

**ATTITUDE OF FARMERS TOWARDS MAIZE CULTIVATION IN
DINAJPUR SADAR UPAZILLA**

A Thesis

By

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**Master of Science
In
Agricultural Extension**

**Department of Agricultural Extension
Hajee Mohammad Danesh Science and Technology University
Dinajpur**

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The author

ATTITUDE OF FARMERS TOWARDS MAIZE CULTIVATION IN DINAJPUR SADAR UPAZILLA

ABSTRACT

The main purpose of the study was to determine attitude of farmers towards maize cultivation. The study was carried out in Chehelgazi unions of Sadar upazilla under Dinajpur District. Ninety two (92) farmers were selected as sample from an updated list of 920 farmers' involved in maize cultivation. Data were collected by a pre-tested interview schedule during 15 September to 15 October 2017. Simple and direct questions with different scales were used to obtain information. Co-efficient of correlation (r) was computed in order to explore the relationships between the nine selected characteristics of the farmers and their attitude towards maize cultivation. About three-fourths (73.9 percent) of the farmers had highly favorable attitude towards maize cultivation while 26.1 percent moderately favorable attitude and 0.00 percent had slightly favorable attitude towards maize cultivation. Correlation analyses indicated that among nine selected characteristics education, farm size, cosmopolitaness and extension media contact of the farmers had positive significant relationships with their attitude towards maize cultivation. However, age, family size and area under maize cultivation, annual income and training received had no significant relationships with their attitude towards maize cultivation. 'Cost of maize cultivation is high than other crops' (78.26 percent) emerged as the 1st ranked problem and last ranked (25 percent) perceived problem mentioned by the farmer was 'Lack of knowledge on hybrid maize variety' expressed by the farmers. The foremost (56.52 percent) suggestion cited by the farmers was 'organizing more training program for the farmers' and 'Application of IPM technique' (28.26 percent) was last suggestion.

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CHAPTER 1

INTRODUCTION

1.1 General Background

Agriculture sector is mainly dominated by crop subsector and rice is the main food crop in Bangladesh. In Financial Year 2014-15, the total amount of food crop production in Bangladesh was 38.42 million metric tons in which rice production alone was 34.71 million metric tons. This indicates the importance of rice in Bangladesh agriculture. Compared to rice, production of other food crops- maize and wheat, were 2.36 million metric tons, and 1.34 million metric tons, respectively (BBS, 2016). Although the total production of food is increasing in Bangladesh, the country still faces significant food security challenge as the production of food crops is not diversified. This leads to suffering of people from extremely high rate of chronic and acute malnutrition in the country, especially among the women and children (Rich *et al.*, 2015). Lack of crop diversity results in shortage of some specific food crops which the country needs to import from abroad (Chowdhury *et al.*, 2013). For example, Bangladesh imported a total of 2.79 million metric tons food crop in Financial Year 2015-16 (BBS, 2016).

In this circumstance, it has been increasingly realized that for the betterment of Bangladesh economy a real breakthrough in crop diversity is necessary (Baksh, 2003). Maize may be helpful to improve this situation although it is relatively a new crop in Bangladesh (Rahman *et al.*, 2013). During the 1970-80s, a few thousand hectares of land was cultivated for maize production (Ali *et al.*, 2009). After the establishment of BARI (Bangladesh Agricultural Research Institute) in 1976, researchers and government felt the potentiality of maize production in Bangladesh (Ali *et al.*, 2008). According to CIMMYT (2009), maize is very well- suited to the country's fertile alluvial soil and can be grown almost any time, except for the rainy season. From 2000, maize became a lucrative cash crop particularly to the farmers of northern and western part of Bangladesh boosted by huge and expanding market demand for it. Thus, the area under maize cultivation has quickly increased to 804 thousand acres of land in Financial Year 2014-15 from 72 thousand acres in Financial Year 2003-04 (BBS, 2015). The advantages of maize lie in its higher yield rate and higher profitability compared to the other two major cereal crops: Boro (irrigated) rice and wheat (BBS, 2012). Widespread use of fertilizer along with modern irrigation facilities has ensured high yield of maize production with a national mean yield of around 6.58 ton/hectare (BBS, 2012).

However, in reality this sort of studies regarding maize production is very scant in our country. Therefore, this research takes in Bangladesh, hybrid maize is grown mostly in the winter (Rabi) season (November- March) after the harvest of Transplanted. aman rice. Additionally, more area is coming under maize production in the post winter (Kharif) season (February-May), mainly after the harvest of potato (Ali *et al.*, 2009). Following this, farmers in Dinajpur District also cultivate maize in the above two seasons, Rabi and Kharif under two cropping patterns. Another cropping pattern is also found in the study area under which maize is cultivated after harvesting wheat or mustered but this is insignificant considering very low coverage of land and its amount of production. Therefore, this study mainly concentrated on the Rabi and Kharif season maize production ignoring the other pattern. It is interesting to note here that farmers use different level of inputs combinations in these two cropping patterns, and as a result production also varies significantly.

1.2 Justification of the Study

The major focus of the study is to assess attitude of the farmers towards maize cultivation in Dinajpur Sadar Upazilla. Attitude of an individual on certain aspect serves as a driving force for constant efforts on certain perceived action. Maize became a profitable cash crop particularly to the farmers of northern Bangladesh. Unless the farmers of Bangladesh have sufficient knowledge and favorable attitude towards maize cultivation would be practically impossible to achieve desirable development in the field of agriculture. However, very few researches have so far been conducted in Bangladesh in the social and psychological aspects of agricultural crop production. More than seventy percent people of Bangladesh live in rural areas and their main livelihood is agriculture. It is, therefore, necessary to undertake a research study to ascertain ‘attitude of the farmers towards maize cultivation in Dinajpur Sadar Upazilla’.

1.3 Statement of the Problem

Maize cultivation in Bangladesh has been increased through various interventions of the MOA, BARI, and Crop Diversification Program. DAE-IMPP, BRAC, BADC and so many private organizations. At present various type of hybrid varieties are available in Bangladesh such as Pacific-11, Pacific -60, Kiron, Uttaron etc. Cultivation of hybrid maize has gained extensive popularity resulting increase of area and production. Area of maize cultivation has increased to about 50,050 hectare with annual production of 2, 41,460 m. tons grain in 2003-04 from merely 4,075 m. tons from 3,161 hectare in 1999-00 (Masud, 2007).

Improving maize production is considered to be one of the most important strategies for food security in Bangladesh. In the face of growing food consumption and changing food habit of the people, maize has potential role to play as a food crop in Bangladesh. People can consume maize by different ways and in terms of human consumption, maize occupies important position in the food chain after rice and wheat. Maize is also used in food baking and cattle feed industries in Bangladesh. Although the demand for maize is increasing day by day, its production is still below the required level. So, it is important to expand the area under maize cultivation for ensuring the food security and promoting sustainable development of agriculture in Bangladesh. This also demands the need of knowing more information about maize production along with the state of efficiency in production of this crop for policy purposes.

Based on the above discussion, this study was intended to explore the following questions:

1. What is extent of attitude of farmers towards maize cultivation?
2. What are the relationships among the farmers selected characteristics with the farmers' attitude towards maize cultivation?
3. What are the problems faced by the farmers and suggestions offered by them in maize cultivation?

1.4 Specific Objectives of the Study

1. To determine the attitude of farmers towards maize cultivation.
2. To explore the relationship between selected characteristics of the farmers with their attitude towards maize cultivation.
3. To know the problems faced by the farmer in maize cultivation and their probable suggestions to overcome those problems.

1.5 Assumptions of the Study

The researcher made the following assumptions while undertaking the study.

1. The researcher who has acted as interviewer was well adjusted to the social and cultural environment of the study area. Hence, the data collected by the researcher from the respondents furnished their correct opinions.
2. The respondents were capable of furnishing proper responses to the questions included in the interview schedule.
3. Views and opinions given by the respondents included in the sample of the study were the representative views and opinions of the whole population of the study area.

4. The responses furnished by the respondents were reliable and valid. They expressed the truth about their convictions and awareness.
5. The information sought reveals the real situation to satisfy the objectives of the study.
6. The items, questions and scales included in the questionnaire were relevant and appropriate.
7. Data were normally and independently distributed.
8. The sampling procedures followed for this study, the analysis of data and interpretations etc. were free from all biases.

1.6 Limitations of the Study

In order to make the study manageable and meaningful from the point of view of research, it was necessary to state the limitations of this study, which are given as follows:

1. The study was confined to Chehelgazi union of Sadar upazilla under Dinajpur districts.
2. The characteristics of the respondents in the study area were many and varied. However, only nine characteristics were selected for investigation in this study as stated in the objectives.
3. The researcher relied on the data furnished by the farmers from their memory during interview.
4. For some cases, the researcher faced unexpected interference from the over interested side-talkers while collecting data from the target population. However, the researcher tried to overcome the problem as far as possible with sufficient tact and skill.

1.7 Definition of Important Terms

For clarity of understanding a number of key terms used through the study are defined below:

Attitude: Attitude means one's feelings, beliefs and actions towards an object and concept. This variable was operationalizing by developing an attitude scale, following Likert method of summated ratings.

Technology: The combination of all the management practices used for producing and otherwise managing of a given crop, crop mixture, livestock and other farm activities.

Maize production technologies: Maize production technologies referred to the different kind of technologies which were used for maize cultivation. In this study, technology was defined as the combination of four practices (i.e. variety, intercropping, recommended dose of urea and use of Sheller) used for maize cultivation.

Modern Maize Cultivation: Modern maize cultivation referred as the cultivation of maize with the use of method or technique viz. sowing method, application of fertilizer, use of variety, etc.

Problem meant any difficult situation which required some actions to minimize the gap between “what ought to be” and “what is”. The term problem referred to different difficulties faced by the farmers in case of maize cultivation.

Problem faced: The term “Problem faced” refers to different problems faced by the farmers during maize cultivation.

CHAPTER 2

REVIEW OF LITERATURE

In this chapter, reviews of the related literature to the study are presented. The researcher intensively searched internet, websites, available books, journals and printed materials from different sources of home and abroad. It may be relevant here to mention that a good number of research activities concerning attitude of farmers towards maize cultivation in Dinajpur Sadar upazilla.

However, the literatures have been organized into following four sections to set the context of the study:

First section : Concept of Attitude

Second section : Reviews of Literature Relevant to the Attitude of Different Aspects

Third section : Review of Literature Related to Selected Characteristics of the Farmers with their Attitude

Fourth section : The Conceptual Framework of the Study

2.1 Concept of Attitude

Attitude is a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation. Attitude influences an individual's choice of action, and responses to challenges, incentives, and rewards (Business Dictionary, 2012).

The classic, tripartite view is that an attitude contains cognitive, affective, and behavioral components. Empirical research, however, fails to support clear distinctions between thoughts, emotions, and behavioral intentions associated with a particular attitude (Rosenberg and Hovland, 2012).

A criticism of the tripartite view of attitudes is that it requires cognitive, affective, and behavioral associations of an attitude to be consistent, but this may be implausible. Thus some views of attitude structure see the cognitive and behavioral components as derivative of affect or affect and behavior as derivative of underlying beliefs (Whitley, 2010).

The readiness to respond to a certain object in a favorable or unfavorable fashion; every attitude has both an intrinsic belief and a behavioral disposition. Attitudes are a permanent system of evaluations, emotions, and direct behavioral tendencies for or against an object. Individuals develop their attitudes through a continuous process of adaptation to the social environment. Attitudes are organized ways of thinking and acting in relation to facts and

people in our environment, and they help influence our overall way of life (Encyclopedia of Britannica, 1960).

Attitudes can also be explicit and implicit. Explicit attitudes are those that we are consciously aware of and that clearly influence our behaviors and beliefs. Implicit attitudes are unconscious, but still have an effect on our beliefs and behaviors (Cherry, 2012).

Attitude is the learned orientations towards object, or predisposition to behave in certain ways towards a given objects or a class of objects. An attitude has always on object, person, thing or concept and it may be general or specific (McGrath, 1966).

Attitude, in social psychology, is a predisposition to classify objects and events and to react to them with some degree of evaluative consistency. The concept of attitude arises from attempt to account for observed regularities in the behavior of individual persons. The quality of one's attitude is judged from the observable, evaluative responses he tends to make (Encyclopedia of Britannica, 1960).

An attitude as the degree of positive or negative affect associated with some psychological object like symbol, phrase, slogan, person, institution, ideal or ideas towards which people can differ in varying degrees (Thurstone, 1946).

Attitude as a state of mental and emotional readiness to react to situations, person or things, in harmony with a habitual pattern of response previously conditioned to or associated with these stimuli. Attitude is the by-product of an individual's experience and has their bases in inner uses, acquired habits and environmental influences by which he is surrounded (Goode, 1945).

2.1.1 Components of attitude

Triandis (1971) explained that, "An attitude is an idea charged with emotion, which predisposes a class or actions to a particular class or social situation." This definition suggests that attitude has three components, those components are cognition, affective and behavioral, are:

- a) The cognitive component of 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 of an attitude refers to the emotions connected with the object. The object is 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.

Krech *et al.* (1962) explains attitude as a system of the interrelated components that the authors express as “In defining attitude as systems, we are emphasizing the interrelatedness of the three attitude components. When incorporated in a system, these components become mutually interdependent about an object and are influenced by his feelings and action tendencies toward that object. And a change in his cognition about the object will tend to produce changes in his feelings and action tendencies toward it.”

2.1.2 Formation of attitude

Attitudes form directly as a result of experience. They may emerge due to direct personal experience, or they may result from observation. Social roles and social norms can have a strong influence on attitudes. Social roles relate to how people are expected to behave in a particular role or context. Social norms involve society's rules for what behaviors are considered appropriate.

Attitudes can be learned in a variety of ways. Consider how advertisers use classical conditioning to influence your attitude toward a particular product. In a television commercial, one sees young, beautiful people having fun in on a tropical beach while enjoying a sport drink. This attractive and appealing imagery causes you to develop a positive association with this particular beverage. Operant conditioning can also be used to influence how attitudes develop. Imagine a young man who has just started smoking.

Whenever he lights up a cigarette, people complain, chastise him and ask him to leave their vicinity. This negative feedback from those around him eventually causes him to develop an unfavorable opinion of smoking and he decides to give up the habit. Finally, people also learn attitudes by observing the people around them. When someone you admire greatly espouses a particular attitude, you are more likely to develop the same beliefs. For example, children spend a great deal of time observing the attitudes of their parents and usually begin to demonstrate similar outlooks (Cherry, 2012).

2.1.3 Changes of attitude

While attitudes can have a powerful effect on behavior, they are not set in stone. The same influences that lead to attitude formation can also create attitude change. The theories of attitude that can influence people's attitude are:

Learning theory of attitude change: Classical conditioning, operant conditioning and observational learning can be used to bring about attitude change. Classical conditioning can be used to create positive emotional reactions to an object, person or event by associating positive feelings with the target object. Operant conditioning can be used to strengthen desirable attitudes and weaken undesirable ones. People can also change their attitudes after observing the behavior of others.

Elaboration likelihood theory of attitude change: This theory of persuasion suggests that people can alter their attitudes in two ways. First, they can be motivated to listen and think about the message, thus leading to an attitude shift, or they might be influenced by characteristics of the speaker, leading to a temporary or surface shift in attitude. Messages that are thought-provoking and that appeal to logic are more likely to lead to permanent changes in attitudes.

Dissonance theory of attitude change: As mentioned earlier, people can also change their attitudes when they have conflicting beliefs about a topic. In order to reduce the tension created by these incompatible beliefs, people often shift their attitudes (Cherry, 2012).

2.2 Reviews of Literature Relevant to the Attitude of Different Aspects

Rahman (2015) found that about 77.78 percent of the respondents had high favorable attitude towards the rice cultivation and 22.22 percent of the respondents had low favorable attitude towards the rice cultivation.

Chawdhury (2015) observed that the major portion (56.7 percent) of the respondents had moderately favorable attitude compared to 28.9 percent having slightly favorable attitude and only 14.4 percent had highly favorable attitude towards pariza rice cultivation.

Hossain (2015) found that the highest proportion (70.9 percent) of the farmers had favorable, 17.3 percent had not favorable and 11.8 percent had highly favorable attitude towards aquaculture.

Rabby (2014) revealed that half (50.0 percent) of the respondents had favorable attitude towards jute cultivation compared to 48.2 percent respondents had negative attitude while only 1.8 percent had neutral attitude towards jute cultivation.

Rashid (2014) found that highest proportion (58.7 percent) of farmers had moderately favorable attitude, while 22.1 percent and 19.2 percent had highly favorable attitude and slightly favorable attitude towards the use of *dolochun* for crop production.

Husna (2014) revealed that two-thirds (66.2 percent) of the respondents had less favorable attitude followed by 21.3 percent had medium favorable and only 12.5 percent had high favorable attitude towards pesticide risk reduction.

Ahmed (2013) reported that maximum (60.0 percent) of the farmers had highly favorable attitude towards *thai koi* farming.

Khan (2012) found that the majority (64.0 percent) of the farmers had moderately favorable attitude, compared to 29 percent having favorable and only one percent had unfavorable attitude towards modern jujube cultivation.

Shahin (2012) revealed that, highest proportion (38.0 percent) of farmers had ‘moderately favorable’ while 32 percent and 30 percent had ‘highly favorable’ and ‘slightly favorable’ attitude towards the use of Cattle Health Card (CHC) under SDVC project of CARE respectively

Samad (2010) found that the majority (69.84 percent) of the farmers had favorable attitude, while one percent had unfavorable attitude and 29.16 percent had neutral attitude for the project farmers. The attitude score of non-project farmers showed that the majority (58.33 percent) possessed neutral attitude, 2.08 percent had favorable attitude and 39.59 percent had favorable attitude towards aerobic rice cultivation.

Ahmed (2006) found that majority (87.0 percent) of the shrimp farmers had favorable attitude towards shrimp farming compared to 7 percent having neutral and only 6 percent had unfavorable attitude.

Uddin *et al.*, (2006) observed equal proportion of farmers (39.0 percent) having moderately favorable and highly favorable attitude towards sustainable agriculture. On the other hand, 4 percent and, 18 percent farmers had highly unfavorable and moderately unfavorable attitude towards sustainable agriculture respectively.

2.3 Review of Literature Related to Selected Characteristics of the Farmers with their Attitude

2.3.1 Age and attitude

Rahman (2015) found that Age of the farmers had significant positive relationship with their attitude on BRR1 dhan47 cultivation.

Hossain (2015) found in his study that age of the fish farmers had positive significant relationship with their attitude towards practicing aquaculture.

Husna (2014) revealed that age of the mango growers had negative relationship with their attitude towards pesticide risk reduction.

Rashid (2014) found that age of the farmers showed negative significant relationship with their attitude towards *dolochun* using in land.

Ahmed (2013) observed that age of the respondents had positively significant relationship with their attitude towards thai koi farming.

Khan (2012) revealed that age of the jujube farmers had no significant relationship with their attitude towards modern jujube cultivation.

Shahin (2012) observed that age of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded that there was no significant relationship between age of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.*, (2007) found that there was negatively significant relationship between age of the farmers and their attitude towards organic farming.

Chowdhury *et al.*, (2006) reported in his study that age of the farmers had no significant relationship with their attitude towards sustainable agriculture.

2.3.2 Education and attitude

Rahman (2015) found that level of education farmers had significant positive relationship with their attitude on BRRI dhan47 cultivation.

Chawdhury (2015) found that education had no significant relationships with the farmers' attitude towards pariza rice cultivation.

Hossain (2015) reported in his study that education of the fish farmers had positive significant relationships with their attitude towards practicing aquaculture.

Husna (2014) reported that educational level of the mango growers had significant relationship with their attitude towards pesticide risk reduction.

Rashid (2014) found that educational level of the farmers showed significant relationship with their attitude towards using *dolochun* in land.

Ahmed (2013) observed that educational level of the respondents had positively significant relationship with their attitude towards thai koi farming.

Khan (2012) found that educational level of the jujube farmers had no significant relationship with their attitude towards modern jujube cultivation.

Shahin (2012) observed that educational level of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

2.3.3 Family size and attitude

Rahman (2015) found that family size of the farmers had no significant relationship with their attitude towards BRRI dhan47 cultivation.

Hossain (2015) found in his study that family size of the fish farmers had no significant relationships with their attitude towards practicing aquaculture.

Rashid (2014) observed that family size of the farmers showed negative significant relationship with their attitude towards using *dolochun* in land.

Shahin (2012) found that there was no significant relationship between family size of the farmers and their attitude towards SDVC project of CARE.

Parvez (2007) concluded in his study that there was no significant relationship between family size of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) observed that there was no relationship between family size of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that family size of the farmers had no significant relationship with their attitude towards sustainable agriculture.

2.3.4 Farm size and attitude

Rahman (2015) found that farm size of the farmers had no significant relationship with their attitude towards BRRI dhan47 cultivation.

Chawdhury (2015) found that farm size had no significant relationships with the farmers' attitude towards pariza rice cultivation.

Hossain (2015) concluded in his study that farm size of the fish farmers had positive significant relationships with their attitude towards practicing aquaculture.

Rabby (2014) observed in his study that farmers' farm size had positive significant relationship with their attitude towards towards jute cultivation.

Rashid (2014) concluded that farm size of the farmers showed non-significant relationship with their attitude towards using *dolochun* in land.

Husna (2014) found that farm size of the mango growers had non-significant relationship with their attitude towards pesticide risk reduction.

Ahmed (2013) observed that farm size of the respondents had no significant relationship with their attitude towards thai koi farming.

Khan (2012) reported that farm size of the jujube farmers had significant positive relationship with their attitude towards modern jujube cultivation.

Shahin (2012) observed that farm size of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

2.3.5 Annual income and attitude

Chawdhury (2015) found that annual income had no significant relationship with the farmers' attitude towards pariza rice cultivation.

Hossain (2015) concluded in his study that annual income of the fish farmers had positive significant relationships with their attitude towards practicing aquaculture.

Rabby (2014) found in his study that farmers' annual household income had positive significant relationship with their attitude towards jute cultivation.

Rashid (2014) concluded that annual family income of the farmers showed non-significant relationship with their attitude towards using *dolochun* in land.

Husna (2014) observed that annual income of the mango growers had non-significant relationship with their attitude towards pesticide risk reduction.

Ahmed (2013) observed that annual family income of the respondents had no significant relationship with their attitude towards thai koi farming.

Shahin (2012) found that annual family income of the respondents had significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded in his study that there was no significant relationship between annual income of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was no significant relationship between annual family income of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that annual family income of the farmers had no significant relationship with their attitude towards sustainable agriculture.

2.3.6 Training received and attitude

Rahman (2015) found that training exposure of the farmers had no significant relationship with their attitude towards BRR1 dhan47 cultivation.

Chawdhury (2015) found that training received had positive significant relationships with the farmers' attitude towards pariza rice cultivation.

Hossain (2015) reported in his study that training received of the fish farmers had positive significant relationships with their attitude towards practicing aquaculture.

Rabby (2014) found in his study that farmers' training received had positive significant relationship with their attitude towards towards jute cultivation.

Rashid (2014) revealed that training had positive significant relationship with their attitude towards using *dolochun* in land.

Ahmed (2013) observed that training exposure of the respondent had positive significant relationship with their attitude towards thai khoi farming

Bhuiyan (2008) found in his study that farmers' training experience had positive significant relationship with their attitude towards farmers' information need assessment.

Islam (2007) observed a significant positive relationship between training received by the farmers' and their attitude towards modern jute cultivation.

2.3.7 Cosmopolitanism and attitude

Chawdhury (2015) found that cosmopolitanism had positive significant relationships with the farmers' attitude towards pariza rice cultivation.

Samad (2010) revealed that cosmopolitanism had positive significant relationships with the farmers' attitude towards aerobic rice cultivation.

2.3.8 Extension media contact and attitude

Rahman (2015) found that extension contact of the farmers had significant positive relationship with their attitude on BRR1 dhan47 cultivation.

Chawdhury (2015) found that extension media had positive significant relationships with the farmers' attitude towards pariza rice cultivation.

Hossain (2015) observed in his study that extension media contact of the fish farmers had no significant relationships with their attitude towards practicing aquaculture.

Rabby (2014) found in his study that farmers' contact with extension media had positive significant relationship with their attitude towards towards jute cultivation.

Rashid (2014) revealed that extension media contact of the farmers showed significant relationship with their attitude towards using *dolochun* in land.

Azad (2007) found a significant relationship between extension media exposure and farmer's attitude towards medicinal plants.

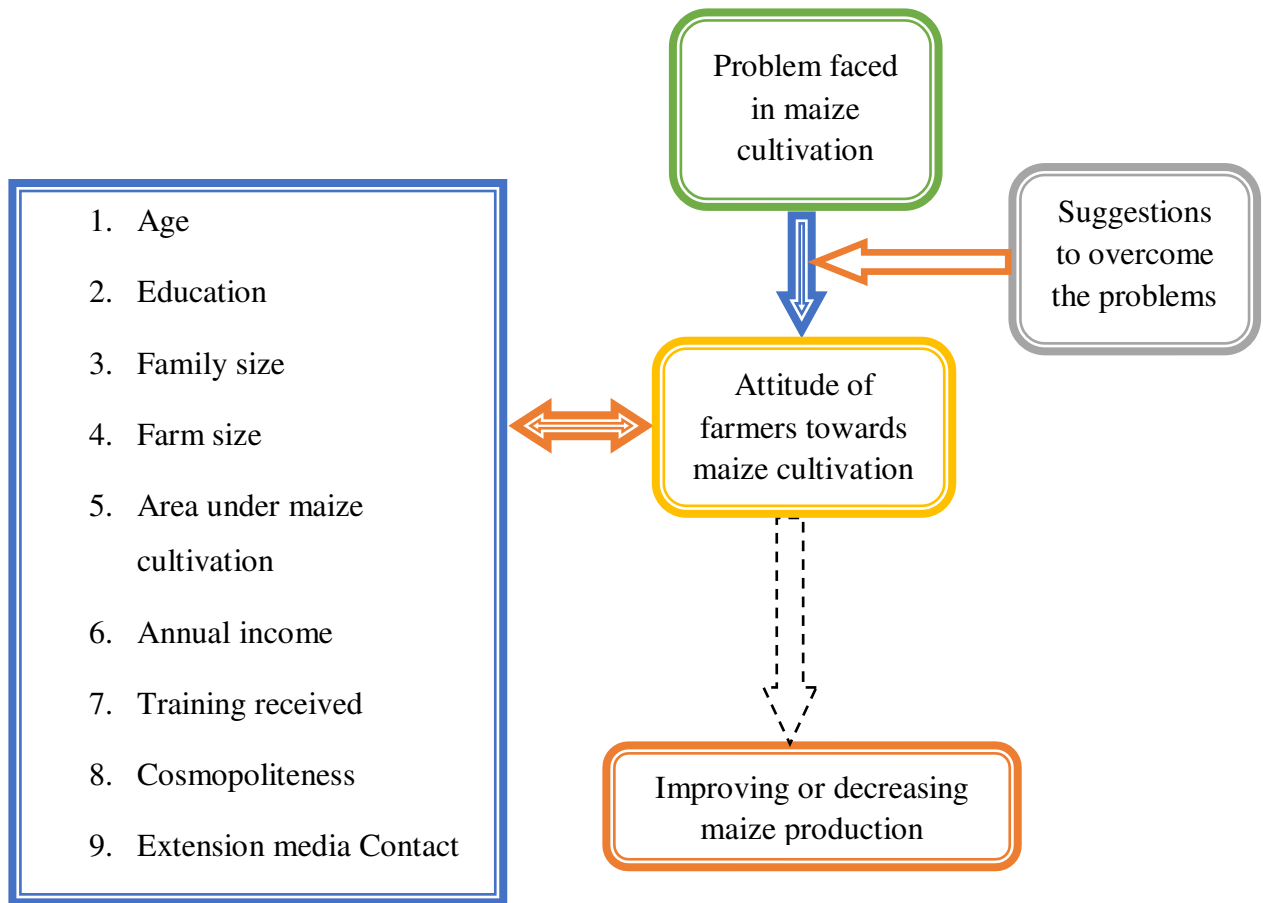
Hossain (2006) observed a significant relationship between extension media exposure and farmer's attitude towards plantation of timber yielding plants.

2.4 Conceptual Framework of the Study

In order to develop the conceptual framework for the selected characteristics and focus issue of this study, attitude is conceptualized having three components as; i) cognitive domain come from head ii) affective domain come from heart and iii) behavior components come from different visible parts of the body such as hand, skin, ear, eye, etc. From the past studies and literature, it is observed that various factors influenced and affected farmers in acquiring their attitude towards innovation. In this study, the researcher mainly attempted to highlight two concepts, namely farmers' selected characteristics (age, education, family size, farm size, area under maize cultivation, annual income, training received, cosmopolitaness, and extension media contact) and attitude towards maize cultivation. Problem faced by the farmers in maize cultivation and suggestion given by farmers to overcome the problems also identified.

An individual's attitude may be influenced by his/her personal characteristics and through other interacting forces in his/her surroundings. As it is quite impossible to deal with all the forces and characteristics in a single study, it is, therefore, needed to be confined with some selected characteristics.

Farmers' characteristics may also influence on problem confrontation and vice-versa which is not investigated in this research work. On the basis of above discussion and review of literature, the conceptual framework of this study has been structured as shown in Figure 2.1.




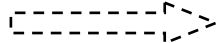
 Indicates parameters under investigation
 Indicates parameters not considered for investigation

Figure 2.1 Conceptual framework of the study

CHAPTER 3

METHODOLOGY

In any scientific research, methodology deserves a very careful consideration. Methodology 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 being described below.

3.1 Locale of the Study

The present study was conducted in Chehelgazi union of Sadar upazila under Dinajpur district. There are 13 upazilas in Dinajpur district. Among these, Sadar upazila is one of the agriculturally important upazilla where rice, wheat, maize, vegetables are intensively cultivated. Most of the farmers of this area are directly and/or indirectly engaged in agricultural activities and few people are service holders and businessmen. The geographical location of the study area is at 25⁰30' to 25⁰45' north latitudes and 88⁰30' to 88⁰45' east longitudes. This upazila is bounded by Khansama and Kaharole upazila of Dinajpur district in the north, West Bengal of India in the south, Chirirbandar upazila in the east and Biral upazila in the west. A map of Dinajpur district including its upazilas and Sadar upazila showing the study area is given in Figure 3.1 and Figure 3.2 respectively.

3.2 Population and Sample

Dinajpur Sadar upazilla of Dinajpur district was purposively selected due to investigator's familiarity of the area, language and culture of the people. There are ten unions in Sadar upazilla among which Chehelgazi union was selected by random sampling procedure. Chehelgazi union consists of 29 villages. From 29 villages 6 villages were selected by random sampling procedure. The farmers of these villages involved in maize cultivation. An up-to-date list of 920 maize farmers from six villages was collected from upazilla agriculture office of Sadar upazilla under Dinajpur district. Out of them a sample of 92 farmers (10 percent) was selected by random sampling method. Simultaneously a reserve list of 9 farmers was made in order to use in case of non-availability of sampled farmers. The detailed distribution of population and sample are shown in Table 3.1.

Table 3.1 Village wise distribution of the population and sample

Name of the village	Population	Sample	Reserve list
Kornai	130	13	1
Katapara	180	18	2
Hajipara	150	15	1
Ekbarpur	185	19	2
Mostofabud	125	12	1
Noshipur	150	15	2
Total=	920	92	9

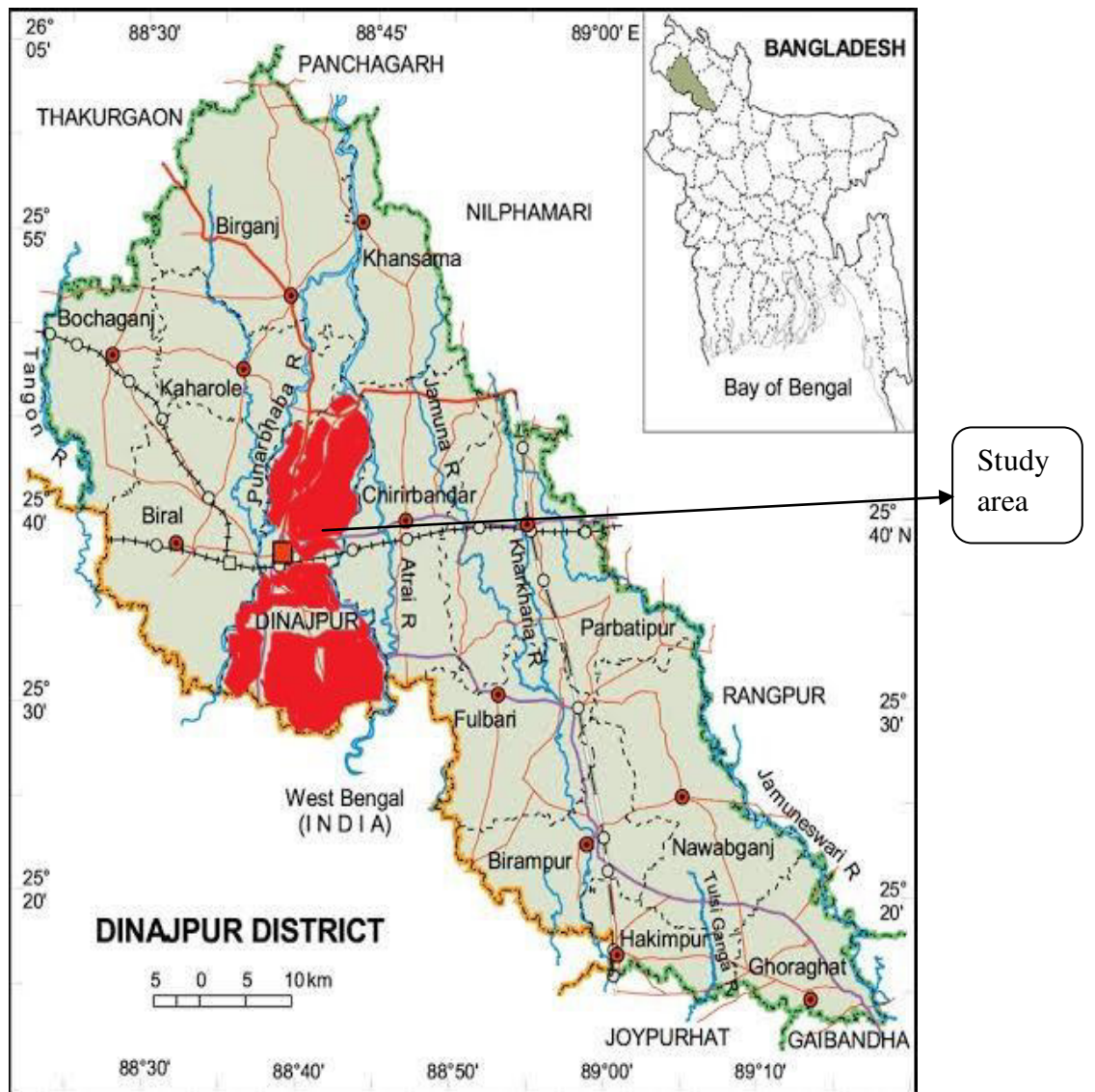


Figure 3.1 Map of Dinajpur district including its upazilla (Bangladesh inset)

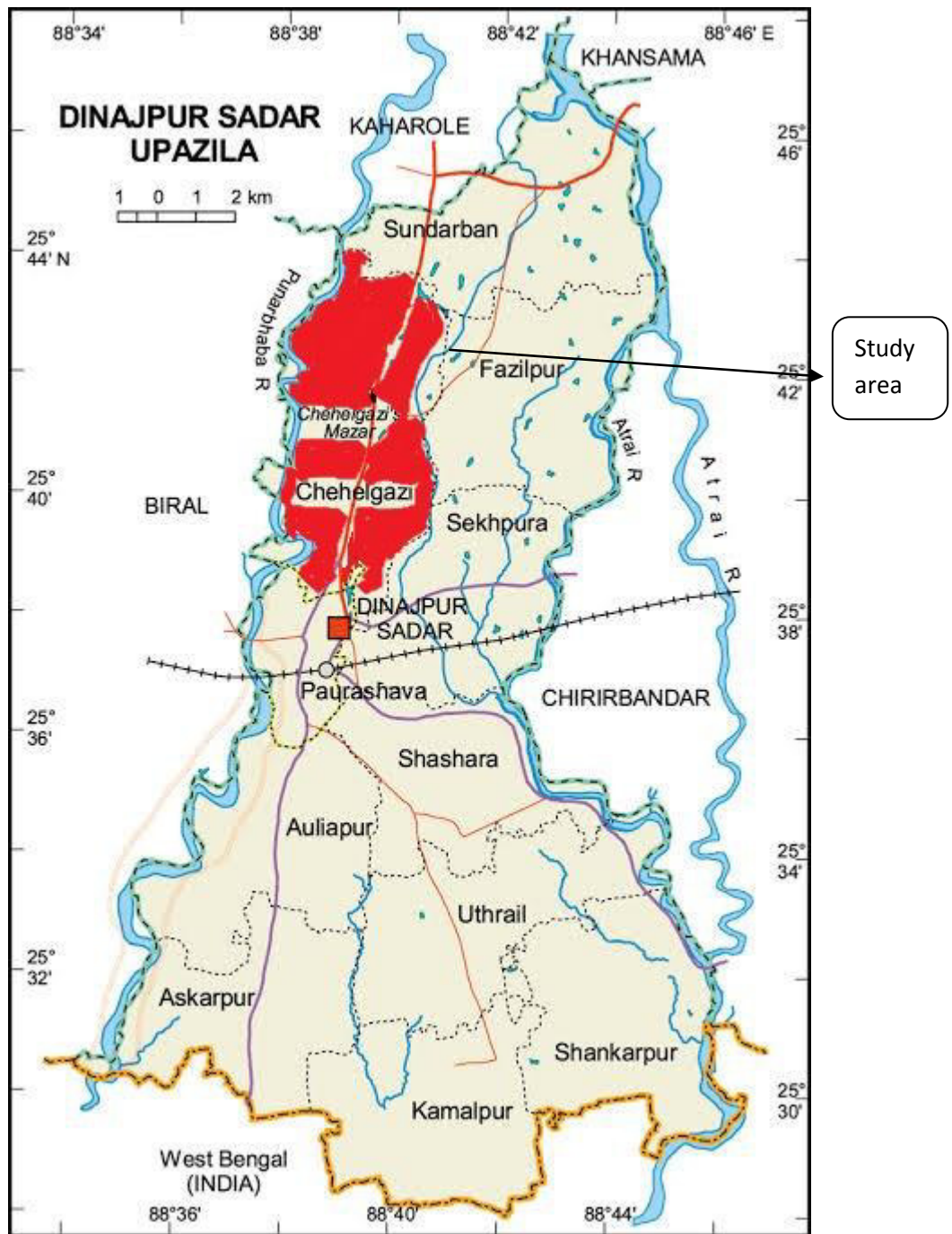


Figure 3.2 Map of Dinajpur Sadar upazilla showing the study area

3.3 Research Instrument

In order to collect relevant data for the study, a structured interview schedule was prepared keeping the objectives in mind. The questions and statements contained in the schedule were simple, direct and easily understandable by the respondents. The schedule contained closed form of questions. A draft interview schedule was prepared in advance before using the same for collection of data. The draft schedule was pre-tested with 10 respondents selected from the study area. This pre-test facilitated the researcher to identify faulty questions in the draft schedule and necessary corrections, addition and adjustment was made afterwards in the schedule on the basis of the pre-test results.

3.4 Measurement of Focus Issue

Attitude of farmers towards maize cultivation was the focus issue. This focus issue was measured by Likert scale, a scale mentioned by Likert (1932).

Ten statements on various aspects of maize cultivation were asked to the respondents. The number of positive statements was 5 and that of negative statements was also 5. The positive and negative items were arranged randomly in the schedule in order to facilitate the respondents' real attitude to be revealed. The respondents were asked to indicate for each of the statement whether they strongly agree, agree, undecided, disagree and strongly disagree with a corresponding score of 5, 4, 3, 2 and 1 for the positive items and vice-versa for the negative items.

The score of a respondent's attitude towards positive and negative statements of maize cultivation were computed by summing his responses to all the items. Hence, scores of the respondents could range from 10 to 50; 10 indicating highly unfavorable attitude and 50 highly favorable attitudes towards maize cultivation. Beside this, Rank Order (RO) was done by calculating Attitude Index (AI). The following formula would be followed to calculate AI:

$$\text{Attitude Index (AI) for positive statements} = F_{SA} \times 5 + F_A \times 4 + F_U \times 3 + F_D \times 2 + F_{SD} \times 1$$

Where,

F_{SA} = Frequency of respondents mentioned 'strongly agreed'

F_A = Frequency of respondents mentioned 'agreed'

F_U = Frequency of respondents mentioned 'undecided'

F_D = Frequency of respondents mentioned 'disagreed'

F_{SD} = Frequency of respondents mentioned 'strongly disagreed'

Attitude Index (AI) for negative statements = $F_{SA} \times 1 + F_A \times 2 + F_U \times 3 + F_D \times 4 + F_{SD} \times 5$

Where,

F_{SA} = Frequency of respondents mentioned strongly agree

F_A = Frequency of respondents mentioned agree

F_U = Frequency of respondents mentioned undecided

F_D = Frequency of respondents mentioned disagree

F_{SD} = Frequency of respondents mentioned strongly disagree

Where, the Attitude Index (AI) value could range from 92 to 460. This means that 92 initially less favorable and 460 indicated high attitude.

3.5 Measurement of Selected Characteristics of the Farmers

The nine characteristics of the respondents namely age, education, family size, farm size, area under maize cultivation, annual income, training received, cosmopolitaness, and extension media contact constituted the selected characteristics of this study. The measurement procedure of these selected characteristics discussed below.

3.5.1 Age

Age of the respondent was measured in terms of years from his/her birthday to the time of interview which will be found on the basis of response. A unit score was assigned for each year of one's age. The characteristic appears in the item No. 1 in the interview schedule (Appendix-A).

3.5.2 Education

Education was measured as the ability of an individual farmer to read and write or formal education received up to a certain standard. Education of the respondents was measured in terms of one's year of schooling. One score was given for passing each level in an educational institution (Mondol, 2009). For example, if a respondent passed the final examination of class V his/her education score was taken as five (5). If a respondent did not know how to read and write, his education score was given as '0'. A score of 0.5 was given to that respondent who could sign his/her name only. The characteristic appears in the item No. 2 in the interview schedule (Appendix-A).

3.5.3 Family size

Family size was measured by the total number of members in the family of a respondent. The family members included the respondent himself, his wife, children and other dependent members who lived and ate together. A unit score was assigned for each member of the

family. If a respondent had five members in his/her family, then family size score was given as 5 (Khan, 2004). The characteristic appears in the item No. 3 in the interview schedule (Appendix A).

3.5.4 Farm size

Farm size was measured by the area of the raised land in which the household of the respondent had its entire dwelling unit including homestead area under cultivation (Sarker, 2004). It was expressed in hectare. The total areas of land thus obtained have been considered as farm size of the respondent. The characteristic appears in the item No. 4 in the interview schedule (Appendix A). It was measured using the following formula:

$$\text{Farm size} = a + b + \frac{1}{2}(c + d) + e + f + g$$

Where,

a= Homestead (including garden and fallow land)

b= Own land under own cultivation

c= Land given to others on barga (share cropping system)

d= Land taken from others on barga (share cropping system)

e= Land taken from others on lease

f= Pond area

g=Others (if any)

3.5.5 Area under maize cultivation

The farm size under maize cultivation was measured by the area of the land in which maize cultivation were practiced. It was expressed in hectare. The total areas of land thus obtained have been considered as area under maize cultivation of the respondent. The characteristic appears in the item No. 5 in the interview schedule (Appendix A).

It was measured using the following formula:

$$\text{Area under maize cultivation} = 1 + (2+3)/2 + 4$$

Where, 1= Own land

2= Land taken from others on barga

3= Land given to others on barga

4= Land taken from others on lease

3.5.6 Annual income

Annual income of a respondent was measured on the basis of total yearly earning by the respondent himself and other family members. The value of all the sources encompassing crops (rice, wheat, maize), vegetables, fruits, dairy and poultry, fish culture, service, business, and day labour etc. were taken into consideration. For calculation of income score, one (1) was assigned for each one thousand taka of income. The characteristic appears in the item No. 6 in the interview schedule (Appendix A).

3.5.7 Training received

Training received was determined by the total number of days of training received by the farmers from any organization during the last three years. If a respondent took three days training on agriculture from GOs, NGOs or any other organization, then his training exposure score was 3 and so on. The characteristic appears in the item No. 7 in the interview schedule (Appendix A).

3.5.8 Cosmopolitaness

Cosmopolitaness referred to the degree to which an individual is oriented to his social system. Cosmopolitaness of respondent was measured by computing a cosmopolitaness score based on frequency of eight different places external to his social system. Each respondent was asked to indicate the number of visits to the eight different types of place. Score assigned to one's responses was 0, 1, 2, and 3 for 'not at all', 'rarely', 'occasionally' and 'regularly', respectively. The scores obtained for visiting the above six place was added together to get the cosmopolitaness score of a respondent and ranged from 0 to 18. The characteristic appears in the item No. 8 in the interview schedule (Appendix A)

3.5.9 Extension media contact

The contact with extension media score was computed for each respondent on the basis of extent of contact with 10 selected extension media among which four of them belong to individual media, three of them under group media and three of them under mass media contact category. For measuring the contact with extension score was assigned for the extension media 3, 2, 1 and 0 for the extent of contact 'regularly', 'often' 'rarely, and 'not at all', respectively. The characteristic appears in the item No. 9 in the interview schedule (Appendix A). Extension media contact score was determined by summing the scores of all the 10-communication media. Contact with extension score could range from 0 to 30, where 0 indicated no extension media contact and 30 indicated the regular extension media contact.

3.6 Measurements of Problems and Suggestion in Maize Cultivation

The farmers were requested to mention the problems on maize cultivation problems and were also requested to mention the means to solve these problems. In this case an open-ended question was used. Then the mentioned problems and suggestions were ranked on the basis of number of citations on the respective areas.

3.7 Hypothesis of the Study

3.7.1 Research hypothesis

Based on review of literature and development of conceptual framework, the following research hypothesis was formulated: ‘There were significant relationships between the selected nine characteristics (i.e. age, education, family size, farm size, area under maize cultivation, annual income, training received, cosmopolitaness, and extension media contact) of the farmers and their attitude toward maize cultivation. However, when a researcher tries to perform statistical tests, then it becomes necessary to formulate null hypothesis.

3.7.2 Null hypothesis

Null hypothesis: ‘There was no significant relationship between the selected nine characteristics (i.e. age, education, family size, farm size, area under maize cultivation, annual income, training received, cosmopolitaness, and extension media contact) of farmers and their attitude toward maize cultivation.

3.8 Collection of Data

Data were collected personally by the researcher himself through face to face interview. To familiarize with the study area and for getting local support, the researcher took help from the local leaders and the field staffs of Upazila Agriculture Office. The researcher made all possible efforts to explain the purpose of the study to the farmers. Rapport was established with the farmers prior to interview and the objectives were clearly explained by using local language as far as possible. Data were collected during the period of 15 September to 15 October 2017.

3.9 Data Processing

After completion of field survey, all the data were coded, compiled and tabulated according to the objectives of the study. Local units were converted into standard units. All the individual responses to questions of the interview schedule were transferred in to a 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.

3.10 Statistical Analysis

The Statistical Package for Social Science (SPSS) 20.0 computer program was used for analyzing the data. Various descriptive statistical measures such as frequency, number, percentage, mean, standard deviation and rank order was used for categorization and describing the variables. Pearson's Product Moment Correlation Coefficient (r) was used for testing the relationships between the concerned variables. At least 5.0 percent ($P=0.05$) level of probability was used as a basis for rejection of the null-hypotheses throughout the study.

CHAPTER 4

RESULTS AND DISCUSSION

The findings of the study and interpretations of the results have been presented in this chapter. These are presented in four sub-sections according to the objectives of the study. The first sub-section deals with attitude of farmers towards maize cultivation, while the second sub-section deals with the selected characteristics of the farmers. In third section deals with the relationship between the selected characteristics of the farmers and their attitude towards maize cultivation and fourth sub-section deals with the problems and suggestion.

4.1. Attitude of Farmers toward Maize Cultivation

Attitude of farmers towards maize cultivation scores ranged from 20 to 46 whereas the expected ranged 10 to 50. The mean of the farmer's attitude being 37.91 with a standard deviation of 5.73. Based on the observed attitude scores, the farmers were classified into three categories as: "slightly favorable" (≤ 30), "moderately favorable" and (31-40), "highly favorable" (>40). The Distribution of the farmers according to their attitude towards maize cultivation has been shown in Table 4.1.

Table 4.1 Overall distributions of the farmers according to their attitude towards maize cultivation

Categories of attitude (Score)	Respondents (N=92)		Mean	SD
	Number	Percent		
Slightly favorable (≤ 30)	0.00	0.00	37.91	5.73
Moderately favorable (31-40)	24	26.1		
Highly favorable (>40)	68	73.9		

Data presented in Table 4.1 indicated that about three-fourths (73.9 percent) of the farmers had highly favorable attitude towards maize cultivation while 26.1 percent moderately favorable attitude and there is no farmers under slightly favorable attitude towards maize cultivation.

It is found that the majority whole (100 percent) of the farmers showed moderately favorable to highly favorable attitude towards maize cultivation. Rank order and attitude indices of the attitude of farmers towards maize cultivation shown in Table 4.2. The weights assigned for the responses were same for all the statements. The positive score ranged from 460 to 92 for positive responses and for negative responses vice-versa.

Table 4.2 Rank order of attitude indices towards maize cultivation

Sl. No.	Statements	Frequency of the Respondents					AI	RO
		SA	A	U	D	SD		
1.(+)	Production and price of maize is high so, cultivation of maize is profitable rather than other crops cultivation.	56	33	0	1	2	416	1.5 th
2.(-)	At present inputs for maize are high costs, So maize cultivation is not profitable.	22	22	6	35	7	259	5 th
3.(+)	As yield of maize is high and food security is a crucial issue, therefore maize cultivation can play a very important role in present day for food security.	27	48	5	10	2	364	4 th
4.(-)	So far I know maize is C ₄ plant that is why they uptake more nutrients, so, high input is required for maize cultivation.	7	29	9	36	11	291	10 th
5.(+)	As maize is cultivated like other field crops, so it has no adverse effect on environment.	19	45	9	14	5	335	9 th
6.(-)	The nutrient uptake rate of maize from soil is high therefore if proper organic matter is not provided then soil quality is adversely affected.	4	15	7	40	26	345	7 th
7. (+)	Unemployment problems can be solved in the local community through maize cultivation.	36	35	9	10	2	369	3 rd
8. (-)	More inter-cultural operation is required for maize cultivation so it's laborious than other crop cultivation.	2	22	5	33	30	343	8 th
9.(+)	As maize cultivation increase the income of the farmers from per unit of land, so it helps to improve the economic status of the farmers	61	24	3	2	2	416	1.5 th
10.(-)	Transpiration rate in maize plant is very high, therefore it requires more irrigation. Fulfillment of high irrigation demand discourages farmers to cultivate maize.	4	13	11	34	30	349	6 th

SA=Strongly Agree; A= Agree; U= Undecided; D= Disagree and SD= Strongly Disagree;
AI= Attitude Index and RO= Rank Order

Data contained in Table 4.2 revealed that the statements “Production and price of maize is high so, cultivation of maize is profitable rather than other crops cultivation” and “As maize cultivation increase the income of the farmers from per unit of land, so it helps to improve the economic status of the farmers” are the jointly first two ranked statement in the attitude index table having AI value of 416. This is due to that maize yield is high and profit also high. Therefore ultimately improves their socio-economic status.

“Unemployment problems can be solved in the local community through maize cultivation” had AI value of 369 and ranked 3. Data contained in Table 4.2 revealed that the statement “So far I know maize is C₄ plant that is why they uptake more nutrients, so, high input is required for maize cultivation”, “As maize is cultivated like other field crops, so it has no adverse effect on environment”, and “More intercultural operation is required for maize cultivation so it’s laborious than other crop cultivation” are the last three ranked statement in the attitude index table having AI value of 291(10th), 335 (9th) and 343(8th), respectively.

4.2 Selected Characteristics of the Farmers

Nine characteristics of the farmers were selected to find out their relationships with their attitude towards maize cultivation. The selected characteristics included their age, education, family size, farm size, area under maize cultivation, annual income, training received, cosmopolitaness, and extension media contact. These characteristics of the farmers are described in this section.

Data contained in the Table 4.3 reveal the main features of the characteristics of the farmers in order to have an overall picture of these characteristics at a glance. However, for ready reference, separate tables are provided while presenting categorizations, discussing and /or interpreting results concerning each of the characteristics in this chapter.

4.2.1 Age

The observed age of the farmers ranged from 19-68 years with a mean of 43.77 year and standard deviation of 13.14. On the basis of their age, they were classified into three categories as young (≤ 35), middle aged (36-50) and old (≥ 51) (Table 4.3).

Less than half (40.2 percent) of the farmers were middle aged compared to 30.4 percent of them being young aged and 29.4 percent old. Slightly less than three-fourths (70.6 percent) of the farmers were young to middle aged. Young people are generally interested to new ideas and things. They have a favorable attitude towards trying new ideas or technologies.

Table 4.3 Main features and categorization of the farmers (N=92)

Characteristics	Scoring method	Range		Categories	Respondents		Mean	SD
		Possible	Observed		No.	Percent		
Age	No. of year	Unknown	19-68	Young (≤ 35)	28	30.4	43.77	13.14
				Middle aged (36-50)	37	40.2		
				Old (≥ 51)	27	29.4		
Education	Year of schooling	Unknown	0-16	Illiterate (0)	17	18.5	6.43	5.52
				Can sign only (0.5)	17	18.5		
				Primary level (1-5)	8	8.7		
				Secondary level (6-10)	27	29.3		
				Higher secondary level (11-12)	11	12.0		
				Above higher secondary (≥ 13)	12	13.0		
Family size	No. of members	Unknown	3-9	Small (1-4)	28	30.4	5.15	1.37
				Medium (5-7)	60	65.2		
				Large (>7)	4	4.4		
Farm size	Hectare	Unknown	0.14-4.11	Marginal (<0.21)	3	3.3	1.08	0.84
				Small (0.21-1.0)	57	62.0		
				Medium (1.01-3.0)	27	29.3		
				Large (>3.0)	5	5.4		
Area under maize cultivation	Hectare	Unknown	0.06-2.02	Marginal (0.06-0.33)	51	55.4	0.36	0.27
				Small (0.34-0.61)	32	34.8		
				Medium (>0.61)	9	9.8		
Annual income	('000' Tk.)	Unknown	67.10-1024.00	Low (≤ 99)	6	6.5	257.12	158.44
				Medium (99.01-415)	72	78.3		
				High (>415)	14	15.2		
Training received	Days	Unknown	0-180	No (0)	58	63.0	7.29	32.14
				Short (≤ 3)	20	21.7		
				Medium (4-7)	9	9.8		
				Long (>7)	5	5.5		
Cosmopolitaness	Score	0-18	3-16	Low (≤ 6)	43	46.7	6.73	2.58
				Medium (7-12)	45	48.9		
				High (>12)	4	4.4		
Extension media Contact	Score	0-30	2-24	Low (≤ 10)	60	65.2	9.86	5.21
				Medium (11-20)	26	28.3		
				High (≥ 21)	6	6.5		

4.2.2 Education

The education scores of the farmers ranged from 0.00 to 16, the mean being 6.43 and standard deviation 5.52. Based on education scores the respondents were classified into four categories such as illiterate (0), can sign only (0.5), primary level (1-5), secondary level (6-10), higher secondary level (11-12), and above higher secondary (≥ 13) as presented in Table 4.3.

The distribution of the farmers according to their education is shown in Table 4.3. The highest proportion (29.3 percent) of the farmer's secondary level, 18.5 percent illiterate, 18.5 percent can sign only, 13.0 percent above higher secondary level, 12.0 percent higher secondary level and only 8.7 percent of them primary level educated. Thus, the overwhelming majority (56.5 percent) of the farmers had education ranging from can sign only to secondary level. Education helps individuals to become rational, conscious and to get useful information to solve their daily working problems through different sources of information. It might help to improve their knowledge on maize cultivation.

4.2.3 Family size

The family size of the farmers ranged from 3 to 9 having mean value of 5.15 and standard deviation 1.37. On the basis of their family size, they were classified into three categories as small (1-4), medium (5-7) and large (>7) family size. (Table 4.3).

Data presented in Table 4.3 indicated that slightly above three-fifths of the farmers 65.2 percent had medium sized family. On the other hand, 30.4 percent had small family and only 4.4 percent had large family. Thus, the overwhelming majority (95.6 percent) of the farmers had small to medium sized family. The national average family size in Bangladesh is 4.3 (BBS, 2017) which was near the mean value of the present study (5.15). It is quite logical that prevalence of joint family system in the study area might have also contributed to the large family size.

4.2.4 Farm size

The most important production factor of farming is the land which is a scarce resource in Bangladesh. The farm size is the main indicator of holding farming status by the farmers. The farm size scores of the farmers ranged from 0.14 to 4.11, the average being 1.08 and standard deviation 0.84. The farmers were classified into four categories as 'marginal' (<0.21) 'small' (0.21-1.0), 'medium' (1.01-3.0) and 'large' (>3.0) as shown in Table 4.3.

The data furnished in the Table 4.3 revealed that slightly above three-fifths (62.0 percent) of the respondents were small farm sized, 29.3 percent had medium farm size, 5.4 percent had large farm size and only 3.3 percent had marginal farm size. Farm size of the people is being decreased day by day due to land fragmentation through generation to generation. In order to have a reasonable standard of living these farmers must be able to have high yield of crops per hectare and increase their cultivation intensity.

4.2.5 Area under maize cultivation

The area under maize cultivation of the farmers ranged from 0.06 to 2.02 hectares and the mean was 0.36 hectares with standard deviation of 0.27. According to the area under maize cultivation of the farmers, they were classified into three categories as marginal (0.06-0.33), Small (0.34-0.61) and medium (>0.61). The distribution of the farmers according to their area under maize cultivation is shown in Table 4.3.

Data showed that above half (55.4 percent) of the farmers were under marginal category followed by 34.8 percent under small and 9.8 percent under medium category. Thus, the overwhelming majority (90.2 percent) of the farmers had marginal to small maize cultivating area.

4.2.6 Annual income

Annual income of the farmers ranged from 67.10 to 1024.00, the mean being 257.12 and standard deviation 158.44. On the basis of their family income scores, the farmers were divided into three categories: low (≤ 99) medium (99.01-415) and high (>415). The distribution of the farmers according to their family income is shown in Table 4.3.

The majority (78.3 percent) of the farmers had medium income compared to 15.2 percent of them having high income and only 6.5 percent had low income. Thus, the huge majority (93.5 percent) of the farmers had medium to high income.

4.2.7 Training received

The observed training received scores of the farmers ranged from 0 to 180 with an average of 7.29 days and a standard deviation of 32.14. On the basis of their observed training received scores, the farmers were classified into four categories: no (0), short (≤ 3), medium (4-7) and long (>7). The distribution of the farmers according to their training received is shown in Table 4.3.

Data contained in Table 4.3 showed that slightly above three-fifths (63.0 percent) of the farmers had no training received compared to 21.7, 9.8 and 5.5 percent having short, medium

and long training received respectively. Thus most of the farmers had low level of exposure to agricultural training. It also proved that there is always a relationship between training received and change attitude towards modern technologies. Because training received develops the farmers' knowledge, skill and attitude in positive manner. The findings suggest that training experience might be the most important factor for the respondents to change their attitude towards modern maize cultivation.

4.2.8 Cosmopolitaness

The cosmopolitaness score of the farmers ranged from 3 to 16 with a mean of 6.73 and standard deviation of 2.58. Based on the cosmopolitan scores, the farmers were classified into three categories as low (≤ 6), medium (7-12) and high (> 12). The distribution of the farmers according to their cosmopolitaness score is presented in Table 4.3.

Data showed that near about half proportion (48.9 percent) of the farmers had medium cosmopolitaness while 46.7 percent had low cosmopolitaness and only 4.4 percent had high cosmopolitaness. People differ in their traveling behavior. Despite the innate characteristics of traveling behavior, actually most of the people now a day, in the rural community are very much concerned about their basic needs and they extensively visit to other place time to time as because in most of the cases there is good communication network. The communication system in most of the cases in Bangladesh is developing day by day. So, the farmers of the country have an opportunity to visit place to place.

4.2.9 Extension media contact

Extension media contact refers to an individual's contact with different extension communication media for receiving modern agricultural information. The extension media contact scores of the farmers ranged from 2 to 24, against the possible score 0 to 30. The mean and standard deviation were 9.86 and 5.21 respectively. The respondents were classified into three categories based on their extension media contact as low (≤ 10), medium (11-20) and high (≥ 21) as shown in Table 4.3.

Data presented in Table 4.3 shows that majority (65.2 percent) of the farmers had low extension media contact, 28.3 percent had medium extension media contact and only 6.5 percent had high extension media contact. The findings indicate that the overwhelming majority (93.5 percent) of the farmers had low to medium extension media contact. This may be due to the reason that the respondents contact not more strongly with different extension media.

4.3 Relationship between the Selected Characteristics of the farmers with Their Attitude towards Maize Cultivation

The purpose of this section is to explore the relationships between each of the selected characteristics of the farmers and their attitude towards maize cultivation. The selected characteristics constituted independent variables and the focus issue was considered attitude of farmers towards maize cultivation. Pearson's Product Moment Correlation Co-efficient 'r' was used to test the null hypothesis concerning the relationship between any two variables. The summary results of test of correlation coefficient are shown in Table 4.4. However, a correlation matrix for focus issue and selected characteristics were presented in Appendix B.

4.3.1 Age and attitude of farmers towards maize cultivation

According to the computed 'r' (0.017) value as shown in Table 4.4 reveals that the relationship between age and attitude of farmers towards maize cultivation was not significant. Hence, the concerned null hypothesis could not be rejected. Similar findings were also observed by Ahmed (2013) and Khan (2012).

Table 4.4 Correlation between focus issue and selected characteristics

Focus Issue	Selected Characteristics	Correlation Value of 'r' with 90 df
Attitude of farmers towards maize cultivation	Age	0.017
	Education	0.233*
	Family size	-0.067
	Farm size	0.206*
	Area under maize cultivation	0.110
	Annual income	0.183
	Training received	0.107
	Cosmopolitaness	0.211*
	Extension media contact	0.214*

**, Correlation is significant at the 0.01 level and *, Correlation is significant at the 0.05 level

4.3.2 Education and attitude of farmers towards maize cultivation

According to the computed 'r' (0.233) value as shown in Table 4.4 reveals that the relationship between education and attitude of farmers towards maize cultivation was statistically significant with 90 degrees of freedom at 0.05 level of significance. Hence, the concerned null hypothesis could be rejected. Similar findings were also observed by Rahman (2015), Hossain (2015), Husna (2014) and Rashid (2014).

4.3.3 Family size and attitude of farmers towards maize cultivation

According to the computed 'r' (-0.067) value as shown in Table 4.4 reveals that the relationship between family size and attitude of farmers towards maize cultivation was not

significant. Hence, the concerned null hypothesis could not be rejected. Similar findings were also observed by Rahman (2015), Hossain (2015) and Shahin (2012).

4.3.4 Farm size and attitude of farmers towards maize cultivation

According to the computed 'r' (0.206) value as shown in Table 4.4 reveals that the relationship between farm size and attitude of farmers towards maize cultivation was statistically significant with 90 degrees of freedom at 0.05 level of significance. Hence, the concerned null hypothesis could be rejected. So, with the increasing of the farm size attitude of the farmers increased. Similar findings were also observed by Hossain (2015), Rabby (2014) and Khan (2012).

4.3.5 Area under maize cultivation and attitude of farmers towards maize cultivation

According to the computed 'r' (0.110) value as shown in Table 4.4 reveals that the relationship between area under maize cultivation and attitude of farmers towards maize cultivation was not significant. Hence, the concerned null hypothesis could not be rejected.

4.3.6 Annual income and attitude of farmers towards maize cultivation

According to the computed 'r' (0.183) value as shown in Table 4.4 reveals that the relationship between annual income and attitude of farmers towards maize cultivation was not significant. Hence, the concerned null hypothesis could not be rejected. Similar findings were also observed by Chawdhury (2015), Rashid (2014), Husna (2014) and Ahmed (2013).

4.3.7 Training received and attitude of farmers towards maize cultivation

According to the computed 'r' (0.107) value as shown in Table 4.4 reveals that the relationship between training received and attitude of farmers towards maize cultivation was not significant. Hence, the concerned null hypothesis could not be rejected. Similar findings were also observed by Rahman (2015).

4.3.8 Cosmopolitaness and attitude of farmers towards maize cultivation

According to the computed 'r' (0.211) value as shown in Table 4.4 reveals that the relationship between cosmopolitaness and attitude of farmers towards maize cultivation was statistically significant with 90 degrees of freedom at 0.05 level of significance. Hence, the concerned null hypothesis could be rejected. So, with the increasing of the cosmopolitaness attitude of the farmers increased. Similar findings were also observed by Chawdhury (2015) and Samad (2010).

4.3.9 Extension media contact and attitude of farmers towards maize cultivation

According to the computed 'r' (0.214) value as shown in Table 4.4 reveals that the relationship between extension media contact and attitude of farmers towards maize cultivation was statistically significant with 90 degrees of freedom at 0.05 level of significance. Hence, the concerned null hypothesis could be rejected. So, with the increasing of the extension media contact attitude of the farmers increased. Similar findings were also observed by Rahman (2015), Chawdhury (2015), Rabby (2014) and Rashid (2014).

4.4 Problems and Suggestions

Farmers may face several problems that hinder maize cultivation. For easy understanding of the problems faced by the farmers and the suggestions to overcome the problems given by them are listed in this section with their number of citation, percent and rank order.

4.4.1 Problems faced by the farmers in maize cultivation

The researcher made an attempt to identify the various problems in maize cultivation which are presented below (Table 4.5).

Table 4.5 Rank order of problems faced by the farmers in maize cultivation

Problems	No. of citation	Percent	Rank order
Production cost of maize cultivation is higher than other crops	72	78.26	1 st
Maize is highly infested by insects and diseases	53	63.04	2 nd
Lack of training on maize cultivation	47	57.61	3 rd
Natural calamities hampered the maize cultivation	44	47.83	4 th
Maize cultivation is difficult due to high amount of intercultural operations	40	43.49	5 th
The cultivation technique is more laborious	38	41.30	6 th
Poor extension service	28	30.43	7 th
Lack of knowledge on hybrid maize variety	23	25	8 th

It is evident from the data contained in the Table 4.5 that 'Production cost of maize cultivation is high than other crops' (78.26 percent) emerged as the most important problem expressed by the farmers. The result may be due to the maize cultivation is needed more input and intercultural operation. 'Maize is highly infested by insects and diseases' (63.04 percent) was the second most problem perceived by the farmers. It is due to that they have low level of knowledge on preventive measures form these insect and disease.

The last two perceived problem mentioned by the farmer was ‘Lack of knowledge on hybrid maize variety’ (25 percent) and “Poor extension service” (30.43 percent). This might be due to that the extension service is very poor in study area. They have fewer sources for collection of information about maize cultivation.

4.4.2 Suggestions offered by the farmers to overcome the problems

Many suggestions were offered by the farmers to overcome the problems in maize cultivation. These are given in Table 4.6.

Table 4.6 Rank order of suggestions offered by the farmers to overcome the problems in maize cultivation

Suggestions	No. of citation	Percent	Rank order
Organizing more training program for the farmers	52	56.52	1
Natural calamities tolerant variety cultivation	49	53.26	2
Use hybrid maize variety	43	46.74	3
Improve extension service	35	30.03	4
Organizing training program specially on hybrid maize variety	31	33.69	6
Cost of input material should be kept in a level of farmers purchasing	27	29.35	7
Soil should be disinfected by lime application	32	34.78	5
Application of IPM technique	26	28.26	8

It is noted from the data in Table 4.6 that the foremost (56.52 percent) suggestion cited by the farmers was ‘organizing more training program for the farmers’. This implies that more will be the training more will be information collected by the farmers. Training programmes are more helpful in enhancing farm knowledge to them.

‘Natural calamities tolerant variety cultivation’ was the second most important (53.26 percent) suggestion offered by the farmers. This is due to that more the farmers affected by different Natural calamities such as drought, flood, and storm etc. ‘Application of IPM technique’ (28.26 percent) was suggested by the farmers as the last suggestion. The result might be due to that the IPM is environment friendly technique for pest and insects management. The 2nd last suggestion was “Cost of input material should be kept in a level of farmers purchasing” (29.35 percent). This is due to that most of the farmers are not economically solvent.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

The study was undertaken to determine the attitude of farmers towards maize cultivation, to explore the relationship between selected characteristics of the farmers with their attitude towards maize cultivation and to determine the problems faced by the farmers in maize cultivation and their probable suggestions to overcome those problems. The study was carried out in Chehelgazi unions of Sadar upazilla under Dinajpur district. Ninety two (92) farmers were selected as sample from an updated list of 920 farmers' involved in maize cultivation. Data were collected by a pre-tested interview schedule during 15 September to 15 October 2017. This chapter presents the summary of the major findings, conclusion and recommendations of the study.

5.1.1 Attitude of farmers toward maize cultivation

Attitude of farmers towards maize cultivation scores ranged from 20 to 46 and slightly near three-fourths (73.9 percent) of the farmers had highly favorable attitude towards maize cultivation while 26.1 percent moderately favorable attitude and none had slightly favorable attitude towards maize cultivation. It is found that all (100.0 percent) of the farmers showed moderately favorable to highly favorable attitude towards maize cultivation.

Rank order and attitude indices of the attitude of farmers towards maize cultivation positive score ranged from 460 to 92 for positive responses and for negative responses vice-versa. "Production and price of maize is high so, cultivation of maize is profitable rather than other crops cultivation" and "As maize cultivation increase the income of the farmers from per unit of land, so it helps to improve the economic status of the farmers" are the jointly first two ranked statement in the attitude index table having AI value of 416. "So far I know maize is C₄ plant that is why they uptake more nutrients, so, high input is required for maize cultivation", "As maize is cultivated like other field crops, so it has no adverse effect on environment", and "More intercropping operation is required for maize cultivation so it's laborious than other crop cultivation" are the last three ranked statement in the attitude index table having AI value of 291(10th), 335 (9th) and 343(8th), respectively.

5.1.2 Selected characteristics of the farmers

The observed **age** of the farmers ranged from 19-68 years and less than half (40.2 percent) of the farmers were middle aged compared to 30.4 percent of them being young aged and 29.4 percent old. Slightly less than three-fourths (70.6 percent) of the farmers were young to middle aged. The **education** scores of the farmers ranged from 0.00 to 16 and the highest proportion (29.3 percent) of the farmer's secondary level, 18.5 percent illiterate, 18.5 percent can sign only, 13.0 percent above higher secondary level, 12.0 percent higher secondary level and only 8.7 percent of them primary level educated. Thus, the overwhelming majority (56.5 percent) of the farmers had education ranging from can sign only to secondary level. The **family size** of the farmers ranged from 3 to 9 and three-fifths of the farmers 65.2 percent had medium sized family. On the other hand, 30.4 percent had small family and only 4.4 percent had large family. Thus, the overwhelming majority (95.6 percent) of the farmers had small to medium sized family.

The **farm size** scores of the farmers ranged from 0.14 to 4.11 and slightly above three-fifths (62.0 percent) of the respondents were small farm sized, 29.3 percent had medium farm size, 5.4 percent had large farm size and only 3.3 percent had marginal farm size. The area under maize cultivation of the farmers ranged from 0.06 to 2.02 and above half (55.4 percent) of the farmers were under marginal maize area category followed by 34.8 percent under small and 9.8 percent under medium maize area category. Thus, the overwhelming majority (90.2 percent) of the farmers had marginal to small maize area. **Annual income** of the farmers ranged from 67.10 to 1024.00 and the majority (78.3 percent) of the farmers had medium income compared to 15.2 percent of them having high income and only 6.5 percent had low income. Thus, the huge majority (93.5 percent) of the farmers had medium to high income.

The observed **training** received scores of the farmers ranged from 0 to 180 and slightly above three-fifths (63.0 percent) of the farmers had no training received compared to 21.7, 9.8 and 5.5 percent having short, medium and long training received respectively. The **cosmopolitaness** score of the farmers ranged from 3 to 16 and near about half portion (48.9percent) of the farmers had medium cosmopolitaness while 46.7percent had low cosmopolitaness and only 4.4percent had high cosmopolitaness. The **extension media contact** scores of the farmers ranged from 2 to 24 and majority (65.2 percent) of the farmers had low extension media contact, 28.3 percent had medium extension media contact and only 6.5 percent had high extension media contact. The findings indicate that the overwhelming majority (93.5 percent) of the farmers had low to medium extension media contact.

5.1.3 Relationship between the selected characteristics of the farmers with their attitude towards maize cultivation

Correlation analyses indicated that among nine selected characteristics education, farm size, cosmopolitanism and extension media contact of the farmers had positive significant relationships with their attitude towards maize cultivation. However, age, family size and area under maize cultivation, annual income and training received had no significant relationships with their attitude towards maize cultivation.

5.1.4 Problems and suggestions

The farmers mentioned 8 problems and also 8 suggestions to overcome those problems. Among them two important problems were i) Production cost of maize cultivation is high than other crops (78.26 percent), and ii) Maize is highly infested by insects and diseases (63.04 percent).

Among the suggestions to overcome the problems two important suggestions were i) Organizing more training program for the farmers (56.52 percent), and ii) Natural calamities tolerant variety cultivation (53.26 percent).

5.2 Conclusions

Based on the above findings the following conclusions were drawn:

1. Slightly near three-fourths (73.9 percent) of the farmers had highly favorable attitude towards maize cultivation. It may be concluded that the cultivation of maize will not be possible to improve to a significant extent unless the concerned authorities (relevant GOs and NGOs) take proper steps to improve farmers' attitude towards maize cultivation.
2. The overwhelming majority (56.5 percent) of the farmers had education ranging from can sign only to secondary level. It may be concluded that education of the study area would give positive attitude towards the innovative agricultural technologies and also help extension providers to demonstrate, disseminate, train and motivate farmers to adopt appropriate technologies.
3. Among nine selected characteristics education, farm size, cosmopolitanism and extension media contact of the farmers had positive significant relationships with their attitude towards maize cultivation. . It may, therefore be concluded that the above characteristics of the farmers significantly contribute to increase maize cultivation.

4. Age, family size and area under maize cultivation, annual income and training received had no significant relationships with their attitude towards maize cultivation. This indicates that attitude maize cultivation, and above characteristics of the farmers are independent to each other.
5. The maize farmers are facing different problems in cultivating maize. They also opined some suggestions to overcome them. Therefore, it can be concluded that important problems have to taken under consideration and should take proper initiatives in this regards.

5.3 Recommendations

5.3.1 Recommendations for policy implication

1. Slightly near about three-fourths of the farmers had highly favorable attitude towards maize cultivation. So, the concerned GOs and NGOs have still scope here to work in this regards for increasing maize cultivation.
2. Age had no significant relationship with attitude of the farmers towards maize cultivation. Therefore, it may be recommended that DAE and NGOs should target young and middle aged beneficiaries to change their attitude towards maize cultivation.
3. The farmers' literacy rate was high and it related to their knowledge gain. It is therefore, recommended that farmers can take advantage of different printed materials i.e. book, booklets, leaflets, posters, newspapers, etc. so that they can get more knowledge easily and can increase positive attitude. It is, therefore, recommended that arrangement should be made by the concerned authorities to undertake more educational activities for increasing the education level of the farmers.
4. Extension contact was positive in relation to knowledge. It is thus, strongly recommended that a media campaign should be launched involving all teaching methods in a balanced way to increase the positive attitude towards hybrid maize cultivation.
5. For increasing farmers' knowledge concern authority should take necessary motivational program like training and motivational program on maize cultivation so that the farmers could increase their maize cultivation.

6. Farmers faced considerable amount of problems on maize cultivation. It is therefore, recommended that concerned authorities should take attention to the solution of the problems as soon as possible.

5.3.2 Recommendations for further study

1. The study was conducted among the farmers of selected area of Chehelgazi unions of Sadar upazilla under Dinajpur district. Findings of this study need verification by similar research in other parts of the country.
2. Attitude towards maize cultivation production was investigated. But such study may be conducted by taking into consideration of other factors.
3. Relationships of nine characteristics of the farmers with their attitude were investigated in this study. Further research should be conducted to explore relationships of other characteristics of the farmers with their attitude maize cultivation.
4. It is difficult to determine the appropriate attitude of the farmers towards maize cultivation. Measurement of attitude of the farmers is not free from questions. More reliable measurement of the concerned variables is necessary for evaluating farmers' attitudes and opinions.
5. Larger farm size compared to national average suggests further studies may be conducted with larger samples than the sample taken at present study.

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Appendix A
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An Interview Schedule for a Research Study on the
Attitude of Farmers towards Maize Cultivation in Dinajpur Sadar Upazilla

Date: -----

Serial No.

Name of Respondent ----- Father's Name -----

Village: ----- Union: -----

(Please answer the following questions)

1. Age

What is your present age?Years

2. Education: Mention of your educational qualification.

- a) Do not read and write
- b) Can sign name only
- c)class passed

3. Family size: Mention of your family members including you.

a) Male =

b) Female=

Total=

4. Farm size: Indicate the area of land in your possession.

Sl. No.	Nature of holding	Area		
		Local Unit		Hectare
		Bigha	Decimal	
a.	Homestead (including garden and fallow land)			
b.	Own land under own cultivation			
c.	Land given to others on barga (share cropping system)			
d.	Land taken from others on barga (share cropping system)			
e.	Land taken from others on lease			
f.	Pond area			
g.	Others (if any)			
Total $[a+ b+\frac{1}{2} (c+d)+ e+ f+ g]=$				

5. Area under maize cultivation: Please furnish information about your area under maize cultivation.

Sl. No.	Pattern of ownership of farm land	Farm land area	
		Local unit	Standard unit (ha.)
1.	Own land		
2.	Land taken from others on barga		
3.	Land given to others on barga		
4.	Land taken from others on lease		
Total [1+ (2+3)/2+ 4]=			

6. Annual income: Give particulars about your family income of last year from different sources.

Sl. No	Source of income	Production	Market price	Total (TK.)
1.	Crops (Rice, Wheat, Maize)			
2.	Vegetables			
3.	Fruits			
4.	Dairy and Poultry			
5.	Fish culture			
6.	Service			
7.	Business			
8.	Day labour			
9.	Others (if any)			
Total =				

7. Training received: Have you received any training during the last three years?

Yes

No

If yes, please furnish the following information

Sl. No.	Name of Organization(s)	Duration (Days)
1.		
2.		
3.		
4.		

8. Cosmopolitaness: State your extent of visit of the following places.

Sl. No.	Places of visit	Extent of visit (times)			
		Not at all	Rarely	Occasionally	Regularly
1.	Visit friends /relatives houses		1-2 times/month	3-4 times/month	>5times/month
2.	Visit union parisad office		1-2 times/month	3-4 times/month	>5times/month

3.	Visit own upazila porisad		1-2 times/season	3 times/season	>5times/season
4.	Visit own district town		1-2 times/season	3 times/season	>5times/season
5.	Visit other district town		1-2 times/year	3-4 times/year	>5times/year
6.	Visit division or capital city		1-2 times/year	3-4 times/year	>5times/year

9. Extension media contact: Indicate the extent of your contact with following extension media in last year.

Name of extension media		Frequency of contact			
		Regularly	Often	Rarely	Not at all
Individual contact	Neighbors and friends	5-6 times/ year	3-4 times/ year	1-2 times/ year	
	Sub Assistant Agriculture Officer	5-6 times/ months	3-4 times/months	1-2 times/ months	
	Agricultural Extension Officer	Do	Do	Do	
	NGO personnel	5-6 times/ weeks	3-4 times/ weeks	1-2 times/ weeks	
Group contact	Result demonstration	2-3 times/ year	2 times/ year	1 times/ year	
	Group discussion	5-6 times/ months	3-4 times/ months	1-2 times/ months	
	Farmer's field day	1 times/ year	1 times/ 2 year	1 times/ 3 year	
Mass media contact	Listening radio program	5-7 times/ weeks	3-4 times/ weeks	1-2 times/ weeks	
	Watching TV program	Do	Do	Do	
	Reading agricultural article from daily newspaper	Do	Do	Do	

10. Attitude of farmers towards maize cultivation

Please indicate your opinion in respect of the following statements.

Sl. No.	Statements	Extent of opinion				
		SA	A	U	D	SD
1. (+)	Production and price of maize is high so, cultivation of maize is profitable rather than other crops cultivation.					
2. (-)	At present inputs for maize are high costs, So maize cultivation is not profitable.					
3. (+)	As yield of maize is high and food security is a crucial issue, therefore maize cultivation can play a very important role in present day for food security.					
4. (-)	So far I know maize is C ₄ plant that is why they uptake more nutrients, so, high input is required for maize cultivation.					
5. (+)	As maize is cultivated like other field crops, so it has no adverse effect on environment.					
6. (-)	The nutrient uptake rate of maize from soil is high therefore if proper organic matter is not provided then soil quality is adversely affected.					
7. (+)	Unemployment problems can be solved in the local community through maize cultivation.					
8. (-)	More intercultural operation is required for maize cultivation so it's laborious than other crop cultivation.					
9. (+)	As maize cultivation increase the income of the farmers from per unit of land, so it helps to improve the economic status of the farmers					
10. (-)	Transpiration rate in maize plant is very high, therefore it requires more irrigation. Fulfillment of high irrigation demand discourages farmers to cultivate maize.					

SA= Strongly agree, A=Agree, U= Undecided, D=Disagree and SD=Strongly Disagree

11. Problems in maize cultivation

Please mention some problems you faced in maize cultivation

1	
2	
3	
4	
5	
6	

12. Suggestions

Please mention some suggestions to overcome the above mentioned problems you faced in maize cultivation

1	
2	
3	
4	
5	
6	

Thank you for your cooperation.

(Signature of the interviewer)

Appendix-B

Correlation Matrix between Focus Issue and Selected Characteristics of the Farmers

	age	Education	Family size	Farm size	Area under maize cultivation	Annual income	Training received	Cosmopolitaness	Extension media contact	Attitude of farmers towards maize cultivation
Age	1									
Education	-0.203	1								
Family size	-0.070	-0.041	1							
Farm size	0.081	0.472**	0.127	1						
Area under maize cultivation	-0.191	0.233*	0.184	0.416**	1					
Annual income	-0.153	0.357**	0.216*	0.598**	0.625**	1				
Training received	0.078	0.313**	-0.080	0.645**	0.025	0.279**	1			
Cosmopolitaness	0.007	0.289**	0.111	0.266*	0.308**	0.198	0.145	1		
Extension media contact	-0.037	0.210*	0.290**	0.179	0.306**	.283**	.080	0.395**	1	
Attitude of farmers towards maize cultivation	0.017	0.233*	-0.067	0.206*	0.110	0.183	0.107	0.211*	0.214*	1

*. Correlation is significant at the 0.05 level; **. Correlation is significant at the 0.01 level