (42.5%) and high interpersonal communication (58.33%). In exploring the relationship between attitude of farmers towards improved agricultural implements and their selected characteristics, it was found that age, knowledge about improved agricultural implements, innovativeness, social status, opinion leadership, and interpersonal communication of the farmers had significant positive relationships with their attitude towards improved agricultural implements. However, education, farm size, annual family income had no significant relationships.



**Chapter 1**  
**Introduction**

# CHAPTER I

## INTRODUCTION

### 1.1 Background of the Study

Agriculture is the main stay of economy of Bangladesh. To feed her 150 million people from 8.2 million hectares of cultivable land is a tough task ( Hossain, 2012). Every year almost 0.20 million people are being added to the total population where the estimated annual shrinkage of agricultural land is about 0.08 million hectares due to various non-agricultural activities like constructions of houses, offices, roads, mills, factories etc.(BRRI, 2009). The contribution to GDP by agriculture is about 18.70%, of which crops, livestock, fisheries, and forestry account for 10.25%, 2.45%, 4.37% and 1.63% respectively (BBS, 2012-13). The country's food production has increased from 11.0 million tons in 1971 to about 30 million tons in 2012 (Hossain, 2012). The country is at present , about to achieve self sufficiency in cereal production. This is due to irrigation development and partial mechanization in other agricultural operations. But to meet up the food requirements of the over growing population of the country in 2015, an additional 5 million tons of food grain need to be produced from the continuously decreasing agricultural lands.

Agriculture sector is the largest contributor to income generation as well. It accepted the challenge to achieve self sufficiency in food production and poverty alleviation. The Government has the responsibility to ensure that the necessary conditions exist to enable the country to meet these challenges, and for this purpose, a sound agricultural policy is essential. It is therefore, necessary to reorganize and develop the agricultural production system into a more dynamic





and commercially profitable sector. In this context, the primary goal of the National Agriculture Policy is to modernize and diversify the crop sector.

Agriculture is the heart of Bangladesh economy. But almost all the agricultural operations are found to be traditional and non-mechanized. The agricultural operations consist of ploughing, sowing/transplanting, manuring, weeding, spraying, harvesting, threshing, drying, storing etc. Although Bangladesh possesses traditional agriculture but some of the operations are mechanized such as ploughing, seeding, insecticide spraying, irrigation, transplanting etc. The Engineering Division of Bangladesh Agricultural Research Institute, Bangladesh Rice Research Institute have developed a good number of agricultural implements for making easy of some particular operations. The innovative farmers are using these implements. It is true that the development of agriculture is concerned with the successful use of these innovations. Many farmers rich or marginal use power tiller, tractor, weeder, harvester, power pump, seed drill, deep tube well etc. as a part of mechanization of agriculture.

Dennis and Jock (1998) reports that regardless of their source and economic status, farmers adopt new technologies and modify their attitudes when they believe that a proposed change is relevant to their circumstances and can help them to achieve their production objectives. An extension service can play an important role in increasing the rate of adoption of agricultural innovation that can enhance productivity and welfare of the users. In Bangladesh, so long farmers were concerned about only technologies of HYV of different crops . But since the last decade the process of farm mechanization was going in full swing by using various farm implements. The implements of farm mechanization are tractor, power tiller, seed drill, drum seeder, power operated maize thresher, paddle thresher, deep tubewell, shallow tube well, power pump and more. These implements enhance agricultural operations from cultivation to harvesting. As a

result Bangladesh has almost achieved self-sufficiency in food production. Ploughing and irrigation are now practically fully mechanized as more than one and half million diesel s and electric driven pumps lift ground and surface water. Recent survey reports that by 2010 about 80% of the land was ploughed by power tillers and tractors. A good progress of mechanization has also been made in weeding, and fertilizing activities. In the past women spend many hours processing rice with the foot operated “dheki” but today rice hullers and mills have taken over this task. Cost of tilling land with tillers is found to be economically advantageous due to higher cost of using animal power. Today about 35000 tractors are operating in agricultural sector but in 2002 the number was only 5,530 (FAO, 2002). In general improved agricultural implements has gained popularity among farmers for its multidimensional productivity and efficiency. It is crucial to disseminate the improved implements among the farmers. So the researcher is very much interested to conduct a research work on attitude towards the improved agricultural implements. The adoption of a technology like farm implements by a farm community depends on their attitudes and their characteristics on one hand and the attributes of farm implements on the other. The attributes of farm implements considered by farmers are relative advantages like reduced cost, no risk, high production, long last ,compatible, simple and easy operation. Attitude, in social psychology , is a predisposition to classify objects and events and to react them with some degree of evaluative consistency while attitude logically is a hypothetical constructs (i.e. they are inferred but not objectively observable), they are manifested in conscious experience, verbal reports, gross behavior and physiological symptoms. The concepts of attitude arises from attempt to account for observed regularities in the behavior of individual persons. The quality of one’s attitude judged from the observable, evaluative responses he trends to make. Attitude has also been defined as a



positive or negative feeling (or affect) associated with a psychological objects. The objects may be any symbol, phrase, slogan, person, institution, ideal or idea (Anon., 1965). Actions and behavior of individuals are to a large extent determined by their attitudes. Attitude has three components: a) The cognitive component of an attitude consists of the belief of the individual about the object. This may also be said as understanding, knowledge, and conception, b) The feeling or affective component with the object. The object in felt to be pleasing or displeasing it is liked or it is disliked, c) The action or behavioral component of an attitude includes all the behavioral readiness associated with the attitude. The term 'attitude formation is important within the individual in order to ensure more accurate prediction about their behavior and to have greater control over action. So, it is very necessary to know, about the types of attitudes of farmers toward improved agricultural implements.

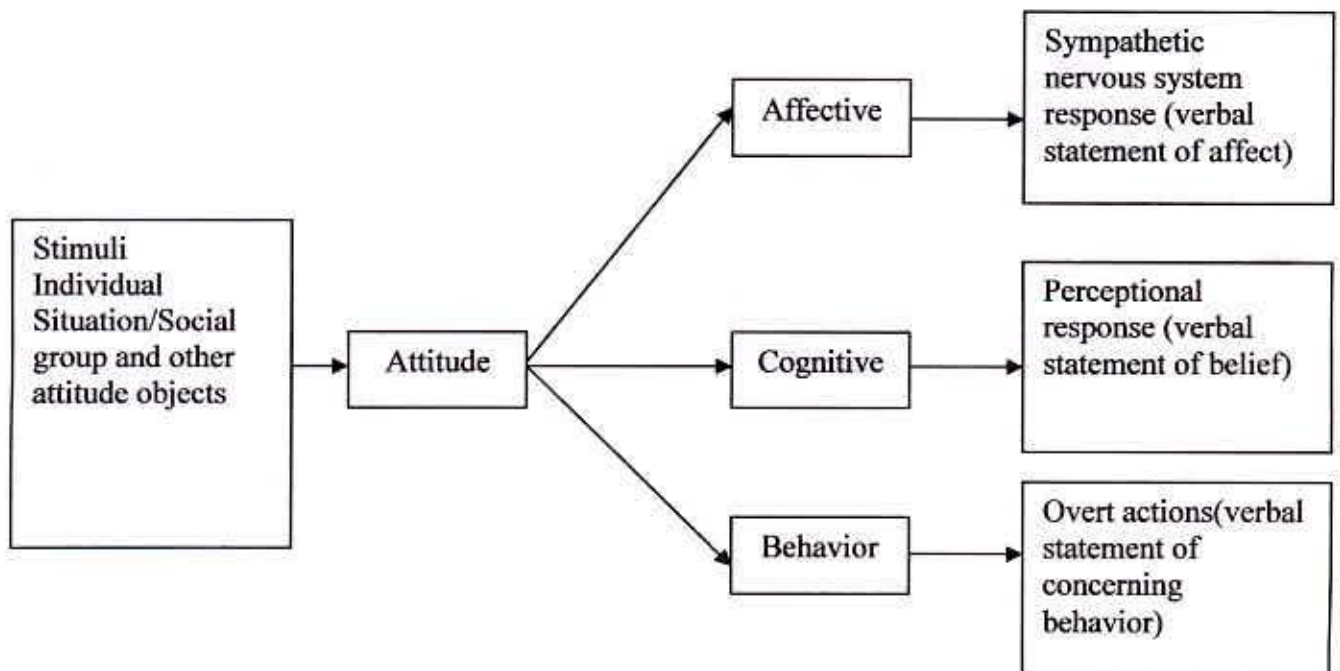


Fig: 1.1 A schematic conception of attitude (triands, 1960)



**The present investigation was designed to get the answers of the following questions:**

1. What is the strength of attitude of farmers towards improved agricultural implements?
2. What are the socioeconomic characteristics of the farmers that influence their attitude toward improved agricultural implements?
3. Is there any relationship between attitude and socioeconomic characteristics of farmers?

### **1.2 Statement of the problem**

The level of attitude determinate the success of any technology, which depends on its diffusion among the potential users. When any technology introduced ,it may fully adopt by the receivers. Discontinuity can also happen in this case regarding various factors. It is to be estimated that certain sustainable development can take place in the agriculture of Bangladesh, if the technology can be shifted accurately. Attitude of farmers towards improved agricultural implements are influenced by the farmer's demographic and socioeconomic position. The purpose of this study was to have an understanding of the present condition of attitude towards improved agricultural implements among the farmers in rural areas. In an outlook of previous discussion the investigator undertook a piece of study entiled "Attitude of farmers towards improved agricultural implements"

### **1.3 Specific objectives**

In order to find proper direction of the present study the following specific objectives were formulated:

1. To determine strength of attitude of farmers towards improved agricultural implements

2. To identify and describe following characteristics of the farmers :
  - Age
  - Education
  - Annual income
  - Farm size
  - Knowledge about agricultural implements
  - Innovativeness
  - Opinion leadership
  - Interpersonal communication
  - Social status
  
3. To explore the relationships of selected characteristics of the farmers with their attitude towards improved agricultural implements

#### **1.4 Justification of the study**

Gradually Bangladesh is proceeding toward farm mechanization. The research institutes so far developed varieties of improved agricultural implements. These implements are to be introduced in farm community. Before introducing the implements there is a need to justify attitude of farmers toward improved farm implements. The study is supposed to be useful for the scientists and extension personnel as well. present study will be helpful to the researcher for further studies of similar nature and to the NGO personnel who are directly involved in different agricultural program and to planners to making effective plans.



## **1.5 Scope and limitations of the Study**

Keeping in view the limitation of the time, money and other resources available to the researcher the following limitations were considered throughout the investigation:

1. The study was conducted confined to, Sadar upazilla under Jamalpur District.
2. The study was kept limited among the full time farmers of the study area.
3. Attitude of farmers towards improved agricultural implements could be measured in a number of ways. However, Likert technique was used in measuring attitude towards improved agricultural implements in this study.
4. Characteristics of farmers were many and varied. However, only nine characteristics were selected for investigation in this study.
5. Farmers attitude towards improved agricultural implements was determined against 20 items viz. improved tillage implements for good germination, improved tillage implements for soil fertility, use of paddle thresher, improved tillage implements for pulverization of soil, bank loan for purchasing improved tillage implements, use of rotavetor, weed management, water source for irrigation, unavailability of improved implements, large scale crop cultivation, use of improved tillage implements for post harvest operations, locally made agricultural implements, farmers training for the use of improved agricultural implements for proper use etc.
6. Data were collected from the head of the family. Incidentally all the family heads were male.

The adoption of agricultural technologies depends upon the positive attitude of their ultimate users. Formation of attitude is a difficult process. It is very much



related to motivation. Attitude may be changed through individual's self perception or through outside intervention. Use of improved agricultural implements needs to change user's attitude. Farmers themselves can change their attitude being motivated by self-urge or by change agents.

### **1.6 Assumptions**

An assumption is the supposition that an apparent fact or principle is true in the light of the available evidence. The investigator carried out the research keeping the following assumptions in mind.

1. Respondents included in the sample were the true representatives of the farmers in the study area in respect of attitude towards improved agricultural implements and the selected characteristics.
2. Respondents included in the sample were competent to give proper responses to the queries designed by the researcher.
3. The information provided by the respondents were reliable.
4. The non-agricultural and landless families held no attitude toward improved implements in the study area.
5. Attitude of the respondents were supposed to be changeable toward improved agricultural implements.
6. Respondent farmers of the study area used improved implements either by own possessing or hiring.
7. The selected characteristics of the respondents influence to change their attitude.

### **1.7. Statement the Hypothesis**

Hypothesis is a Greek word that means "to assume" and "paves the way for scientific exploration". Sometimes hypothesis of a phenomenon is accepted and

often times are questioned and debated. A hypothesis is an explanation that is proposed for a phenomenon. Formulation a hypothesis is a step of the scientific method.

There are mainly research hypothesis and null hypothesis. A research hypothesis is a statement of expectation or prediction that will be tested by research. A null hypothesis is rejected on the basis of empirical test, it is then concluded that there is a relationship between the concerned variables. The most important characteristics of a good hypothesis is clear and concise language. A hypothesis needs to be well written. When someone reads a hypothesis, they should know exactly what it is proposing . One important aspect of using hypothesis is that it helps to avoid the sin of rationalization, that is the formulation of an idea and then seeking of evidence to proved rather than to disprove or test it.

The following null hypotheses were formulated as there were no relationship between the selected characteristics of the farmers and their attitude towards improved agricultural implements.

1. There is no relationship between age of the farmers and their attitudes towards improved agricultural implements.
2. There is no relationship between education of the farmers and their attitudes towards improved agricultural implements.
3. There is no relationship between farm size of the farmers and their attitudes towards improved agricultural implements.
4. There is no relationship between income of the farmers and their attitudes towards improved agricultural implements.
5. There is no relationship between knowledge about improve agricultural implements of the farmers and their attitudes towards improved agricultural implements.



6. There is no relationship between innovativeness of the farmers and their attitudes towards improved agricultural implements.
7. There is no relationship between social status of the farmers and their attitudes towards improved agricultural implements.
8. There is no relationship between opinion leadership of the farmers and their attitudes towards improved agricultural implements.
9. There is no relationship between interpersonal communication of the farmers and their attitudes towards improved agricultural implements.

## **1.8 Definition of Terms**

The terms used throughout the study are defined and interpreted for the purpose of clarity of understanding.

### **1.8.1 Attitude of farmers towards improved agricultural implements**

Attitude may be thought of as a person's perspective toward a specific target and way of predisposition to act, perceive, think and feel in relation to something. It is learned and formed from the environment and social system. It is expressed as one's views regarding an object as positive or negative, favorable or unfavorable, like or dislike etc. with varying degrees. The farmers of the study area had favorable attitude towards improved agricultural implements. Favorable attitude means farmers of the study area use improved agricultural implements. Most of the moderate and strong attitude holders had improved implements of their own.



### **1.8.2 Age**

It means the age of a farmer that refers to the period of time from his/ her birth to the time of investigation

### **1.8.3 Education**

Generally education is the process of developing capabilities of the individuals so that they can adequately respond to their situation. But in this study education of an individual farmer was defined as the formal education received up to certain level from any educational institute (e.g. School, College and University) at the time of interview. Farmers level of education were measured on the basis of can't read and write, can sign only, studied class up to.

### **1.8.4 Annual family income**

Annual income referred to the total annual earnings of all the family members of a respondent from agriculture, livestock, fisheries and other accessible sources (business, service, daily working etc) during last year. It is expressed in Taka.

### **1.8.5 Farm Size**

The term farm size referred to the cultivated area either owned by a respondent farmer or cultivated on share cropping system, the area being estimated in terms of full benefit to the farmer. The right of a farmer on land taken on lease from others was also regarded as ownership. The stratification of farm size corresponds the stratification of farmers of rural Bangladesh. In this study farm size categorized by DAE (1999) was taken into consideration.



### **1.8.6 Knowledge about improved agricultural implements**

Knowledge may be defined as the scientific fact of an idea which is experimentally or empirically verified. Knowledge of an innovation occurs when an individual comes to know its existence with no detailed information. It occurs involuntarily or by individual's problem-solution seeking behavior. Agricultural knowledge referred to the understanding of the farmers about the different aspects of scientific agriculture such as improved seed, fertilizer, plant protection, irrigation, etc. There are three types of knowledge viz. 1. Awareness knowledge, 2. How-to-knowledge, 3. Principle knowledge (Rogers, 1983).

### **1.8.7 Innovativeness**

Innovativeness is the degree to which an individual is relatively earlier in adopting new ideas than the other members of his social system. There are five adopter categories viz. 1. Innovator, 2. Early adopter, 3. Early Majority, 4. Late Majority, 5. Laggards. The innovators, who are significantly more educated, cosmopolite in orientation, and belong to higher socio-economic status categories, tend to use institutional as well as impersonal sources more frequently than early and late adopters. The innovators have close contact with the institutional sources and are the first to receive information on and adopt an agricultural innovation. Because of their external contact, innovativeness, and reputation as successful farmers, they play the role of opinion leaders in passing on the information to laggards and average farmers.

### **1.8.8 Opinion Leadership**

Opinion leaders encourage people to proceed toward developmental changes. Rogers (1983) defined opinion leadership as "The degree to which an individual is able to influence other individual's attitude or overt behavior informally in a



desired way with relative frequency”. Opinion leadership is importantly necessary for diffusion of innovation. Characteristics of opinion Leader: 1. An opinion leader has technical competency, social accessibility and is most respected person in a social system, 2. He/she is equally exposed to both localite and cosmopolite communication media and channels, 3. S/he is cosmopolite, 4. S/he is innovative. There are two types of leadership: 1. Monomorphic opinion leadership, 2. Polymorphic leadership.

### **1.8.9 Interpersonal communication**

Individual to individual communication is referred to interpersonal channels of communication. Extension workers visit farm and home of farmers, farmers visit extension office, progressive farmers conduct demonstration, a group of farmers attend in group discussion, subject matter officers visit farmers field, training officers organize farmers training as functions of interpersonal communication channels. In fact social relationship are a network of interpersonal communications.

### **1.8.10 Social status**

When the person are placed in a high-low hierarchy on the basis of “have” or “have not” or on the basis of how much they have of valuable things then the position is referred as social status (Lionberger,1960). In farming community , generally status of the farmers is assessed by the size of the farms, their education, leadership, volunteer activities, innovativeness, arbitration, social worker etc .In case of farm ownership farmers may acquire status of big farmer, medium farmer, small farmer, marginal farmers and landless or tenant farmers.





## Chapter 2

# Review of literature

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## CHAPTER 2

### REVIEW OF LITERATURE

The purpose of this Chapter is to review of literature having relevance to the present study. The researcher made an elaborate search of available literature for the above purpose. But there is no enough dealing with the relationship of the characteristics of selected farmers and their attitude towards improved agricultural implements. The researcher attempted to search the literatures on a number of studies have been conducted on the attitude towards improved agricultural implements. Therefore, the finding of such studies related to the attitude towards improved agricultural implements and other partial studies have been reviewed in this chapter.

This Chapter is divided into three sections; the first section deals with concept of attitude with past research findings relating to farmers' attitude, the second section deals with past research findings relating to farmers' attitude with their selected characteristics. The third section deals with the conceptual framework of the study.

#### **2.1 Concept of Attitude with past research findings relating to farmers' attitude**

Different persons have defined attitude in many different ways. Some of these are given below:

Campbell (1950) defined attitude of an individual to refer to an enduring syndrome of response of consistency with regard to a set of social objectives.

Barnard (1965) defined attitude as a predisposition to act in certain way. It is a state of readiness that influences a person to act in a given manner.



Baldwin (1967) referred to attitude as a specific mental disposition towards an incoming or arising experience, whereby the experience is modified; or in other words, it is a condition of readiness for a certain type of activity.

According to Drever (1968), an attitude is a more or less stable set of disposition of opinion, interest, or purpose, involving expectancy of certain kind of experience and readiness with appropriate kind of response.

Ziaul (1987) studied a research on farmers' economic characteristics affecting their attitude towards use of urea in jute cultivation at Keyotkhali Union of Mymensingh Sadar Upazilla. The findings revealed that majority (59 percent) of the growers had unfavourable attitude towards use of urea, while 27 percent had favourable attitude, 10 percent very favourable attitude and the remaining four (4 percent), neutral attitude towards use of urea in jute cultivation.

Bari (2001) conducted a research on attitude of farmers towards Hybrid Rice Alok 6201 at Manda, Mohadebpur and Patnitala Upazillas of Naogaon district. He found that the highest proportion (45.3 percent) of hybrid rice growers had moderately favourable attitudes while 26.5 and 28.2 percent farmers showed unfavourable and favourable attitude respectively towards hybrid rice variety Alok 6201.

Hoque (2001) investigated the farmers' attitude towards organic matter use in crop production at two villages of Sadar Upazilla under Meherpur district. He observed that majority (more than 43%) of the farmers were found to have moderately favourable attitude, while about 30% farmers had highly favourable and 27% had slightly favourable attitude. There was no farmer having unfavourable attitude towards organic matter use.



Paul (2001) carried out a research on attitude of farmers towards use of urea super granule (USG) in rice cultivation at Abhaynagar Upazilla under Jessore district. It revealed that the majority of the farmers (59.62%) had moderately favorable attitude while 25% had slightly favorable attitude and 15.38% had highly favorable attitude towards the use of USG.

Sarker (2002) carried out a research on farmers' attitude towards organic homestead gardening programme of World Vision at Kuptala, Ramtlagar, Saihata and Bhelabari villages under Sariakandi upazilla of Bogra district. He found that more than three-fifth (64%) of the World Vision farmers were found to have moderately favorable attitude while 20% having slightly favorable attitude and only 16% farmers belonged to highly favorable attitude. He also found that majority of the World Vision farmers showed moderate to highly favorable attitude towards organic homestead gardening programme of World Vision.

Hossain (2002) also studied on the attitude of island farmers towards adoption of modern agricultural technologies at Musapur and Maitbhanga under Sandwip upazilla of Chittagong district. He studied revealed that the highest portion (65 percent) of the farmers fell under the medium attitude category, while 30 percent showed high attitude and only 5 percent had low attitude towards modern agricultural technologies. Thus, an overwhelming majority of the farmers had medium to high attitude towards modern agricultural technologies.

Ahaduzzaman (2003) conducted a research on farmers' attitude towards modern T. Aman technologies at two villages of Haridevpur union under Sadar Thana of Rangpur district. He found that about three-fifth (59.09%) of the respondents were found to have moderately favorable attitude while 14.55% having slightly favorable attitude and only 26.36% farmers belonged to highly favorable attitude.

## **2.2 Past research findings relating to the relationship of farmers' attitude towards selected practices with their selected characteristics**

This section presents a review of previous studies relating the association of the selected characteristics of the farmers and their attitude of some selected practices. Ten characteristics of the farmers were selected as independent variables of this study. The researcher made utmost efforts to search out studies dealing with relationships of each of the selected characteristics with attitude towards improved agricultural implements.

### **2.2.1 Age and Attitude**

After an elaborate analysis of association between age and attitudes, Stagner (1961) in his study concluded that it was difficult to say whether age in itself could affect attitudes. He concluded from his review of past researches that people would become better integrated and somewhat more extreme in their attitude, as they would grow older.

Rogers and Leuthold (1982) conducted a study in Miami country and found that farmers of younger age had more favorable attitude towards fertilizers proactive than the elderly farmers, but the differences were not statistically significant.

Iqbal (1963) reported that elderly farmers had more favorable attitude towards improved and modern agricultural practices as compared to younger age groups.

Nawaz (1968) conducted a study on the characteristics of farmers and adoption of improved farm practices in Pakistan villages. He indicated that the age of the farmers was positively associated with the adoption of improved farm practices.

But Rahim (1961) in a study on diffusion and adoption of agricultural cultural practices in Comilla Kotwali thana found that the age of the farmers was not



important factor. Adoption of improved farm practices was independent of the age of the farmers.

Rahman (1974) reported that the age of the schemes farmers had no relationship with the formation of attitude towards HYV of rice, but in case of non scheme farmer's age had a significant positive relationship.

Singh (1982) observed, that attitude of farmers towards improved crop production technology of irrigated and non-irrigated groups were heavily skewed into favorable category. However, the difference between mean attitude scores of the two groups of farmers were significant and were in favor of farmer who had irrigated farm holdings. The age of the farmers was positively and significantly related to their attitude of the farmers of two groups.

Singh and Kungroo (1985) found that there was negatively significant relationship between age and attitudes of farmer towards goat and sheep farming.

Verma and Kumar (1991) conducted a study on comparison of farmer's attitude towards buffalo management practice in adopted and non-adopted village. The study revealed that there was relationship between age and attitudes towards buffalo management in case of adopted village and they found no significant relationship between age and attitude of the farmers of non-adopted village.

Bari (2001) conducted a research on attitude of farmers towards Hybrid Rice Alok 6261 at Manila, Mohadebpur and Patnitala Upazillas of Naogaon district. He found no relationship between age of the farmers and their attitude towards Hybrid Rice Alok 6201.

Hoque (2001) investigated the farmers' attitude towards organic matter use in crop production at two villages of Sadar Upazilla under Meherpur district. He observed



that there was no relationship between age of the farmers and their attitude towards organic matter use in crop production.

Paul (2001) carried out a research on attitude of farmers towards use of urea super granule (USG) in rice cultivation at Abhaynagar Upazilla under Jessore district. He also found that there was no relationship between age of the farmers and their attitude towards use of USG in rice cultivation.

Sarker (2002) carried out a research on farmers' attitude towards organic homestead gardening programme of World Vision at Kuptala, Ramnagar, Saihata and Bhelabari villages under Sariakandi upazilla of Bogra district. He reported that age had insignificant but negative relationship with farmers attitude towards organic homestead gardening programme of World Vision.

Ahaduzzaman (2003) conducted a research on farmers attitude towards modern T. Aman technologies at two villages of Haridevpur union under Sadar Upazila of Rangpur district. He found that there was insignificant positive relationship between age of the farmers and their attitude towards modern, T-Aman technologies.

Islam (2005) conducted a study on adoption of pashu pushti in cattle rearing farmers' level. He observed that age of the respondents had significant relationship with their extent of adoption of pashu-Ppushti in cattle rearing at farmers' level.



### **2.2.2. Education and Attitude**

Rogers and Havens (1981) in their research on comparative study of changes in farmers attitudes towards fertilizers in two countries of Ohio and Miami precondition for forming positive attitudes and farmers having higher education tended to adopt farm innovation earlier.

Rogers and Leuthold (1982) in their study found that the farmers demonstrators, who were characterized by more years of formal education, were at the same time characterized by more favourable attitudes towards- fertilizer.

Karim (1973) on the adoption behaviour of transplanted aman rice growers in respect of fertilizers revealed that there was a substantial positive relationship between the functional literacy of farmers and their attitude towards fertilizer adoption.

Wahab (1975) reported that there was positive and significant relationship between education and attitude towards' the use of phosphorus and potash fertilizers while the relationship was not significant in case of attitudes towards the use of urea and their education.

Singh (1982) observed that family education was positively related to their attitude towards agricultural technology and this relationship was statistically significant.

Verma and Kurnar (1991) reported that there was positive and significant relationship between education and attitudes of farmers towards buffalo management in non-adopted village but the relationship was not significant in adopted village.

Okoro and Obibuaka (1992) studied adoption of recommended practices among small holders in IMO state, Nigeria. The findings of the study indicated a positive



relationship between education of the respondents and their attitude towards adoption of recommended management practices.

Muttaleb (1995) studied the relationship of education with adoption of improved potato technologies. The study observed that education had a positive relationship with their attitude towards adoption of potato technologies.

Hasan (1996) conducted a study on adoption of some selected agricultural technologies among the farmers as perceived by the frontline GO and NGO workers. He found that the education had no significant relationship with their attitude the perceived adoption of selected agricultural technologies.

Bari (2001) conducted a research on attitude of farmers towards Hybrid Rice Alok 6201 at Manda, Mohadebpur and Patri tala Upazillas of Naogaon district. He found that there was negative significant relationship between education of the farmers and their attitude towards Hybrid Rice Alok 6201.

Hoque (2001) investigated the farmers' attitude towards organic matter use in crop production at two villages of Sadar Upazilla under Meherpur district. The findings of the study indicated a positive significant relationship between education of the farmers and their attitude towards organic matter use in crop production.

Paul (2001) carried out a research on attitude of farmers towards use of urea suffer granule (USG) in rice cultivation at Abhaynagar Upazilla under Jessore district He also found that there was positive significant relationship between education of the farmers and their attitude towards use of USG in rice cultivation.

Aurangazeb (2002) observed than there was positive relationship between education and their attitude towards adoption of integrated homestead farming technologies.



Sarker (2002) carried out a research on farmers' attitude towards organic homestead gardening programme of World Vision at Kuptala, Ramnagor, Saihata and Bhelabari villages under Sariakandi upazilla of Bogs district. He reported that education of the farmers was positive significant relationship with their attitude towards organic homestead gardening programme of World Vision.

Ahaduzzaman (2003) conducted a research on farmers' attitude towards modern T. Amen technologies at two villages of Haridevpur union under Sadar Thane of Rangpur district. He found that there was positive significant relationship between education of the farmers and their attitude towards modern T-Aman technologies.

Hossain (2003) concluded that education of the farmers had a significant and positive relationship with their adoption of modern Boro rice cultivation practices.

### **2.2.3 Annual Family Income and Attitude**

In discussing the characteristics of agricultural innovators, Rogers (1983) in a study mentioned that a much higher gross farm income was the characteristics of innovators and early adopters.

Kashem (1987) found that income of the small farmer has no significant relationship with their attitude towards community of the farmers. Similar observations were found by Rahman (1974).

Bari (2001) found in the study attitude of farmers towards Hybrid Rice Alok 6201 that there was negative relationship between annual family income and attitude.

Paul (2001) revealed in his study attitude of farmers towards use Urea Super Granule (USG) in rice cultivation that there was positive significant relationship between annual family income and attitude.

Hossain (2002) revealed that there was no significant relationship between attitude and annual family income in his study on attitude on Island farmers towards adoption of modern agricultural technologies.

Sarker (2002) found in the study farmers' attitude towards organic homestead gardening programme of World Vision that there was negative relationship between annual family income and attitude.

Ahaduzzaman (2003) conducted a research on farmers' attitude towards modern T. Aman technologies at two village of Haridevpur under Sadar thana of Rangpur district. He found that there was significant positive relationship between annual family income and attitude.

#### **2.2.4 Farm Size and Attitude**

It was revealed while conducting the first ever-agricultural census (Pakistan Census of Agriculture) of the country in 1960 that the proportion of farms using chemical fertilizers increased with increase in the size of farms. In other words, it meant that farm size was positively related with the fertilizer use.

Ahmed (1967) found that 62.57% of the big farmers, 37.14% of the medium farmers and 8.94% of the small farmers of Dhaka district used NPK. In a sharp contrast to the above findings, proportion of farmers use only nitrogenous fertilizer increased with the decrease in the size of farm.

In regard to adoption of improved practices by the farmers, Ali (1971) opined that the size of farm of rice and banana growers had little bearing upon the rate of adoption of recommended practices.

Hossain (1971) reported a strong and consistent positive relationship between the size of the farm and adoption of each of the four recommended farm practices. But



Mormon (1972) in his study on the adoption of IR-20 in Comilla found that the size of the farm did not appear to be a significant factor influencing the farmers to adopt IR: 24.

Rahman (1974) on the basis of a study examined the relationships of six independent variables including farm size with the attitudes of farmers towards HYV of rice and organizational effectiveness of ARPP. He observed that irrespective of scheme or non-scheme farmers, there was no relationship between size of farm and their attitudes towards HYV of rice. The study also revealed that no relationship between size of the farm and attitudes of the farmers towards the organizational effectiveness of ARPP.

Wahab (1975) reported that there was positive and significant relationship between farm size and attitudes towards the use of phosphorus and potash fertilizer and there was no relationship between farm size and attitudes toward the use of urea fertilizers.

Sobhatn (1975), Singh (1989) and Ali (1993) found that there was no significant relationship between farm size of the farmers and their adoption of improved farm production technologies. However, Inayetullah (1962) made an investigation in Pakistan to determine the factors affecting adoption of improved practices. He did not find any relationship between farm size and the adoption potential. His finding was very much in agreement with that of Islam (1971) and Merman (1972).

Vidyasankar (1977) found that the seed grower had more favourable attitude towards seed production technology than non-seed growers and seed grower had large farm holding than non-seed growers.

Talukder *et al.* (1983) reported that large (>3ha) and medium farmers (1 to 3 ha) were more careful in the use of NPK for Boro rice only. The fertilizer use was



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significantly less in local Rice than HYV Rice. In HYVs of major crops the fertilizer use per hectare was more in Bozo followed by Aus, T-Aman and Jute.

Karim *et al.* (1987) carried out a study on attitudes of farmers towards the use of urea in jute cultivation and found that farm size of the farmers had significant and positive relationship with their attitude towards the use of urea.

Bari (2001) reported that there was negative relationship between farm size and attitude in his study attitude of farmers towards hybrid rice. Alok 6201.

Hossain (2002) revealed that there was no relationship between attitude and farm size in his study on attitude on Island farmers towards- adoption of modern agricultural technologies.

Ahaduzzaman (2003) found in his study on Farmers' attitude towards modern T.Aman technologies that there was positive significant relationship between farm size and attitude.

### **2.2.5 Knowledge on improved agricultural implements and attitude**

Moulik *et al.* (1966) conducted a study on predictive values of some factors of adopting fertilizers by Northindian fan-nerss in India. He found a significant positive relationship between agricultural knowledge and adoption of nitrogenous fertilizer among cultivators. Similar findings between agricultural knowledge and adoption had also been reported by Hoffer and Tangland (1958), Rarnaebandran (1974), Somasundaram and Singh (1978), Bezborra (1990) and Grewal (1980).

Koch (1985) conducted study in Western Orane Free State, South Africa concerning perception of agricultural innovations, aspirations knowledge and innovation adoption. It was found that there was a strong positive relationship between perception, and knowledge. This findings very much in agreement with



that of Rogers and Shoemaker (1981). However, significant difference was found between participant non-participant farmers in respect of, knowledge level and adoption behaviour and there was significant association. Between knowledge and adoption with respect to adoption of an improved package of practices in paddy production by participant and non participant farmers as reported Reddy *et al.* (1987).

Paul (2001) revealed in his study attitude of farmers towards use of Urea Super Granule (USG) in rice cultivation that there was positive significant relationship between

Hossain (2002) revealed that there was significant relationship between attitude and agricultural knowledge in his study on attitude on island farmers towards adoption of modern agricultural technologies.

Sarker (2002) found in the study farmers attitude towards organic-homestead gardening programme of World Vision that there was negative significant relationship between knowledge on organic homestead gardening and attitude.

### **2.2.6 Innovativeness and Attitude**

Mansur (1987) found that a significant negative relationship between the farmers innovativeness and their confrontation in feed and feeding the cattle.

Sharma and Sanoria (1983) observed a higher average innovativeness among contact farmers than the non contact farmers. They also found that knowledge of both the contact and non contact differed.

Nurzaman (2000) in his study observed that innovativeness of the FFS and non FFS farmers had no relationship with their attitude towards IPM.



Paul (2001) revealed his study attitude of hers towards use of Urea Super Granule (USG) in rice cultivation that there was positive significant relationship between and attitude.

Hossain (2002) revealed that there was significant relationship between attitude and innovativeness in his study on attitude on Island farmers towards adoption of modern agricultural technologies.

### **2.2.7 Interpersonal communication and Attitude**

Karim (1973) reported that higher the extension exposure of the farmers, higher was their adoption behavior in respect of fertilizer. Again, Vidyasharker (1977) study revealed that the contact with extension agency had contributed favourable to the attitudes of the farmers.

Bhaskaran *et al.* (1985) showed that the economic status and adoption were significantly correlated with interpersonal communication in less progressive village. In case of progressive village media participation, management, orientation and adoption were significantly correlated with the farmers Interpersonal Communication Behaviour Efficiency Index (ICBEI). And to the non-progressive village extension orientation, management orientation and crop Yield were significantly correlated with farmers ICBEI.

Ahaduzzaman (2003) conducted a research on farmers' attitude towards modern T aman technologies at two villages of Haridevpur union under Swat Thana of Rangpur district. He that there was significant positive relationship between extension media contact and attitude.

Sandal (1974) undertook a study to find out the relative effectiveness of group discussion; literature and result demonstration. The study revealed that exposure by extension methods produces change in knowledge and attitude; of the, subjects



and that methods differ in their, power to affect such change. A combination of methods was found superior to any method and the effectiveness of the method was greatly influenced by the background variables like values and level of family education.

Kumari (1988) conducted a study on the effectiveness of mix-media of rural women for health education. The study revealed that the majority of women was dependent heavily on locality sources of information did not have urban contact. However they had somewhat favorable attitudes towards the messages.

Sardar (2002) concluded that the extension contact of the farmers had significant positive relationship with their adoption of IPM practices.

Aurangozed (2002) conducted a study on adoption of integrated homestead fanning technologies the rural women in RDRS. He found that there was significant relationship between contact with extension media and adoption of integrated homestead farming technologies.

Sarker (2002) found in the study farmers attitude towards organic homestead gardening programme of World Vision that there was significant positive relationship between extension media contact with attitude towards organic homestead gardening programme.

### **2.2.8 Opinion Leadership and attitude**

The available research evidence indicates that opinion leaders are more innovative than their followers that help to create more attitudes towards improved agricultural implements.

Rahudkar (1962) in a study observed that opinion leaders had higher adoption rate towards improved agricultural implements than their followers.

In Bangladesh, Rahim (1963) found that opinion leaders had higher adoption score than the average farmers in terms of improved agricultural implements. Similar results were also obtained by Rogers and Burdge (2003) in seven Ohio truck growing communities. They observed that the average adoption score for the sociometric leaders was 28 percent higher than the score obtained by the average truck growers in the sample. All but one of the 14 opinion leaders was more eager for improved potato cultivation than the average grower in their community.

Chan and Mishra (1990) found similar results in a Kentucky community in their earlier studies. But further proving revealed that in the areas of high adoption the farmers who were sought as sources of information were ahead in the use of recommended farm practices than the ordinary farmers while in the areas of low adoption of improved agricultural practice this difference was obscure. However, Rogers (2003) after undergoing an exhaustive review of past researches in relation to opinion leadership and adoption of improved farm practices reported that opinion leaders were more pioneering than the average farmers.

Zainuddin (1972) found in his study in Malaysia that leadership was positively associated with adoption of new practices.

Sohi (1976) conducted a knowledge test on recommended practices in plant breeding, agronomy, soil management, plant protection, vegetables, fruit cultivation, and animal husbandry to 86 village level workers in Punjab. On a possible range of knowledge score from 0 to 100, 12 received a low score of 0-36, 38 a medium score of 37- 47, and 36 received a high score of 36-100. The average knowledge score of the VLWs also 45, that is, it fell in the medium range. According to the author of the study, since the VLWs also had to engage in work that was not related agriculture, they spent inadequate time in communicating



agricultural information to farmers and consequently, they themselves did not always have the knowledge about the more recent innovations. The VLWs, however, had a high knowledge score for practices relating to soil management, plant protection, animal husbandry, and plant breeding, for they advised farmers on these practices more frequently. Their knowledge scores were low for the practices on vegetables, fruit cultivation and agronomy.

Islam (1971) examined the relationship of agricultural knowledge of the managers of primary agricultural cooperative societies with the adoption of improved agricultural technologies by their societies. Adoption on three innovations, namely, new crop, tractor cultivation and irrigation was investigated by Islam. He found positive relationship of improved agricultural practice of the managers with adoption of all the three innovations by their societies. The findings indicate that improved agricultural practice of the managers helps them to perform their leadership function better.

Rahim (1963) in a study of Pakistani village reported that opinion leaders (local leaders) used more magazines, newspapers and extension service bulletins. The findings indicate that the opinion leaders read more farm magazines and other printed materials in agriculture. It is likely that the opinion leaders, through such reading, acquire knowledge and skill which help them to function as opinion leaders. Such consideration suggests a positive relationship between improved agricultural practice of the farmers and opinion leadership in rural areas.

Rogers (2003) investigated that change agents, as sole entities of the diffusion of innovations, have scarce resources and limited access to peers. He suggests that communication strategies should target opinion leaders, who then are going to target their peers. The number of individuals reached at the end is higher and

adoption is sustained through time. Participatory approaches have shown to be effective as innovations are diffused. The involvement of opinion leaders increases the credibility of innovations because these opinion leaders convince their peers to adopt appropriate innovations. In addition, innovations that are validated by an opinion leader acquire local sponsorship and sanction. Therefore, to achieve long term adoption, opinion leaders should lead the diffusion process.

### **2.2.9 Social status and attitude**

Raju (1990) conducted a study in Andhr Pradesh and it was found that The man who is in higher social status, used more frequently communicate with extension personnel than ordinary people. They are more interested towards improved agriculture like improved potato and wheat cultivation.

Wilson and Gallup (1985) on the basis of a study concluded that the extent to which farmers and home makers who are local leader or opinion leader made contacts with members of the extension staff largely determined the adoption of recommended practices. The study revealed that 87 percent of the contact group reported the adoption of agricultural practices in contrast with 38 percent of the non-contact group. Thus higher social status made higher contact with extension personnel which help more adoption improved agricultural technologies.

Ahmed (1984) conducted a study on the agricultural knowledge of the farmers. He found a positive relationship between local leader or opinion leader (i.e. higher status people of the society) of the farmers and their agricultural knowledge. Findings of research as presented above indicate that extension contact has favorable influence on the adoption of improved farm practices and agricultural knowledge. Opinion leaders in the rural areas are the persons who generally have higher adoption of improved practices and more agricultural knowledge.



Reddy and Kivlin (1968) conducted a study on the adoption of high yielding varieties in three Indian villages. They found that the adopters of HYV were more likely to local leaders than others. Contact with agricultural extension agents was also positively related to adoption of HYV. Adopters had substantially more contact with extension personnel.

### **2.3 The Conceptual Framework of the Study**

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research when constructed properly contains at least two important elements i.e. “a Predicted variable” and “an Experimental variable”. A predicted variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the experimental variables (Townsend, 1953). An experimental variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. In view of prime findings of the review of literature, the researcher constructed a conceptual framework of the study which is self explanatory and is presented in Fig. 2.1.

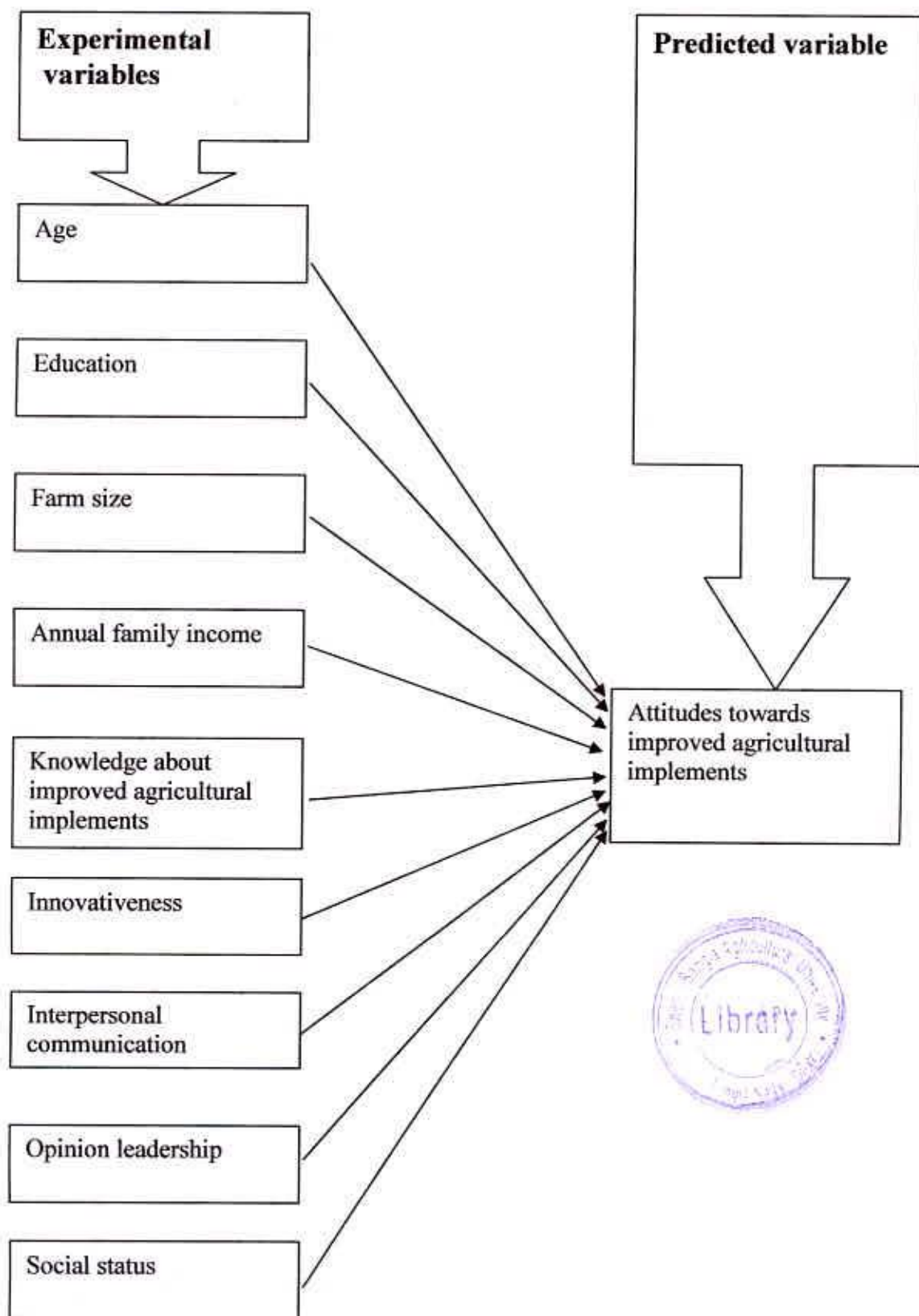


Fig. 2.1 Conceptual framework of the study





## Chapter 3

# Materials and Methods

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## **CHAPTER 3**

### **METHODS AND MATERIALS**

#### **3.1 METHODOLOGY**

Methods and procedures used in conducting research need very careful consideration. Methodology should be such that enables the researcher to collect valid information and to analyze the same properly to arrive at correct decisions. The methods and procedures followed in conducting this research are described below.

##### **3.1.1 Locale of the study**

The study was conducted in Bushchara union of Jamalpur sader upazila under Jamalpur district. The Sader upazila of Jamalpur District was selected purposively as the study area. Jamalpur District has 68 unions. Among them Bunschchara union was selected randomly. Again Banshchara has 11 villages out of which 6 villages were selected randomly. The selected 6 villages respondents were the locale of the study. The six villages are namely Nababpur, Jhaura, Banshchara, Jighatala, Jamira and Balbelia. For clarity of understanding one map of Banshchara union showing study area appears at Figure 3.1.

##### **3.1.2 Population and sampling**

The farmers of the randomly selected villages were considered to be the population of the study. An up to-date list of the farmers of selected villages were made with the help of Agricultural Extension Officer of the Upazila. There were 1201 farm households in the selected six villages. One hundred and twenty farmers were selected randomly as the sample of the study. A reserve list of 12 respondents were also prepared in case of non-availability of sampled growers.





Fig. 3.1: Jamalpur Sadar Upazila of Jamalpur District

**Table1. Distribution of sampled farmers constituting the population, sample and reserve list in selected villages under Sadar upazila of Jamalpur district**

Sl. No	Name of the villages	Numbers of Growers		Reserve list
		Population	Sample	
01	Nababpur	210	21	2
02	Jhaura	220	22	2
03	Banshchara	240	24	2
04	Jighatala	170	17	2
05	Jamira	201	20	2
06	Balbelia	160	16	2
	Total	1201	120	12

### 3.1.3 Instrument for collection of data

As an instrument for collection of data, an interview schedule was prepared keeping in view the objectives of the study. The interview schedule contained both open and closed form of questions. Scales were developed assigning suitable score for measuring dependent and independent variables. The rough interview schedule was pretested by administering it among 12 farmers of Sadar upazila under Jamalpur district. The pretest was helpful to find out gaps and to locate faulty questions and statements. An alterations and adjustments were made in the schedule on the basis of experience of the pretest. Then final draft was prepared and multiplied. It was then ready for collection of data.

### 3.1.4 Collection of Data

The researcher herself collected data from the respondents in a face-to-face situation through interview schedule. Before starting collection of data, the researcher met with the Sub Assistant Agriculture Officers (SAAO) of different blocks and Chairman of the union and requested them to provide necessary help and cooperation in collection of data. The Union Parishad Members and the local



leaders of the area were also approached to render essential help. As a result of all these a good working atmosphere was created in the study area which was very helpful for collection of data by the researcher.

Before going to the respondents they were informed earlier, so that they would be available in their respective area. The interviews were held individually in the house or farm of the respective respondent. A respondent farmer might feel hesitate in giving some information about matters relating to him. Keeping this in her mind, the researcher explained the purpose of the study as well as established rapport before starting interview with any respondent. Whenever the respondent faced difficulty in understanding any question, the researcher took utmost care to explain the same clearly.

No serious problem was faced by the researcher in collecting data. However, it was not possible to collect from two respondent farmers, as they were not available at the time of interview. It was supplemented by interviewing the two farmers from the reserve list. Collection of data took 30 days from the 1<sup>st</sup> March to 30<sup>th</sup> March, 2013.

### **3.2 Variables of the Study**

In social research, the selection and measurement of variables constitute an important task. In this connection, the researcher looked into the literature to widen her understanding about the nature and scope of the variables involved in the research studies. Ezekiel and Fox (1959) defined a variable as any measurable characteristics which can assume varying or different values in successive individual cases. The hypothesis of a research, while constructed properly, contains at least two important elements, viz. an experimental variable and a predicted variable.

An experimental variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationships to an observed phenomenon (Townsend 1953). Maintain the characters of farmers as independent variables is that factor which appears, disappears or varies as the experimenter introduces, removes or varies the independent variables. Maintain the name of dependent variable is often called the criterion or predicted variable, where as the experimental variables is called the treatment, experimental or antecedent variable.

### **3.3 Selection of Predicted and Experimental Variables**

Attitude towards improved agricultural implements of selected farmers was the main focus of this study and it was considered as the predicted variable. So, the character, attitude was selected as predicted variables.

For selection of experimental variables the researcher went through the past related literature as far as available. She discussed with the teacher, experts in the relevant fields and research fellows in agricultural extension and related disciplines. She also carefully noticed the various characteristics of the growers of the study. Availability of time, money and other resources were also kept in view in selecting the variables.

Characteristics of the selected farmers (age, education, farm size, annual family income, knowledge in agriculture, innovativeness, social status, opinion leadership and interpersonal communication) were selected as experimental variables.

### **3.4 Measurement of Variables**

#### **3.4.1 Measurement of experimental/antecedent/treatment Variables**

It was pertinent to follow a methodological procedure for measuring the selected variables in order to contact the study in accordance with the objectives already



formulated. The procedures for measuring the experimental variables are described below:

#### **3.4.1.1 Age**

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

#### **3.4.1.2 Education**

Education score was computed for each respondent by giving one (1) score for each year of successful schooling completed. The person who could sign only she was given a score 0.5 and who did not know how to read and write scored 0(zero).

#### **3.4.1.3 Annual Family Income**

Annual family income of a respondent was measured on the basis of total yearly earning from agriculture and other sources (service, business, daily labor etc.) by the respondent himself/herself and other family members. For calculation of income score, one (1) score was assigned for one thousand taka. If a respondent earn Tk. 10,0000 his annual family income score could be 100.

#### **3.4.1.4 Farm Size**

Farm size of a farmer was determined by his/her total quality of land she/he possessed on which she/he was engaged in farm operation for economic benefit. Farm size was measured for each respondent in terms of hectares by using the following formula:

$$\text{Farm size} = A_1 + A_2 + \frac{1}{2}(A_3 + A_4) + A_5$$

Where,  $A_1$  = homestead area of the respondent

$A_2$  = Own land under own cultivation

$A_3$  = Area taken on share cropping

$A_4$  = Area given to others on share cropping

$A_5$  = Area taken from others on lease

#### 3.4.1.5 Knowledge about improved agricultural implements

Agricultural knowledge score of a respondent was measured by asking him/her 15 questions on different aspects of agricultural knowledge regarding farm mechanization. Each correct answer for each question was weighted 2 marks, Zero was given for incorrect answer. However, partial marks was given for partial correct answer. Thus the agricultural knowledge of the respondents could range from 0 to 30, 0 indicates low knowledge and 30 indicating very high knowledge on improved agricultural implements.

#### 3.4.1.6 Innovativeness

Innovativeness score of a respondent was measured by asking him/her about 14 items about improved agricultural implements with the degrees of their use. Scoring was done according to the degree of early use of improved agricultural implement. The degree of innovativeness of a respondent was scored in the following manner:

<u>Nature of participation</u>	<u>Scores</u>
Never used	0
Used after 3 years of hearing	1
Used within 2- 3 years after hearing	2
Used within 1- 2 years after hearing	3
Used within 1 year after hearing	4



Innovativeness score of a respondent was obtained by adding the scores for his implementation in all categories on the basis of his responses. The score could range from 0 to 56, which zero (0) indicating no innovativeness and 56 indicating the highest innovativeness.

#### **3.4.1.7 Opinion leadership**

Opinion leadership score of a respondent was measured by asking him 10 statements on different aspects of agricultural opinions, which were included in item no. 8. of the interview schedule. The opinion leadership items were consisted of improved variety, marketing, intercultural operations etc. Score were assigned according to the extent of leadership for the items selected in the questionnaire in the following manner:

<b><u>Extent of leadership</u></b>	<b><u>Scores</u></b>
No opinion	1
Rarely opinions	2
Occasionally opinions	3
Regularly opinions	4

Thus, the opinion leadership of the respondents could range from 10 to 40 where 10 indicated no opinion was given to the farmers about improved agriculture and 40 indicated regular opinion were given to the farmers about improved agriculture.

#### **3.4.1.8 Interpersonal communication**

The Interpersonal communication of a respondent was measured by the degrees of exposure of 12 communication channels. The degrees of exposure and their score assigned in the following manner:

<u>Source of communication</u>	<u>Score</u>
Not at all	0
Rarely	1
Occasionally	2
Often	3
Regularly	4

Thus, Interpersonal communication score of the respondents could range from 0 to 48, where 0 indicating no interpersonal communication and 48 indicating very high Interpersonal communication.

#### **3.4.1.9 Social status**

For measuring Social status of a respondent , 10 items were considered for this study. It was the degrees of possession of social status items such as farm size, education level, annual income, innovativeness, leadership reputation, arbitrator, social worker, decision maker, common advisor etc. Score was assigned according to the degrees of status of a respondent. Social status of a respondent was scored in the following manner

<u>Nature of participation</u>	<u>Scores</u>
Very low	1
Low status	2
Moderate status	3
High status	4

Social status score of a respondent was calculated by adding all the scores items according to the degrees of social status. The social status score could range from 10 to 40, where 10 indicated very low social status and 40 indicated very high social status.



### **3.4.2 Measurement of predicted variable**

Attitude of farmers towards improved agricultural implements was the predicted variable of this study. After through consultation with relevant experts, reviewing of existing literatures and searching web-sites 20 statements were considered to measure attitude of the farmers towards improved agricultural implements. Out of these 20 statements 10 were positive and 10 were negative statements as shown in item No.10 at the interview schedule (Appendix-1). To determine attitude of farmers towards improved agricultural implements all the 20 attitudinal statements were prepared with five degrees of agreement (according to Likert) viz. strongly agree, agree, undecided, disagree, strongly disagree, against assigned scores as 5, 4, 3, 2 and 1 respectively for the positive statement. Reverse scores were assigned for negative statements. Overall attitude score of respondent farmers towards improved agricultural implements was obtained by summing up the scores of all attitudinal statements.

Thus, the attitude of farmers towards improved agricultural implements score could range from 20 to 100; where 20 indicating strongly disagree and 100 indicating strongly agree attitude towards improved agricultural implements.

### **3.5 Data Processing and Analysis**

After completion of field survey, all the data were processed according to the objectives of the study. Local units were converted into standard unit. All the individual responses to questions of the interview schedule were transferred to master sheet to facilitate tabulation, categorization and organization. In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative form. Data was transferred to coding sheet with numerical scores given to each question. Simple statistics like frequency, percentage, range, mean, standard deviation and rank were used to perform the data analysis. Spearman

rank correlation coefficient ( $r$ ) were used to determine the relationships between selected characteristics of the farmers and their attitude towards improved agricultural implements.

### 3.6 Statistical Treatment

Collected data were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. Qualitative data were quantified by means of suitable scoring techniques. The statistical measures such as range, mean, standard deviation, percentage distribution were used to describe the variables. Categories of the respondents were done based on the nature of the variables. Tables were also used in presenting data for clarity of understanding.

In order to explore the relationships of the selected characteristics of the growers with their attitude towards improved agricultural implements, the Spearman rank Correlation Co-efficient was computed. Correlation matrix were also computed to determine the inter relationships among all as shown in Appendix-2. Five percent (0.05), level of significance was used as the basis of rejecting any null hypothesis.

If the calculated value of co-efficient of correlation " $r$ " was equal to or greater than tabulated value at designated level of significance for the relevant degrees of freedom, the null hypothesis was rejected and it was concluded that there was a significant relationship between the concerned variables. However, when the calculated value of co-efficient of correlation was found to be smaller than the tabulated value at the designated level of significance for the relevant degrees of freedom, it was concluded that the null hypothesis was accepted and hence, there was no relationship between the concerned variables. Co-efficient values significant at 0.05 level is indicated by single asterisk (\*) and at 0.01 level by double asterisks (\*\*). NS level by non-significant (<sup>NS</sup>).



### **3.7 Statement of Hypothesis**

According to Goode and Hatt (1952), "A hypothesis is a proposition which can be put to a test to determine its validity. It may seem contrary to or in accord with the commonsense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test." In studying relationships between variables research hypothesis are formulated which that anticipate relationships between the variables. However, for statistical test, it becomes necessary to formulate null hypothesis. A null hypothesis states that there is no relationship between the concerned variables. If a null hypothesis is rejected on the basis of statistical test, it is assumed that there is a relationship between the concerned variables.


The following null hypotheses were formulated to examine the relationships of the selected characteristics of the selected farmers with their attitude for receiving improved agricultural implements.

1. There was no relationship between age of the selected farmers and attitude towards improved agricultural implements.
2. There was no relationship between education of the selected farmers and attitude towards improved agricultural implements.
3. There was no relationship between farm size of the selected farmers and attitude towards improved agricultural implements.
4. There was no relationship between annual family income of the selected farmers and attitude towards improved agricultural implements.
5. There was no relationship between knowledge of the selected farmers and attitude towards improved agricultural implements.
6. There was no relationship between innovativeness of the selected farmers and attitude towards improved agricultural implements.

7. There was no relationship between social status of the selected farmers and attitude towards improved agricultural implements.
8. There was no relationship between opinion leadership of the selected farmers and attitude towards improved agricultural implements.
9. There was no relationship between interpersonal communication of the selected farmers and attitude towards improved agricultural implements.







**Chapter 4**  
**Results and Discussion**

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## CHAPTER 4

### RESULTS AND DISCUSSION

In this Chapter, the findings of the study and interpretation of the results have been presented. Data obtained from respondents by interview were measured, analyzed, tabulated and statistically treated according to the objectives of the study. These are presented in three sections according to the objectives of the study. Attitude towards improved agricultural implements among the farmers were discussed in the first section and characteristics of farmers were discussed in the second section. Relationship between the selected characteristics of the farmers with their attitude towards improved agricultural implements are discussed in the third section.

#### **4.1 Attitude of farmers towards improved agricultural implements**

Attitude towards improved agricultural implements score of the farmers ranged from 51 to 70 with mean 60.69 and standard deviation 3.90 against the possible range of 20-100. According to the attitude score the respondents were classified into three categories as follows:

<b>Categories</b>	<b>Basis of categorization(score)</b>
Unfavorable attitude towards improved agricultural implements	22-59
Neutral attitude towards improved agricultural implements	60
Favorable attitude towards improved agricultural implements	61-100



**Table 2: Distribution of farmers based on this categories is shown in below**

Categories	Farmers		Mean	SD
	Number	Percent		
Unfavorable attitude (20-59)	50	41.7	60.69	3.90
Neutral attitude (60)	9	7.5		
Favorable attitude (61-100)	61	50.8		
Total	120	100		

Data in the Table 2 indicate that above half of the farmers (50.8%) had favorable attitude towards improved agricultural implements whereas 41.7% had unfavorable attitude and 7.5 % had neutral attitude towards improved agricultural implements. Due to their favorable attitude the farmers of the study area used power tiller, tractor, seed drill, deep tube well, shallow tube well, low lift pump, power thresher and so on, which were the indicator of farm mechanization. Favorable attitude means farmers of the study area use improved agricultural implements either they possess themselves on hire basis. During data collection the researcher observed that farmers possessed many implements like power tiller, tractor, BARI Rice weeder, power operated rice thresher, paddle thresher ,power sprayer, hand sprayer, rotavator, cultivator, power pump, power operated maize thresher, seed drill, shallow tubewell, deep tubewell, drum seeder etc. Above half of the farmers showed favorable attitude towards improved agricultural implements because two-third of the farmers were literate. Educated farmers were more innovative to receive the innovation than the others. They were more conscious about mechanization, low cost, high production, less time consuming.

Though mechanization is quite less in Bangladesh compared to other neighbouring countries, it is gaining place with time. Since Bangladesh is an agro-based country and a considerable share of her GDP comes from agriculture, this sector is always given due importance. Most importantly, the farmers are getting the realization that to save time and cost of operation and to do profitable agriculture, there is no other better option than to go for mechanized agriculture. Now, proper planning and positive intension from the higher authority is required. Despite all the developments and constraints, manual labour claims the highest input cost in rice production of the country, as it is still essential for transporting, weeding, harvesting, threshing , drying, and many other related activities. The farmers and rural entrepreneurs are trying to further mechanize some of these operations to reduce cost of production and time of operation. Highly coordinated research and extension among GO, NGO and private agricultural machinery manufacturers are required to support this process of mechanization.

#### **4.2 Selected Characteristics of the Farmers (Experimental variables)**

This section deals with the classification of the farmers according to their various characteristics. Behaviour of an individual is largely determined by his characteristics. These characteristics of an individual contribute to a great extent in the matter of shaping of his behaviour. In this section the findings on the farmer's nine selected characteristics have been discussed. The selected characteristics are (i) age, (ii) education, (iii) farm size, (iv) annual income, (v) knowledge about improve agricultural implements, (vi) innovativeness, (vii) social status, (viii) opinion leadership and (ix) interpersonal communication. Therefore; the major hypothesis of the study was that the attitude of farmers towards improved agricultural implements would also be influenced by various characteristics of the farmers. The observed and assigned score of the variables are presented in the following table 3:



**Table 3. Characteristics profile of the respondents**

Sl. No.	Characteristics	Measuring unit	Actual value		Mean value
			Minimum	Maximum	
01.	Age	Year	21	73	50.82
02.	Education	Score	0	16	6.34
03.	Annual family income	Taka ('000')	12	977	176.73
04.	Farm size	Hectare	0.05	2.11	0.67
05.	Knowledge	Score	4	30	16.44
06.	Innovativeness	Score	2	42	20.15
07.	Opinion leadership	Score	14	36	24.72
08.	Interpersonal communication	Score	8	47	34.69
09.	Social status	Score	12	39	26.19

**4.2.1 Age**

Score of age of the respondents ranged from 21 to 73 years, the average being 50.82 with standard deviation of 12.25. The respondents were classified into three categories on the basis of their age.

**Table 4: Distribution of farmers according to their age**

Categories	Farmers		Mean	SD
	Number	Percent		
Young (21-35years)	17	14.17	50.82	12.25
Middle aged (36-50 years)	41	34.17		
Old aged (Above 51 years)	62	51.66		
Total	120	100		

Data furnished in table 4 indicated that 14.17 percent of the respondents were young as compared to 85.83 percent being middle to old aged. Decision regarding the farming practices in the study area is, therefore, expected to be considerably influenced firstly by the old aged growers and then middle aged growers.



The findings indicate that a large proportion (57) of the farmers were young to middle aged. Young people are generally receptive to new ideas and things. They have a favorable attitude towards trying new ideas. But under the present study, old aged farmers (62 out of 120 farmers) showed the same attitude because of their longer farm experience might have valuable opinions in regard to decision making. The extension agents can make use of these views and opinion in designing their extension activities.

#### 4.2.2 Education

The education score of the respondents ranged from 0-16. Here, the average educational score was 6.34 with a standard deviation of 5.28. On the basis of, their education, the farmers were classified into four categories namely "illiterate/can sign only" (0-0.5), "primary" (1-5), "secondary" (6-10) and "above secondary" (> 10) shown in table 5.

**Table 5: Distribution of farmers according to their education level**

Categories	Farmers		Mean	SD
	Number	Percent		
Illiterate and can sign only (0-0.5)	45	37.5	6.34	5.28
Primary (1-5)	10	8.3		
Secondary (6-10)	39	32.5		
Above secondary (>10)	26	21.7		
Total	120	100		

Above one-third (37.5%) of the farmers were illiterate or could sign their name only, compared to 8.3% of them having primary level education. 32.5% of the

farmers had secondary education, while 26 percent had above secondary level of education. It means that about two-thirds (62.5%) of the respondents had primary to above secondary level of education. The findings indicated that education of an individual is likely to be more receptive to the modern facts and ideas; they have much mental strength in deciding on a matter related to problem solving.

Education helps an individual to gain new knowledge and skill which in turn enables him to give advice and information to others. Such considerations indicate that a considerable proportion of the farmers might have lower attitude towards improved agricultural implements.

Education helps the farmers to obtain useful information about improved technology of cultivation through reading leaflets, booklets, books and other printed materials in this case. The findings of this study, however, indicate that 37.5 percent of the growers had no schooling, they generally communicate with the Extension worker, NGO personnel, opinion leaders, village matobber and get the information about improved agricultural implements. Such consideration indicates the need for improving literacy level among the growers for enhancing adoption of improved practices with improved agricultural implements.

#### **4.2.3 Annual family income**

The score of annual family income of the respondents ranged from 12 to 977 . The mean was 176.73 with a standard deviation 167.46. Based on their income scores, the farmers were classified into three categories: "low income" (up to 240), "medium income" (241-480) and "high income" (above 481). The distribution of the farmers according to their family income is shown in Table 5.



**Table 6: Distribution of farmers according to their annual income**

Categories	Farmers		Mean	SD
	Number	Percent		
Low income (up to -240)	88	73.33	176.73	167.46
Medium income (241-480)	29	24.17		
High income (Above 481)	3	2.5		
Total	120	100		

From the above Table, it was observed that the highest portion (73.33%) of the respondents were low income group, while 24.17 percent respondents were medium income group and only 2.5 percent were high income group. Most of the farmers of the study area were low to medium income group. The average income of the farmers was much higher of the study area than national average income of the country (1044 US Dollar). This might be due to the fact that the farmers of the study area were not engaged in only agriculture. They earned from other sources such as service, business etc. Above all farm mechanization also contributed to their annual income.

#### **4.2.4 Farm size**

The farm size score of the respondents varied from 0.05 to 2.11 hectares. The average farm size was 0.67 hectare with a standard deviation of 0.564. The respondents were classified into the following three categories based on their farm size: small (up to 1.0 ha), medium (between 1.0 – 2.0 ha), and large (2.0 – 3.0 ha or above). The distribution of the farmers according to their farm size is shown in table 6.

**Table 7: Distribution of farmers according to their farm size**

Categories	Farmers		Mean	SD
	Number	Percent		
Small (up to 1.0 ha)	91	75.83	0.67	0.564
Medium (between 1.0-2.0 ha)	26	21.66		
Large (above 2.0 ha)	3	2.5		
Total	120	100		

Data presented in the table 7 show that the highest proportion (75.83 percent) of the growers had small farm compared to 21.66 percent having medium farm and only 2.5 percent had large farm. The overwhelming majority (97.49%) of the respondents were found to be small to medium. Small farmers generally cultivate the land of big farmers consequently, they gather practical knowledge and skill about the improved agricultural practices.

In order to have a reasonable standard of living and increasing crop production, the growers must adopt improved practices which could be followed by the fellow growers and it can be achieved with the help of developing knowledge and skill of the improved technologies.

#### **4.2.5 Knowledge about improved agricultural implements**

Knowledge score about improved agricultural implements ranged from 4 to 30 against the highest possible range 30, with a mean of 16.44 and standard deviation of 6.73. On the basis of knowledge score of the respondents were classified into three categories as follows "low knowledge" (0-10), "medium knowledge" (11-20) and "high knowledge" (21-30). The distribution of the farmers according to their agricultural knowledge is shown in Table 8.



**Table 8: Distribution of farmers according to their knowledge**

Categories	Farmers		Mean	SD
	Number	Percent		
Low knowledge (0-10)	29	24.17	16.44	6.73
Medium knowledge (11-20)	51	42.5		
High knowledge (21-30)	40	33.33		
Total	120	100		

The highest proportion (33.33 percent) of the farmers had high knowledge about improved agricultural implements compared to 24.17 percent had low knowledge and 42.5 percent had medium knowledge. In general the agricultural knowledge level of the farmers of the study area was quite satisfactory. This might be due to the fact that the respondents possessed more than average farm size and the literacy rate was also at national standard. The findings indicate that more than two third of the farmers had medium to high agricultural knowledge. These farmers may be capable of holding favorable attitudes towards improved agricultural implements.

#### **4.2.6 Innovativeness**

The innovativeness score of the respondents ranged from 2-41 against the highest possible score 56 with the average was 20.46 and the standard deviation was 9.04. Based on their innovativeness scores, the respondents were classified into three categories: “low innovativeness” (2-15), “medium innovativeness” (16-29) and “high innovativeness” (above 29). The distribution of the respondents according to their innovativeness is shown in Table 9.

**Table 9 : Distribution of farmers according to innovativeness**

Categories	Farmers		Mean	SD
	Number	Percent		
Low innovativeness (2-15)	51	42.5	20.15	9.12
Medium innovativeness (16-29)	66	55		
High innovativeness (above 29)	3	2.5		
Total	120	100		

Data contained in the Table. 9 indicate that highest proportion (55 percent) of the farmers had medium innovativeness as compared to 42.5 percent low innovativeness and only 2.5 percent high innovativeness. Data also revealed that more than two thirds (57.5 percent) of the respondent farmers of the study area had medium to high level of innovativeness. Conclusion can be drawn that the farmers of the study area were found to be literate, possess good land holding, high social status and high opinion leadership. So, reasonably they were likely to be innovativeness.

#### **4.2.7 Opinion Leadership**

The opinion leadership scores of the respondents ranged from 14 to 36 against the highest possible score 40; the average being 24.72 with a standard deviation of 6.22. The respondents were classified into the following three categories: “low” (10-20), “medium” (21-30) and “high” (31-40) as shown in table 11.



**Table 10 : Distribution of farmers according to their opinion leadership**

Categories	Farmers		Mean	SD
	Number	Percent		
Low (14-20)	37	30.83	24.72	6.22
Medium (21-27)	51	42.5		
High (above 27)	32	26.67		
Total	120	100		

Data presented in table 10 indicate that highest number (42.5 percent) of the respondents had medium opinion leadership. Almost the same proportion (26.67percent) of the respondents had high opinion leadership. Only 30.83 percent had low opinion leadership. Data presented in the Table 11 indicate that the respondent farmers were almost equally distributed as their opinion leadership. However, more than two-thirds of the respondents had medium to high level opinion leadership.

Rogers (2003) has rightly pointed out that opinion leadership is a fairly widespread trait even though it is especially concentrated in a few individuals. Influence is a matter of degree and should properly be viewed as a continuous variable, rather than as dichotomy of leaders and followers. Merton defined opinion leaders as men who exert personal influence upon a certain number of other people in certain situations. So, opinion leadership helps to increase attitude towards improved agricultural implements.

#### **4.2.8 Interpersonal communication**

Interpersonal communication score ranged from 8 to 47 against highest possible score 48 with an average of 34.69 and standard deviation of 7.73. Based on the interpersonal communication scores, the respondents were classified into the

following three categories: “low” (up to 22), “medium” (23-34) and “high” (35-47) showed in table 12:

**Table 11: Distribution of farmers according to their Interpersonal Communication**

Categories	Farmers		Mean	SD
	Number	Percent		
Low (up to 22)	9	7.5	34.69	7.73
Medium (23-34)	41	34.17		
High (35-47)	70	58.33		
Total	120	100		

Data presented in Table 11 indicate the highest proportion (58.33 percent) of the farmers had high interpersonal communication followed by low interpersonal communication (7.5 percent) and medium interpersonal communication (34.17percent). Interpersonal communication in rural Bangladesh is the only source of information exchange among farmers. The question is how extent they can communicate with the interpersonal channels. Farming is a time bound operational business. They have little time to call on others farmers, village matabbor etc. Some respondent farmers may be low in communication and other may be medium and high but for their own interest they communicate as and when necessary. The data indicate that respondents in the study area had good interpersonal view exchange.

Frequent and timely interpersonal communication increase farmer’s knowledge, skills and abilities regarding various aspects of crop production



#### 4.2.9 Social Status

The social status scores of the respondents ranged from 12 to 39 against the highest possible score 40. The average score was 26.19 with a standard deviation of 6.97. The respondents were classified into the following three categories: “low status” (10-20), “medium Status” (21-30) and “high status” (31-40) as shown in table 11.

**Table 12: Distribution of farmers according to their Social status**

Categories	Farmers		Mean	SD
	Number	Percent		
Low status (10-20)	29	24.17	26.19	6.97
Medium Status (21-30)	54	45		
High Status (31-40)	37	30.83		
Total	120	100		

Data presented in table 12 indicate that most of the farmers (45 percent) of the respondents had medium social status compared 24.17 percent of the respondents who had low social status and 30.83 percent high social status.

Social status described respondent’s farm size, educational level, annual income, innovativeness, social workers, arbitrator, decision maker, information source etc that helps to know their position in the society. It also helps him to know the improved practices and other new ideas relating to different agricultural aspects. Social status may, therefore, enable the farmers to cope with their improved agricultural implements use effectively.

#### **4.3 Relationships between the selected characteristics of the farmers and attitude towards improved agricultural implements**

Spearman rank correlation was computed in order to explore the relationship between the selected characteristics of the farmers and their attitude towards improved agricultural implements. The selected characteristics constituted independent variables and attitude of the farmers constituted the dependent variable.

As mentioned earlier, the nine characteristics of the farmers were the experimental variables of the study. The variables were: (i) age, (ii) education, (iii) farm size, (iv) annual income, (v) knowledge about improve agricultural implements, (vi) innovativeness, (vii) social status, (viii) opinion leadership and (ix) interpersonal communication.

The predicted variable was attitude of farmers towards improved agricultural implements. To explore the relationships, Spearman rank correlation co-efficient ( $r$ ) has been used to test the hypothesis concerning the relationships between two variables. Five percent, and one percent level of significance were used as the basis of acceptance or rejection of a hypothesis. The summary of the results of the correlation co-efficient between the selected characteristics of the farmers and their attitude towards improved agricultural implements has been shown in Table 13.



**Table 13. Co-efficient of correlation between the selected characteristics of the farmers and their attitude towards improved agricultural implements**

Selected characteristics of the farmers	Computed value of 'r'	Table value of 'r' of 118 degrees of freedom	
		0.05%	0.01%
Age	0.181*	±0.139	±0.182
Education	0.148 <sup>NS</sup>		
Annual income	0.024 <sup>NS</sup>		
Farm size	0.025 <sup>NS</sup>		
Knowledge about improve agricultural implements	0.340**		
Innovativeness	0.401**		
Opinion leadership	0.483**		
Interpersonal communication	0.296**		
Social status	0.326**		

NS = Non significant

\* = Significant at 0.05 level of probability

\*\* = Significant at 0.01 level of probability

#### **4.3.1 Relationship between age of the farmers and their attitude towards improved agricultural implements**

The relationship between age of the farmers and their attitude towards improved agricultural implements was examined by testing the following null hypothesis: "There is no relationship between age of the farmers and their attitude towards improved agricultural implements."

As shown in the Table 12 the co-efficient of correlation between the concerned variables was computed and found to be 'r' = 0.170 which led to the following observation.

- There was positive trend between the concerned variables.
- The computed value of 'r' (0.181) was larger than the table value ( $r = 0.139$ ) with 118 degrees of freedom at 0.05 level of probability.
- Hence, the concerned null hypothesis was rejected.
- The correlation co-efficient between the two concerned variables was significant at 0.05 level of probability.

Based on the above findings, the researcher concluded that the age of the farmers had a positive and significant relationship with their attitude towards improved agricultural implements. This indicated that the more the farmers were older, the higher were their attitude towards improved agricultural implements.

The findings of the present study support the studies conducted by Singh (1982). He observed, that attitude of farmers towards improved crop production technology of irrigated and non-irrigated groups were heavily skewed into favorable category. The age of the farmers was positively and significantly related to their attitude of the farmers of two groups.

#### **4.3.2 Relationship between the education of the farmers and their attitude towards improved agricultural implements**

The relationship between the education of the farmers and their attitude towards improved agricultural implements was examined by testing the following null hypothesis: "There is no relationship between education of the farmers and their attitude towards improved agricultural implements."





The co-efficient of correlation between the concerned variables was found to be ' $r$ ' = 0.148 as shown in Table 12. This led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a tendency in the positive direction between the concerned variables.
- The computed value of ' $r$ ' (0.148) was larger than the table value ( $r = 0.139$ ) with 118 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis could not be rejected.
- The correlation co-efficient between the two concerned variables was not significant.

The findings indicate that education of the farmers had no significant and positive relationship with their attitude towards improved agricultural implements. This indicated that the higher the formal education of the farmers was, the higher was their attitude towards improved agricultural implements.

Similar findings were also observed by Muttaleb (1995) and Paul (2001). They found that there was positive significant relationship between education of the farmers and their attitude towards improved cultivation.

#### **4.3.3 Relationship between annual family income of the farmers and their attitude towards improved agricultural implements**

The relationship between annual income of the farmers and their attitude towards improved agricultural implements was examined by testing the following null hypothesis: "There is no relationship between annual income of the farmers and their attitude towards improved agricultural implements."

Computed value of the co-efficient of correlation between annual income of the farmers and their opinion leadership was found to be ' $r$ ' = 0.024 as shown in Table

12. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a tendency in the positive direction between the concerned variables.
- The relationship between the concerned variables was very low.
- The computed value of 'r' (0.024) was found to be smaller than the table value ( $r = 0.139$ ) with 118 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis could not be rejected.
- The co-efficient of correlation between the concerned variable was not significant at 0.05 level of probability.

The researcher concluded that annual income of the farmers had a positive and no significant relationship with their attitude towards improved agricultural implements.

The present study supports the findings of the studies conducted by Hossain (2002) and he revealed that there was no significant relationship between attitude and annual family income in his study on attitude on Island farmers towards adoption of modern agricultural technologies.

#### **4.3.4 Relationship between farm size of the farmers and their attitude towards improved agricultural implements**

The relationship between farm size of the farmers and their attitude towards improved agricultural implements was examined by testing the following null hypothesis: "There is no relationship between farm size of the farmers and their attitude towards improved agricultural implements."

Computed value of the co-efficient of correlation between farm size of the farmers and their opinion leadership was found to be  $r = 0.025$  as shown in Table 12. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:



- The relationship showed a tendency in the positive direction between the concerned variables.
- A very low relationship was found between the two variables.
- The computed value of 'r' (0.025) was found to be smaller than the table value ( $r = 0.139$ ) with 118 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was accepted.
- The co-efficient of correlation between the concerned variable was not significant at 0.05 level of probability.

The findings imply that the farm size of the farmers had no significant relationship with their attitude towards improved agricultural implements as most of them are literate they understand the importance of farm mechanization.

The present study was supported by the findings of Hossain (2002). He found that there was no relationship between attitude and farm size in his study on attitude on Island farmers towards- adoption of modern agricultural technologies.

#### **4.3.5 Relationship between knowledge about improved agricultural implements of the farmers and their attitude towards improved agricultural implements**

The relationship between knowledge about improved agricultural implements of the farmers and their attitude towards improved agricultural implements was examined by testing the following null hypothesis: "There is no relationship between knowledge about improve agricultural implements of the farmers and their attitude towards improved agricultural implements."

Computed value of the co-efficient of correlation between knowledge about improve agricultural implements of the farmers and their attitude towards improved agricultural implements was found to be ' $r = 0.340$ ' as shown in Table



12. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a positive trend.
- A very low relationship was found between the two variables.
- The computed value of 'r' (0.340) was found to be greater than the table value ( $r = 0.182$ ) with 118 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variables was significant at 0.01 level of probability.

The researcher concluded that the knowledge about improve agricultural implements of the farmers had positive significant relationship with their attitude towards improved agricultural implements.

Similar observations found by Koch (1985) and Hoque (2001) and they found that more agricultural knowledge is positively correlated to the attitude of farmers towards improved agricultural technologies.

#### **4.3.6 Relationship between innovativeness of the farmers and their attitude towards improved agricultural implements**

The relationship between innovativeness of the farmers and their attitude towards improved agricultural implements was examined to the following null hypothesis: "There is no relationship between Innovativeness of the farmers and their attitude towards improved agricultural implements."

The co-efficient of correlation between the concerned variables was found to be 'r' = 0.401 as shown in Table 13. This led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- A very low relationship was found to exist between the two variables.
- The computed value of 'r' (0.401) was greater than the table value ( $r = 0.139$ ) with 118 degrees of freedom at 0.05 level of probability.
- Hence, the concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variables was significant at 0 .05 level of probability.

The present study was not supported by Hossain (2002). He observed that significant relationship between attitude and innovativeness of farmers towards adoption of modern agricultural technologies. The innovativeness of the respondent farmers and their attitude towards improved agricultural implements had no significant relationship but founded to be significant. Conclusion could be drawn that innovative of the farmers did not affect their attitude toward improved agricultural implements.

#### **4.3.7 Relationship between Opinion leadership of the farmers and their attitude towards improved agricultural implements**

The relationship between opinion leadership of the farmers and their attitude towards improved agricultural implements was examined to the following null hypothesis: "There is no relationship between Opinion leadership of the farmers and their attitude towards improved agricultural implements."

The co-efficient of correlation between the concerned variables was found to be 'r' = 0.483 as shown in Table 12. This led to the following observations were recorded regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- A moderate relationship was found between the concerned variables.



- The computed value of 'r' (0.483) was greater than the table value ( $r = 0.182$ ) with 118 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

The list implies that opinion leadership of the respondent farmers had positive and significant relationship with their attitude towards improved agricultural implements. Opinion leadership is an important social phenomenon in a rural social system. Farmers in general ask advice or suggestion from opinion leaders about adoption of improved agricultural practices or of social issues. Social life becomes lively when opinion leaders interfere farmers daily socioeconomic business.

#### **4.3.8 Relationship between interpersonal communication of the farmers and their attitude towards improved agricultural implements**

The relationship between Interpersonal communication of the farmers and their attitude towards improved agricultural implements was examined by testing the following null hypothesis: "There is no relationship between interpersonal communication of the farmers and their attitude towards improved agricultural implements."

Computed value of the co-efficient of correlation between Interpersonal communication of the farmers and their attitude towards improved agricultural implements was found to be ' $r = 0.296$ ' as shown in Table 12. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a positive trend.
- A low relationship was found between the two variables.

- The computed value of 'r' (0.296) was found to be greater than the table value ( $r = 0.182$ ) with 118 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

Thus, the researcher concluded that the interpersonal communication of the farmers had positive significant relationship with their attitude towards improved agricultural implements.

Similar observations found by Bhaskaran *et al.* (1985) and they showed that the economic status and adoption were significantly correlated with interpersonal communication in less progressive village. In case of progressive village media participation, management, orientation and adoption were significantly correlated with the farmers Interpersonal Communication Behaviour Efficiency Index (ICBEI).

#### **4.3.9 Relationship between Social status of the farmers and their attitude towards improved agricultural implements**

The relationship between social status of the farmers and their attitude towards improved agricultural implements the following null hypothesis was tested "There is no relationship between social status of the farmers and their attitude towards improved agricultural implements."

The co-efficient of correlation between the concerned variables was found to be 0.326 as shown in Table 12. This led to the following observations regarding the relationship between the two variables under consideration:



- The relationship showed a tendency in the positive direction between the concerned variables.
- The relationship between the concerned variables was low.
- The computed value of “r” (0.326) was greater than the table value ( $r= 0.182$ ) with 118 degrees of freedom at 0.01 level of probability.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.
- The null hypothesis was rejected.

The findings demonstrate that the social status of the farmers had significant and positive influence on their attitude towards improved agricultural implements. It means that farmers with higher social status had high attitude towards improved agricultural implements.



# Chapter 5

## Summary and conclusion





## CHAPTER 5

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Summary

Agriculture is the main stay of economy of Bangladesh. To feed her 150 million people from 8.2 million hectares of cultivable land is a tough task (Hossain, 2012). Every year almost 0.20 million people are being added to the total population where the estimated annual shrinkage of agricultural land is about 0.08 million hectares due to various non-agricultural activities like constructions of houses, offices, roads, mills, factories etc.(BRRI, 2009). The contribution to GDP by agriculture is about 18.70%, of which crops, livestock, fisheries, and forestry account for 10.25%, 2.45%, 4.37% and 1.63% respectively (BBS, 2012-13). The country's food production has increased from 11.0 million tons in 1971 to about 30 million tons in 2012 (Hossain, 2012). The country is at present, about to achieve self sufficiency in cereal production. This is due to irrigation development and partial mechanization in other agricultural operations. But to meet up the food requirements of the over growing population of the country in 2015, an additional 5 million tons of food grain need to be produced from the continuously decreasing agricultural lands.

Agricultural research all over the world has developed useful technologies which, if used by the farmers in cultivation, will enormously increase agricultural production. However, Morill (1968), reports that the farmers who are the backbone of the nation, are mostly illiterate and traditional, they are often skeptical towards new ideas and practices in agriculture, they often become frustrated with new practices in agriculture due to lack of proper understanding of

the relevant factors. Therefore, the prerequisite for agricultural development is the communication of the benefit and know-hows of improved agricultural practices among the farmers so that they move forward to use them in production of crops.

Rural development depends not only on technology generation but also on dissemination of technology as per the needs of the target groups in a particular farming system (Mettric, 1993). For effective dissemination of generated technology, the combined effort of extension personnel along with attitude of farmers towards improved agricultural implements is vital.

There are some people in the rural areas with experience and adopted to new areas and ideas. Farmers go to them for opinion and advice. Activities of the farmers are, to a great extent, influence by the innovated people from whom they seek information and advice. Agricultural extension work in the rural areas will be greatly facilitated if the extension agents can utilize the interested people with new technology will enable each extension agent to multiply himself many folds. Moreover, extension programmes will receive greater acceptance and participation of the people if their leaders are involved in those programmes.

Extension workers need to know the attitude towards improved agricultural implements exhibited by the farmers. For a clear insight, one also needs to ascertain if the characteristics of the farmers are associated with their opinion. Since attitude of farmers towards improved agricultural implements play a crucial role in the implementation of new technologies, it is important to study their communication behavior (Rogers, 1983).



## **5.2 Specific objectives**

The following specific objectives were formulated for giving direction to the study :

- 1) To determine the strength of attitude of farmers towards improved agricultural implements
- 2) To identify and describe following characteristics of the farmers :
  - Age
  - Education
  - Annual income
  - Farm size
  - Knowledge about agricultural implements
  - Innovativeness
  - Opinion leadership
  - Inter personal communication
  - Social status
- 3) To explore the relationship of selected characteristics of the farmers with their attitude towards improved agricultural implements.

## **5.3 Methodology**

The study was conducted in Upazilla sadar under Jamalpur district. Therefore, the number of total farm families was 1204. Considering that the non-agricultural and landless families had no significant attitude of farmers towards improved agricultural implements, these were kept aside during data collection. Thus heads of 120 farm families constituted the respondent for data collection.



In order to collect relevant data from the respondents an interview schedule was prepared keeping the objectives of the study in mind. Both open and closed form questions were use in collecting data. Simple and direct question were included in the schedule to ascertain four characteristics of the farmers, namely, age, education, farm size and income. The schedule also contains five scales for measuring five characteristics namely, agriculture knowledge, innovativeness, opinion leadership, social status and interpersonal communication. Four socimetric questions were included in the schedule to determine the attitude of the farmers towards improved agricultural implements.

Data collected were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. Qualitative data were quantified by means of suitable scoring techniques. In order to explore the relationships of the selected characteristics of the growers with their opinion leadership, the Spearman rank Correlation Co-efficient was computed. Correlation matrix were also computed to determine the inter relationships among the variables. Five percent (0.05) and one percent (0.01) level of significance was used as the basis of rejecting any null hypothesis. Co-efficient values significant at 0.05 level is indicated by single asterisk (\*) and at 0.01 level by double asterisks (\*\*).

#### **5.4 Summary of Findings**

The major findings of the study are summarized below:

##### **5.4.1 Selected characteristics of the farmers**

Nine individual characteristics of the farmers were selected for investigation in this study. The findings of nine characteristics of the farmers are summarized below:

#### **5.4.1.1 Age**

The age of the farmers ranged from 21 to 73 years. The average age was 50.82 years with a standard deviation of 12.25. Highest proportions (51.66 percent) of the farmers were old aged category as compared to 14.17 percent being young and 34.17 percent middle aged.

#### **5.4.1.2 Education**

Education of the farmers ranged from 0 to 16. The average score being 6.34 and the standard deviation was 5.28. The highest proportion (37.5 percent) of the farmers were illiterate and can sign only compared to 32.5 percent having “secondary education”, 8.3 percent having “primary education” and only 21.7 percent having “above secondary education”.

#### **5.4.1.3 Annual family income**

Annual family income scores of the farmers ranged from 12 thousand to 977 thousand with an average of 176.73 thousand and the standard deviation was 167.46. The highest proportion (73.33 percent) of the farmers had Low income compared to 24.17 percent under Medium income and only 2.5 percent under high income categories.

#### **5.4.1.4 Farm size**

Farm size of the farmers ranged from 0.05 to 2.11 hectares with an average of 0.67 and the standard deviation was 0.564. The highest proportion (75.83 percent) of the farmers had small farm size compared to 21.66 percent having medium farm size, 2.5 percent having large farm size.



#### **5.4.1.5 Knowledge about improved agricultural implements**

Knowledge about improved agricultural implements scores of the farmers ranged from 4 to 30 with an average of 16.44 and the standard deviation of 6.73. The (33.33 percent) of the farmers had High knowledge as compared to 24.17 percent Low knowledge and only 42.5 percent with low Medium knowledge about improved agricultural implements.

#### **5.4.1.6 Innovativeness**

The innovativeness scores of the farmers ranged from 2 to 41 with an average of 20.46 and the standard deviation of 9.04. The highest proportion (55 percent) of the farmers had medium innovativeness as compared to 42.5 percent having low innovativeness and only 2.5 percent having high innovativeness.

#### **5.4.1.7 Opinion leadership**

Opinion leadership scores of the respondent ranged from 14 to 36 with an average of 24.72 and the standard deviation of 6.22. The highest proportion (42.5 percent) of the farmers had Medium opinion leadership while 26.67 percent had High opinion leadership and only 30.83 percent had Low opinion leadership.

#### **5.4.1.8 Interpersonal communication**

The Interpersonal communication scores of the farmers ranged from 8 to 47. The average Interpersonal communication score was found to be 34.69 with a standard deviation of 7.73. The highest proportion (58.33 percent) of the respondents had High interpersonal communication compared to 34.17 percent having Medium and only 7.5 percent having Low Interpersonal communication.



#### **5.4.1.9 Social status**

Social status scores of the farmers ranged from 12 to 39 with an average of 26.19 and the standard deviation was 6.97. The highest proportion (45 percent) of the farmers had Medium Status compared to 30.83 percent had High Status and only 24.17 percent had Low status categories.

#### **5.5 Relationship between the selected characteristics of the farmers with their attitude towards improved agricultural implements**

Nine null hypotheses were developed and tested to explore the relationship between nine selected characteristics of the farmers and their attitude towards improved agricultural implements. Correlation analysis indicated that six out of nine experimental variables namely age, knowledge about improved agricultural implements, innovativeness, opinion leadership, interpersonal communication, social status had significant positive relationship with the attitude towards improved agricultural implements. Other variables namely education, annual family income and farm size had no significant relationship with their attitude towards improved agricultural implements.

#### **5.6 Conclusions**

Findings of the study and the logical interpretations of their meaning in the light of other relevant facts prompted the researcher to draw the following conclusions:

- I. The study revealed that 61 percent of the farmers possessed favorable attitude towards improved agricultural implements whereas unfavorable attitude was confined to only 41.7 percent of the farmers. From the findings it may be concluded that attitude of farmers towards improved agricultural

implements was more or less widespread trait and that high attitude towards improved agricultural implements was concentrated to a large number of persons. In other words, the person who held attitude on improved agricultural implements on different aspects was more careful to the modern technologies. From the findings it was concluded that attitude towards improved agricultural implements among the farmers of Jamalpur sadar was polymorphic in nature.

- II. Age of the farmers had a positive and significant relationship with their attitude towards improved agricultural implements. It may, therefore be concluded that relatively older people would exhibit higher attitude towards improved agricultural implements to a higher extent than the younger people. So, older people are to be in technology diffusion programs of extension service.
- III. Education of the farmers showed that there was positive and non- significant relationship with their attitude towards improved agricultural implements. From the findings it could be drawn up to a certain level is a prerequisite to function as positive attitude to the expected areas effectively.
- IV. Farm size of the farmers had no significant but a positive relationship with their attitude towards improved agricultural implements. It was observed that attitude of farmers towards improved agricultural implements was the highest among the farmers with small farms. These farmers generally have higher attitude towards improved agricultural implements to improve their socio-economic condition with increasing income and contact with various sources of information.



- V. Annual income of the farmers showed no significant and positive relationship with their attitude towards improved agricultural implements. But it plays a positive role and they held favorable attitude towards improved agricultural implements. Therefore, it can be concluded that low income generating people was higher among the selected farmers.
- VI. Farmer's Knowledge about improved agricultural implements had a significant positive relationship with their attitude. Bangladesh is an agricultural country. Obviously, farmers having high agricultural knowledge will be in a better position to give advice and information to others. It may, therefore, be concluded that arrangement made for improving the knowledge on improved agricultural implements will greatly facilitate dissemination of agricultural information among the farmers.
- VII. Innovativeness of the farmers had a significant and positive relationship with their attitude towards improved agricultural implements. It was observed that attitude towards improved agricultural implements was the highest among the farmers with medium innovativeness. A farmer comes forward to accept an innovation when he understands the benefits and know-hows of that innovation.
- VIII. The findings of the study suggested that a strong and positive relationship was existed between social status and attitude towards improved agricultural implements. Farmers with higher social status was connected to other people at various purpose and visit places outside their village and thus come in contact with new people and new ideas. It may be concluded that social status is a precursory factor to facilitate strong attitude phenomenon towards improved agricultural implements.



- IX. The findings of the study possessed that a strong and positive relationship held between opinion leadership of the farmers and their attitude towards improved agricultural implements. From the findings it may be concluded that opinion leadership was more or less extensive trait and that high opinion leadership was more effective to increase strong attitude towards improved agricultural implements.
- X. Interpersonal communication of the farmers had significant and positive relationship with their attitude towards improved agricultural implements. Farmers with higher interpersonal communication can effectively create strong attitude towards improved agricultural implements. From the findings it could be infer that Interpersonal communication level is a prerequisite as positive attitude to the expected areas effectively.

## **5.7 Recommendations**

### **5.7.1 Recommendations for policy implications**

Based on the findings and conclusions of the study, the following recommendations are presented below:

- I. The study revealed that attitude of farmers towards improved agricultural implements was an important issue though strong attitude concentrated to a few persons. Further it indicated that attitude towards improved agricultural implements was polymorphic in nature. It is, therefore, strongly recommended that farmers having strong attitude towards improved agricultural implements need to be involved in programme planning and its

execution in the area concerned. Such involvement of improved agricultural implements, will work as catalyst to bring about the desired change.

- II. Existence of a positive relationship between age of farmers and attitude towards improved agricultural implements may provide a basis to recommend relatively young farmers be selected for improved technology dissemination through farmers training. On being trained, these farmers may be effectively used in the implementing change programmes in the locality.
- III. In view of the positive relationship between formal education and positive attitude towards improved agricultural implements, it is necessary that the change agents should consider the education of individuals while going to involve people as local leaders in the change programmes.
- IV. Considering the importance of education for improved agricultural technologies, it is recommended that adult literacy programmes should be introduced in the rural areas for development of rural community and leadership.
- V. Use of agricultural information sources by the opinion leaders has been found to be low. Consequently it will not be possible for the opinion leaders to advice effectively to the farmers about the improved agricultural practices. Therefore, steps should be taken to improve the present communication process of agricultural information among the rural people by developing appropriate strategy.
- VI. In order to use the improved agricultural implements as effective tools for dissemination of agricultural information, it is necessary to pay proper attention to improve their agricultural knowledge.



- VII. There is need for establishing various kinds of organizations in the rural areas according to the needs of the farmers. Such organizations will help to disseminate improved agricultural technologies among the farmers.
- VIII. In view of the consistent positive relationship between different farm size of the farmers and their attitude towards improved agricultural implements, improved technologies should be initiated according to their socio-economic condition and farm size which can be adopted as cost effective. It is recommended that DAE should undertake a program of farm mechanization throughout the country. It is further recommended that farm mechanization should be incorporated in the upazila annual agriculture development plan.
- IX. Extension workers need to provide adequate information about the benefits and know-how of agricultural innovations among the farmers to develop innovativeness which, in turn, help development of opinion leadership.
- X. Social status can be considered for increasing attitude of farmers towards improved agricultural implements for developing respected person as local leader who will be accepted person to the local people. High social status holders have influence upon their own social system. They help farmers in their decision making like optional decision, collective decision and authoritative decision as well. DAE can help of high social status holders in attitude change of farmers towards improved agricultural implements. Therefore, it is recommended that DAE should give values to local high social status holders in diffusion of farm implements.
- XI. Extension workers will develop strong interpersonal communication with the local people so that improved agricultural technologies can disseminate

easily by improving positive attitude towards improved agricultural implements.

- XII. A careful analysis of the factors that affect attitude of farmers towards improved agricultural implements, as has been revealed by the present investigation the extension worker may locate who are the opinion leaders in his area. This will, no doubt save time and energy of the extension workers to get them involved in implementing extension programmes effectively.

Finally the investigator of the study believes that the concept, ideas, and nature of innovated farmers derived from the study will be helpful not only to the extension workers but also to the extension policy makers and programme planners.

#### **5.7.2 Recommendations for further study**

A small piece of study as has been conducted cannot provide all information for the proper understanding of the attitude of farmers towards improved agricultural implements. Therefore, the following suggestions are made for further study.

- I. The present investigation explored the relationships of the nine characteristics of the farmers with their attitude towards improved agricultural implements. Further research may be conducted by taking other characteristics to observe relationships with their attitude towards improved agricultural implements.
- II. The present study was conducted in one area under Jamalpur district. So, similar studies may be undertaken in other parts of the country to verify the findings of the present study and in order to have a better understanding about improved agricultural implements in the rural areas.



- III. This study examined the relationship of the farmers' characteristics with their attitude towards improved agricultural implements. There is need for exploring the relationships of the characteristics with improved agricultural implements in different areas separately.
- IV. Education, farm size, and annual family income of the farmers are likely to considerably influence their attitude towards improved agricultural implements. But this study did not reveal any significant relationship of education, farm size, annual income with attitude towards improved agricultural implements. The findings need further verification.
- V. The present study has been carried out among the male farmers only. So, a similar study may be conducted with the farm women to examine their attitude towards improved agricultural implements.
- VI. Research is necessary to formulate principles and procedures to involve improved agricultural implements with increasing attitude towards it through opinion leaders in extension educational programmes effectively.



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# Appendices

## Appendix -1

( Questionnaire (English version) for the Study of “Attitude of farmers towards improved agricultural implements”)

Department of Agricultural Extension & Information System  
Sher-e-Bangla Agricultural University, Dhaka- 1207

### **An Interview Schedule for the Study of “Attitude of farmers towards improved agricultural implements”**

(Please answer the following questions and put-check mark whenever application)

Name: ..... Sample No : .....

Father’s Name/Husband’s Name: .....

Village: ..... Union: ..... Dist: .....

#### **1. Age**

How old are you? ..... Years.

#### **2. Level of education**

Please mention your education status

- a) Can’t read and write (    )
- b) Can sign only (    )
- c) Attended Class up to (    )



**03. Annual Family Income:**

Please furnish your family annual income from different sources :

Sl. No	Sources of income	Area	Production	Income	Total amount in (Tk)
01.	Agriculture				
a	Rice				
b	Wheat				
c	Maize				
d	Jute				
e	Pulse				
f	oilseed				
02.	Livestock				
a	Milk				
b	Meat				
c	Egg				
03.	Fisheries				
04.	Hatchery and poultry				
05.	Business				
06.	Services				
07.	others				
Total					

#### 04. Farm Size:

Please mention the area of your land according to tenure status

SL.NO.	Type of land use	Area of land	
		Local unit	Hectare
a.	Homestead		
b.	Own land under own cultivation		
c.	Land given to others on barga		
d.	Land taken to others on barga		
e.	Land taken from others on lease		
f.	Pond		
g.	Orchard		
	Total=		

## 5. Knowledge about improved agricultural implements:

Please answer to the following questions.

SL.NO.	Questions	score	
		Full Marks	Marks obtained
01.	Mention the importance of farm mechanization.	2	
02.	Mention a list of improved tillage implements.	2	
03.	What is the efficiency of power tiller per hour?	2	
04.	What is the efficiency of tractor per hour?	2	
05.	How much modern implements can reduce labor cost?	2	
06.	In what type of farm power sprayer can be used for rice field?	2	
07.	What type of power sprayer can be used for mango tree?	2	
08.	What type of weed can be controlled by BARI Rice weeder?	2	
09.	What is the efficiency of power pump per hour?	2	
10.	How can you sow seed in a definite depth of soil and save 10-14% of seed?	2	
11.	What are the main parts of a seed drill?	2	
12.	Mention the time requirements to sow seed in one bigha of land by seed drill?	2	
13.	Mention the main function of rotavator.	2	
14.	Mention the name of rice thresher.	2	
15.	Mention the diversified use of power tiller.	2	



## 06. Innovativeness :

How long have you been using the following improved implements?

SL.NO.	Implements	Degree of earliness of use				
		Used within 1 year after hearing	Used within 1-2 years after hearing	Used within 2- 3 after hearing	Used after 3 years of hearing	Never used
		4	3	2	1	0
01.	Power tiller					
02.	Tractor					
03.	BARI Rice weeder					
04.	Power operated rice thresher					
05.	Paddle thresher					
06.	Power sprayer					
07.	Hand sprayer					
08.	Rotavator					
09.	Cultivator					
10.	Power pump					
11.	Power operated maize thresher					
12.	Seed drill					
13.	Shallow tube-well					
14.	Deep tube-well					

**07. Opinion leadership :**

Please mention your degree of opinion leadership by putting tick mark against appropriate degree.

SL.NO.	Items	Extent of leadership			
		Regularly (4)	Occasionally (3)	Rarely (2)	Not at all (1)
01.	Suggests fellow farmers to use improved agricultural implements.				
02.	Suggests farmers about repairment of implements that are out of market.				
03.	Advices fellow farmers on selection of crop seed.				
04.	Advices fellow farmers on intercultural operation.				
05.	Advices fellow farmers on marketing of agricultural produces.				
06.	Advices neighbors and peer groups about matrimonial fairs.				
07.	Delivers necessary information.				
08.	Conducts result demonstration.				
09.	Extension worker gives more value.				
10.	Adopt innovation earlier than other member of the social system.				

**08. Interpersonal communications:****To what extent do you contact with the following information sources?**

SL.NO	Sources of communication	Nature of contact				
		Regularly (4)	Often (3)	Occasionally (2)	Rarely (1)	Not at all (0)
01.	Upzilla level officer(UAO,AAO,AEO)					
02.	Sub Assistant Agriculture officer(SAAO)					
03.	NGO Personnel					
04.	Union parishad Chairman					
05.	Union parishad Member					
06.	Progressive farmer					
07.	Seed/fertilizer/insecticide dealer					
08.	Modern agriculture instrument dealer					
09.	Neighbors/relatives/friends					
10.	School teachers/Imam of mosq					
11.	Village Matabbors					
12.	Youth leader					



**09 . Social status:**

How extent the following status items ensure your social status?(put tick marks against the appropriate degree)

Sl.NO.	Status items	Degrees of status			
		High status (4)	Moderate status (3)	Low status (2)	Very low status (1)
01.	Farm size				
02.	Educational level				
03.	Annual family income				
04.	Leadership reputation				
05.	Innovativeness				
06.	Arbitrator				
07.	Social worker				
08.	Decision maker				
09.	Common adviser				
10.	Information source				

### 10. Attitude towards improved agricultural implements:

What is your agreement with the following statement?

SL.NO.	Attitudinal statements	Frequency of agreement (%)				
		SA (5)	A (4)	U (3)	D (2)	SD (1)
01(+)	Improved tillage implements pulverize soils properly that create good germination condition of crop seeds.					
02(-)	Tillage by tractor or power tiller create hard pan in the soil.					
03(+)	Tillage with improved implements make up soil down and bottom soil up that increases the soil fertility.					
04(-)	Tillage implements like power tiller and tractor are expensive, so, marginal farmers are unavailable to purchase these implements.					
05(+)	During pulverization of soil harmful insects come out and killed by sunlight and predators/birds.					
06(-)	Difficult to arrange bank loans for marginal/small farmers.					
07(+)	Use of rotavator saves time and cost in puddling soil for rice cultivation.					
08(-)	Farmers must be careful when weeder is used between two rows particularly in dry land.					
09(+)	Land preparation by using cultivator is suitable for sugarcane transplanting.					
10(-)	Deep tubewell water causes arsenic problem.					
11(+)	Use of power operated thresher does not hamper quality of grains.					
12(-)	Parts of implements sometimes unavailable in the market.					

SL.NO.	Attitudinal Statements	Frequency of agreement(%)				
		SA (5)	A (4)	U (3)	D (2)	SD (1)
13(+)	Large area can be irrigated by deep tube-well.					
14(-)	Sowing by drum seeder may cause weed infestation in the soil.					
15(+)	By the use of drum seeder, germinated seed can be sown directly in clay soil.					
16(-)	At least four people require operating power maize thresher.					
17(+)	Power operated maize thresher has high capacity, which reduces the cost.					
18(-)	Sowing by seed drill maintenance of row to row distance is difficult.					
19(+)	Paddle thresher can be made at local industry.					
20(-)	Threshing by paddle thresher require hard labor and more energy.					

Thank you for your cooperation  
 Signature of Interviewer-----  
 Date:





**Appendix-2**  
**Correlation Matrix**

**N=120**

	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	Y
X <sub>1</sub>	-									
X <sub>2</sub>	-.044	-								
X <sub>3</sub>	-.005	.405**	-							
X <sub>4</sub>	.059	.648*	.503**	-						
X <sub>5</sub>	.050	.668**	.156	.440**	-					
X <sub>6</sub>	.156	.548**	.060	0.356**	0.743**	-				
X <sub>7</sub>	.138	.605**	.120	0.448**	0.790**		-			
X <sub>8</sub>	.230*	.521**	.146	0.373**	0.624**	.679**	.651**	-		
X <sub>9</sub>	.148	.746	.301**	0.661**	0.786**	0.740**	.796**	.706**	-	
Y	.181*	0.148	0.024	0.025	0.390**	0.401**	.483**	.296**	.326**	-

X<sub>1</sub> = Age

X<sub>2</sub> = Education

X<sub>3</sub> = Annual family income

X<sub>4</sub> = Farm size

X<sub>5</sub> = Knowledge about improved agricultural implements

X<sub>6</sub> = Innovativeness

X<sub>7</sub> = Opinion leadership

X<sub>8</sub> = Interpersonal communication

X<sub>9</sub> = Social status

Y = Attitude towards improved agricultural implements

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