

PROBLEMS FACED BY THE FARMERS IN MAIZE CULTIVATION

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PROBLEMS FACED BY THE FARMERS IN MAIZE CULTIVATION

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CERTIFICATE

This is to certify that the thesis entitled **“PROBLEMS FACED BY THE FARMERS IN MAIZE CULTIVATION”** submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **Master of Science in Agricultural Extension**, embodies the result of a piece of *bona fide* research work carried out by **S M Golam Mortuza**, Registration No. 06-01871 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

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DEDICATED
TO
MY BELOVED PARENTS

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ACRONYMS AND ABBREVIATIONS

BAU	Bangladesh Agricultural University
BARI	Bangladesh Agricultural Research Institute
BBS	Bangladesh Bureau of Statistics
DAE	Department of Agricultural Extension
et al.	All others
etc.	et cetera, and the other
FAO	Food and Agriculture Organization
SAAO	Sub-Assistant Agriculture Officer
SAU	Sher-E-Bangla Agricultural University
SO	Scientific Officer
SPSS	Statistical Package for Social Science

PROBLEMS FACED BY THE FARMERS IN MAIZE CULTIVATION

ABSTRACT

The purpose of this study was to determine the problems faced by the farmers in maize cultivation and explore the relationship of the selected characteristics of the maize growers with their problems faced in maize cultivation. The selected characteristics were age, level of education, family size, farm size, and annual family income, maize cultivation area, training exposure on maize cultivation, extension media contact, cosmopolitans and knowledge on maize cultivation. Data were gathered from 82 maize growers of four villages of Nabagram Union of Manikganj Sadar Upazilla under Manikganj district by using a pretested interview schedule during the period from 15th January to 13th February, 2015. For harmonious representation from each village, 10 percent of the maize growers were selected as the sample by using stratified random sampling method. Pearson's Product Moment Co-efficient of Correlation was used to examine the relationship of the selected characteristics of the maize growers with their problems faced in maize cultivation. The findings revealed that more than two third (67.10 percent) of the respondents faced medium problem in maize production activities and 19.50 percent faced low problems and 13.40 percent faced high problems. Hence, findings again reveal that most (80.50 percent) of the farmers faced medium to high problems in maize production. Correlation analysis indicated that among the ten selected independent variables maize cultivation area, training exposure on maize cultivation, extension media contact, cosmopolitenes and knowledge on maize cultivation had significant and negative relationship with their problems faced while age, level of education, family size, farm size, and annual family income had no significant relationship with their problems faced in maize cultivation. Farmers faced higher problems in 'Lower market price of maize' followed by 'Lack of quality seeds' and 'Lack of training on maize cultivation'.

CHAPTER 1

INTRODUCTION

1.1 General Background

Maize or corn (*Zea mays*) is belonging to the family of grasses (Poaceae). It is cultivated globally being one of the most important cereal crops worldwide. Maize is not only an important human nutrient, but also a basic element of animal feed and raw material for manufacture of many industrial products. The products include corn starch, maltodextrins, corn oil, corn syrup and products of fermentation and distillation industries. It is also being recently used as bio-fuel. So the importance of export and import of maize is an important issue of the world trade. The United States, China, Brazil and Mexico account for 70% of global production. The use of maize varies in different countries. In USA, EU, Canada and other developed countries, maize is used mainly to feed animal directly or sold to feed industry and as raw material for extractive/fermentation industries. In developing countries use of maize is variable. In Latin America and Africa the main use of maize is for food while in Asia it is used for food and animal feed. In fact in many countries it is the basic staple food and an important ingredient in the diets of people. Globally, it has been estimated that approximately 21% of the total grain produced is consumed as food (Shaw, 1988; Dowsell et. al., 1996). Maize is the third most important cereal crop in Bangladesh, after rice and wheat. In Bangladesh it is mainly used for poultry feed, livestock's feed and human food in the form of various edible items. The production of maize in Bangladesh is popularizing for its multifarious use for food, feed and edible oil preparation (Ahad, 2003). The

cultivation of maize is increasing day by day due to its diversified use, where the total area coverage and productions were 3.17 lakh acres with a production of 7.29 lakh metric tons in 2008-2009 and 3.75 lakh acres with a production of 8.87 lakh metric tons in 2009-2010 (BBS, 2011). The maize is richer in nutrition than rice and wheat, where it contains 11% protein including higher amount of essential amino acid, tryptophan and lysine. Besides these, because of yellow color, it contains 90 mg carotene or Vitamin A in each 100g grains (Hossain *et al.*, 2005). Therefore, maize would grow further to meet future nutrition, feed, and other demands, especially in view of the booming livestock and poultry producing sectors in the country. There is an ample of opportunities for rapid expansion of maize area and production in Bangladesh through the dissemination of appropriate technologies and commercialization of current market systems.

Maize is cultivated in almost all the districts of Bangladesh except in Narail District (Anon, 2013). Much like in the case for seeds, the gap in the maize market is filled by imports. Thus price prevails at import parity where world corn price dominates in the domestic market as well. Bangladesh usually imports from regional and neighboring countries, like India and Myanmar who have surplus maize production.

Bangladesh is an agro-based country, although her food production is not increasing sufficiently to keep pace with the annual population growth rate. In this respect, maize can offer a partial solution to the chronic food shortage if its present yield level and total production can be raised by bringing more area under cultivation or by increasing yield per unit area. Maize has a high yielding potentiality with a wider range of climatic adaptability.

The agro-climatic conditions of Bangladesh are favourable for maize cultivation. Pest and disease infestations are low in this crop. Its water requirement is less compared to rice and wheat. It has also a great scope for diversified use. So, there is ample scope for expansion of maize areas in Bangladesh (Islam and Kaul, 1986). Farmers of Bangladesh were not experienced in commercial cultivation of maize. But now-a-days they have been influenced by a number of GOs and NGOs to adopt modern maize cultivation technologies. Maize can and will play an important role along with other cereals in meeting future need of growing population. Besides, maize has other additional benefits as follows:

- Low production cost especially for less irrigation/rain fed condition,
- High farm return,
- Increase employment opportunity in rural areas,
- Scope for strengthening flour and biscuit industry,
- Supply poultry feed and industrial raw materials,
- Higher yield or increased production for increased population.

The importance of maize cultivation in the economy of Bangladesh can hardly be over emphasized, but the production of maize has not been able to keep pace with the increased demand due to some problems regarding seed, production, processing, marketing, storage etc. Hence it is necessary to conduct a research study on the problems faced by the farmers in maize cultivation. Therefore, the purpose of the study was to have an understanding of the problems faced by the maize growers of selected area. It was anticipated that such study would discover the causes of the constraints related to cultivation, marketing, processing and storing of maize as well as help in cultivating an effective measure for maize cultivation all over the country.

1.2 Statement of the Problem

Maize production is increasing in Bangladesh day by day. A dynamic change in maize production has already been observed in Bangladesh in the 1990s. In order to have an understanding of the farmers' problems in maize cultivation, the researcher undertook the investigation entitled "Problems faced by the farmers in maize cultivation". In spite of greater potentially of maize cultivation the farmers of Bangladesh are not free from problems in the field of cultivating maize. They faced several problems in production and marketing. Most of the farmers in Bangladesh fail to overcome their problems. The farmers are compelled to sell major part of their produce immediately after harvesting at a very low price, mainly because of not even temporary storage accommodation being available to them. Therefore, research information is required which could be helpful to the policy makers, concerned bodies with the supply of inputs, technologies and knowledge's.

Problems in cultivation of maize influenced by their personal, economic, social characteristics. The researcher needs to an essential understanding of the maize cultivation problems faced by the farmers and its relationship with their various characteristics for effective planning and execution of increasing maize cultivation in Bangladesh. In this connection, the following research questions were raised to have clear understanding about the nature of problem faced by the maize farmers for solution:

- a) To what extent the farmers faced problems in maize cultivation?
- b) What are the selected characteristics of maize farmers?

- c) What relationship exists between the problems faced by the maize farmers and their selected characteristics?
- d) What are the problems faced by the farmers in maize cultivation?

1.3 Justification of the Study

The importance of maize in the farming systems has been recognized by the previous generation. The academicians, planners and administrators in extension service need to know the existing cognitive and affective levels of the client systems including the problems when the later groups have been facing. Needless to say that, research is necessary to determine the pattern of problems faced in maize production in order to formulate long-term strategy on maize production. Although some studies have been made, these were limited in scope and coverage. On a broader perspective, the investigator believes that the findings of the study will reveal the phenomenon related to high maize production. This will be of special interest to the policy makers and planners in formulating and redesigning the extension services especially for maize cultivation. The findings, in general, are expected to be helpful to the field workers of different nation building departments and organizations to improve strategies of extension for effectively working with the rural people.

1.4 Specific Objective of the Study

To lead the research in proper direction the following specific objectives have been set forth:

1. To determine and describe some selected characteristics of maize farmers. The selected characteristics are:
 - i. Age
 - ii. Level of education
 - iii. Family size
 - iv. Farm size
 - v. Annual family income
 - vi. Maize cultivation area
 - vii. Training exposure on maize cultivation
 - viii. Extension media contact
 - ix. Cosmopolitaness
 - x. Knowledge on maize cultivation
2. To determine the extent of problems faced by the farmers in maize cultivation
3. To explore the relationship between the problems faced by the farmers in maize cultivation and their selected characteristics
4. To compare the severity of the problems faced by the maize farmers

1.5 Scope and Limitations of the Study

The study was undertaken with a view to having an understanding of the problems faced by the farmers in maize cultivation. In order to conduct the research in a meaningful and manageable way it becomes necessary to impose some limitations with in regard to certain dimensions of the study. Considering the limitation of time, money and other resources available to the researcher, the following

limitations have been observed throughout the study.

1. The study was confined to Manikganj Sadar upazilla in Manikganj district.
2. Population for the present study was kept confined within the heads of farm families in the study area.
3. There were various dimensions in maize cultivation and many sorts of problems connected with this issue. It was not possible for the researcher to include all aspects of maize cultivation problems in a single study. In this study only 17 selected problems were faced by the farmers in maize cultivation.
4. There were many characteristics of the farmers in the study area but only 10 of them were selected for investigation.
5. For information about the study, the researcher depended on the data furnished by the selected respondents during their interview with him.
6. Facts and figures collected by the researcher applied to the situation prevailing during the year 2015.
7. Reluctance of the farmers to provide information was overcome by establishing rapport.

1.6 Assumption of the Study

An assumption is the supposition that an apparent or principle is true in the light of the available evidence (Goode and Hatt, 1952). The researcher had the following assumptions in mind while undertaking this study:

1. The respondents included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.

2. The responses furnished by the respondents were reliable. They express the truth while passing their opinions and providing information.
3. The views and opinions furnished by the maize growers included in the sample were the representative views and opinions of all the maize growers of the study area.
4. The researcher who acted as interviewer was well adjusted to the social and cultural environment of the study area. Hence, the respondents furnished their correct opinions without hesitation.
5. Data were normally and independently distributed with their means and standard deviation.
6. The findings of the study will have general applications to other parts of the country with similar personal, socio-economic and cultural conditions.

1.7 Definition of Terms

A researcher needs to know the meaning and contents of every term that he uses. A concept is an abstract of observed thing; events or phenomenon. It should clarify the issue as well as explain the fact to the investigator and readers. However, for clarity of understanding, a number of key concepts/terms frequently used throughout the study are defined and interpreted as follows:

Respondents: Randomly selected people considered to be representable of the population are known as respondents. They were the people from whom a social research worker usually got most data required for his research. In this study the respondents were the village level maize farmers.

Farmers: The persons who were involved in farming activities were called farmers. They participated in different farm and community level activities like crops, livestock, fisheries, other farming activities etc. In this study, maize growers were treated as farmers.

Age: Age of a respondent was defined as the span of life and was operationally measured by the number of years from his/her birth to the time of interviewing.

Level of education: Empirically it was defined to the development of desirable changes in knowledge, skill and attitudes in an individual through reading, writing, working, observation and other selected activities. It was measured on the basis of classes a farmer has passed from a formal educational institution.

Family size: Family size referred to the number including the respondent himself, his wife, children and other permanent dependents, who lived and lived together in a family unit.

Farm size: Farm size meant the total area of land on which a farmer's family carried on farming operations in terms of full benefit to the family.

Maize cultivation area: Maize cultivation area referred to the area of land under his/her management only for maize cultivation. The area was estimated in terms of full benefit to a farmer or his/her family.

Training exposure on maize cultivation: Training exposure of a respondent referred to the number of days a respondent was trained on maize cultivation. The measurement covered the period from the day of starting training on maize cultivation to the day of data collection.

Annual family income: Annual family income referred to the total earnings of a respondent and the members of his family from agricultural and non-agricultural sources (business, services, daily labour etc.) during the previous year.

Extension media contact: It referred to an individual's exposure to or contact with different communication media, and sources and personalities being used for dissemination of new technologies among the farmers.

Cosmopolitaness: The term cosmopolitaness referred to the rural farmers' mobility from their own village to another village, upazila, district and other places.

Knowledge: Knowledge is operationally defined for the purpose of this investigation as 'those behaviors and test situations, which emphasized the remembering either by recognition or recall of ideas, material or phenomenon'. It referred to the amount of understood information possessed by the farmers on various aspects of maize cultivation.

Problem faced: Problem faced referred to the degree of difficulties faced by concerned people in accomplishment of particular project activities. In this study problem faced meant extent of problem maize growers faced problems in maize cultivation.

Maize farmers: Maize farmers referred to those farmers who have cultivated maize during the Rabi season of 2014-2015. The terms were used synonymously as maize, farmers, respondents and subjects. They, however, have cultivated other crops too.

CHAPTER 2

REVIEW OF LITERATURE

Attempt has been made in the present chapter to review some interlinked literature on this aspect from home to abroad. The interlinked reviews conveniently presented on the major objectives of the study as far as possible. This chapter is divided into three major sections. The first section deals with review of relevant literature regarding problem faced by the farmers in maize cultivation. The second section deals with past research findings relating to the relationship of problem faced by the farmers in maize cultivation with their selected characteristics. The conceptual framework of the study is presented in the third section.

2.1 Review of Relevant Literature Regarding Problems Faced by the Farmers in Maize Cultivation

King (1980) showed that the problems of cotton development project in Gambia were dominated by three main factors that are: (1) low yield, (2) high labour input (3) the relative price paid to the farmers for groundnut and cotton. There were no technical reasons why cotton cannot be grown.

Arya and Shah (1984) conducted a study in the mid-Himalayan Region of Uttar Pradesh of India to find out the existing and potential level of food production and main constraints on the adoption of new technology for rainfed agriculture. The main constraint identified were (1) small and skewed distributed holdings, (2) fragmented and scattered holdings, (3) shortage of labour, (4) lack of availability of inputs and funds and (5) lack of education, training and extension especially for women.

Raha *et al.* (1986) identified some common problem of cotton cultivation as perceived by the farmers in Bangladesh. Those were lack of suitable land, lack of irrigation facility, shortage of labour, shortage of cash money, lack of technical knowledge, lower price of cotton and non-availability of seed, insecticide and fertilizer.

Marothia (1983) conducted a study to find out the constraints in the adoption of paddy technologies in two villages in Raipur block, Madhya Pradesh, India. The findings revealed that the majority of farmers still adopt a partial package of recommendations, mainly due to the high cost of input, financial limitations and risk of crop failure. Inadequate supportive input facilities were found to be responsible for the slow adoption of paddy technology.

Kher and Halyal (1988) administered a research work to identify the constraint in adoption of sugarcane production technology. The most important constraint identified regarding the adoption of input in sugarcane production technology were irregular and insufficient electricity supply, small size of holding for green manuring inconvenience of inter cropping due to weeds, high cost of farm fuel, scarce irrigation facility, absence of location specific recommendations for earthing up, lack of drought resistant varieties and lack of technical knowledge about plant protection and chemical fertilizer.

Ramachandran and Sripal (1990) identified different constraint in adopting dry land technology for rain fed cotton in Kamaraz district, Tamilnadu, India. They found that farmers faced constraints which included insufficient rainfall susceptibility of pest and diseases, lack of experience, unavailability of inputs in time, lack of knowledge, in sufficient livestock, risk due to failure of monsoon , high cost etc.

Chander *et al.* (1990) in their study identified constraints in potato cultivation. Main constraints were ignorance about improved cultivars and cultivation practice, ignorance about time and number of irrigations, ignorance about scientific method of sowing, lack of guidance of marketing of potato, high cost of improved cultivars, high cost of fertilizers, pesticide and irrigation, lack of enough space for storing potatoes scientifically and so on.

Freeman and Breth (1994) conducted a study on productivity of agricultural systems in the West African savanna. The study showed several constraints in farming practices such as intensified land use, fallow period decline and crop cultivation spreading ecologically fragile lands. In the absence of appropriate resource management technologies, those practices inevitably led to degradation of the resource base with important implication with soil productivity, household food security and rural poverty.

Gumisiriza *et al.* (1994) showed several constraints of wheat production in Uganda. Those were: traditional farming practices, unavailability or lack of improved cultivars, information and technology transfer, rust and foliar diseases and ineffective communication between research stations.

Ismail (2001) conducted a study on problem faced by the farm youth of haor area of Mohongonj Upazila. The study revealed six top problems in rank order which were: (1) no arrangement of loan for the farm youth for fishery cultivation, (2) lack of government programs in agriculture for the farm youth, (3) absence of loan giving agencies for establishing farm in locality, (4) general people face problem for fishery due to government leasing of Jalmohal, (5) lack of government programs for establishing poultry farm and (6) lack of agricultural loan for the farm youth.

Pramanik (2001) made an extensive study on 24 problems of farm youth in Mymensingh district relating to different problem in crop cultivation .Out of 24 problems the top 4 problems in rank order were: (1) local NGOs take high rate of interest against a loan, (2) lack of agricultural machinery and tools, (3) lack of cash and (4) financial inability to arrange improved seeds, fertilizer and irrigation.

Agnew *et al.* (2002) found several barriers to adoption of Harvesting Based Practice (HBP) have slowed progress. These include low sugar price, wet weather, orange rust disease, system of harvester payment, insufficient cane quality feedback mechanisms and physical, time and safety upon harvesting.

Salam (2003) in his study identified constraints in adopting environmentally friendly farming practices. Top six identified constraints according to their rank order were: (i) low production due to limited use of fertilizer, (ii) lack of organic matter in soil, (iii) lack of Govt. support for environmentally friendly farming practices, (iv) lack of capital and natural resources for integrated farming practices, (v) lack of knowledge on integrated farm management and (vi) unavailability of pest resistant varieties of crops.

Uddin (2004) in his study identified five aspects of constraints in commercial cultivation of vegetables viz. seed constraints, disease and insect infestation constraints, field management constraints, marketing of vegetable constraints and extension work constraints. Among these aspects of constraints he revealed disease and pest infestation constraints severely faced by the farmers.

2.2 Review of Literature concerning the Relationship between Farmers' Selected Characteristics and their Problems Faced

2.2.1 Age and problem faced

No study was found on the study of relation between problems faced in maize cultivation and age. However, there is other study relevant to problem faced by maize farmers have been stated below:

Hossain (1985) in a study on landless labourers in Bhabakhali Union of Mymensingh district found that there was no relationship between the landless labourers and their problem confrontation. Similar findings were obtained by Rahman (1995), Ali (1987), Rashid (1999), Pramanik (2001), Ahmed (2002) and Salam (2003) in their respective studies.

Kashem (1997) conducted study on the landless labourers of Barakhata Union under Rangpur district and attempted to find out the relationship between age of the landless labourers and their problem confrontation. He found no relationship between age of the landless labourers and their problem confrontation.

Mansur (1989) found that age of the farmers had no significant relationship with the feeds and feeding problem confrontation.

Bhuiyan (2002) in his study found a positive and significant relationship between age of the farmers and their constraints in banana cultivation. Similar findings were obtained by Rahman (1996) in his respective study.

Rashid (2003) found that age of the rural youth had significant negative relationship with problem confrontation in selected agricultural production activities.

2.2.2 Level of education and problem faced

No study was found on the study of relation between problems faced in maize cultivation and level of education. However, there is other study relevant to problem faced by maize farmers have been stated below:

Saha (1997) in his study on poultry problem confrontation in respect of breeding of poultry stated that there was negative relationship between education of the farmers and their poultry problem confrontation.

Kashem (1977) in his study found a significant negative relationship between education of the landless labourers and their problem confrontation.

Aziz (2006) in his study revealed that there was no significant relationship between education and constraints faced by the farmers in potato cultivation.

Islam (1987) in his study found a significant and negative relationship between education of the farmers and their problem confrontation on artificial insemination. Similar findings were obtained by Mansur (1989), Rahman (1995), Haque (1995), Rahman (1996), Karim (1996), Faroque (1997), Pramanik (2001), Ahmed (2002), Hossain (2002), Bhuiyan (2002) and Salam (2003) in their respective studies.

Haque (2001) found a significant negative relationship between education and problem confrontation of the Farmers Field School (FFS) farmers in practicing IPM.

2.2.3 Family size and problem faced

Haque (1995) found that there was no significant relationship between family size and problem confrontation of the Mohila Bittaheen Samabaya Samittee. Similar findings were obtained by Rashid (1999), Bhuiyan (2002), Hossain (2002) and Ahmed (2002) in their respective studies.

Salam (2003) in his study found a positive significant relationship between family size and their problem onfrontation in adopting environmentally friendly farming practices.

Rahman (1995) found that there was no significant relationship between family size of the pineapple growers and their problem confrontation. He also found negative tendency between the concerned variables.

Hossain (1985) found in his study that there was no relationship between family size of the landless labourers and their problem confrontation.

2.2.4 Farm size and problem faced

Kashem (1977) found a significant negative relationship between borga farm size of the landless labourers and their problem confrontation.

Hossain (1985) in his study found a significant relationship between borga farm size of the landless labourers and their problem confrontation.

Hoque (2001) revealed that significant positive relationship existed between farm size and problem confrontation of the FFS farmers in practising IPM.

Rashid (2003) found that farm size of the rural youth had no relationship with problem confrontation in selected agricultural activities.

Sarker (1983) found that farm size of the farmers had a significantly negative influence on their poultry constraints faced.

Ali (1987) in his study found a negative relationship between the farm size of the farmers and cattle problem confrontation of farmers.

Lionberger (1966) after reviewing the situational factors from the related literature in the field of adoption of new ideas and practices concluded that size of farm was nearly always positively related to the adoption of new farm practices.

Roy (2007) in his study found no significant relationship between farm size under maize cultivation and constraints faced by farmers in maize cultivation.

Aziz (2006) revealed that there was no significant relationship between farm size and constraints faced by the farmers in maize cultivation.

2.2.5 Annual family income and problem faced

No study was found on the study of relation between problems faced in maize cultivation and annual family income. However, there is other study relevant to problem faced by maize farmers have been stated below:

Kashem (1977) in his study examined the relationship between income of the landless labourers and their problem confrontation. Though the relationship was not statistically significant, the data indicated an appreciable negative trend between the two variables.

Hossain (1985) found a significant relationship between income and problem confrontation of the land less labourers.

Islam (1987) reported that the relationship between income and artificial insemination problem confrontation was negatively significant.

Raha (1989) found in his study found that income of the farmers had no significant relationship with their irrigation problem confrontation.

Mansur (1989) did not find any significant relationship between income of the farmers and their problem confrontation in feeds and feeding cattle. However, the trend of the relationship was negative.

Hoque (2001) found in his study that annual family income of FFS farmers had a positive significant effect on their problem confrontation.

Rahman (1995) found in his study that annual family income of the farmers had a significant negative effect on their problem confrontation in pineapple cultivation.

Karim (1996) found in his study that annual family income of the farmers had a significant negative effect on their problem confrontation in kakroal cultivation.

2.2.6 Maize cultivation area and problem faced

No study was found on the study of relation between problems faced in maize cultivation and maize cultivation area. However, there is other study relevant to problem faced by maize farmers have been stated below:

Raha (1989) found in his study found that there was no significant relationship between the farmers' area under irrigation and their irrigation problem confrontation. On the other hand, similar findings were obtained by Mansur (1989).

Rahman (1995) found a significant and negative relationship between area under cotton cultivation of the farmers and their faced constraint.

Bhuiyan (2002) in his study found no significant relationship between area under banana cultivation of the farmers and their constraints in banana cultivation.

Halim (2003) in his study constraints faced by the farmers in adopting crop diversification found that there was positive and significant relationship between area under rice cultivation of the farmers and their problem confrontation.

Karmaker (2004) in his study found no significant relationship between pond area of the farmers and their constraints in adopting aquaculture techniques.

2.2.7 Training exposure in maize cultivation and problem faced

No study was found on the study of relation between problems faced in maize cultivation and training exposure on maize cultivation. However, there is other study relevant to problem faced by maize farmers have been stated below:

Anwar (1994) found that rural youth faced various problems in training and the top three problems in rank order were: i) no arrangement of training on rural and agricultural development of the upazila. ii) no scope to have training on improved agricultural practices. iii) no arrangement for vocational training in the upazila.

Saha (1997) found that training experience of the youth had no relationship with their problem confrontation.

Ahmed (2002) showed that training exposure of the farmers had a significant negative relationship with their problem confrontation in jute seed production.

Ali (1999) found that training experience of the rural youth had no relationship with the problem confrontation in self-employment by undertaking selected agricultural income-generating activities.

2.2.8 Extension media contact and problem faced

No study was found on the study of relation between problems faced in maize cultivation and extension media contact. However, there is other study relevant to problem faced by maize farmers have been stated below:

Raha (1989) found that extension contact of the farmers had no significant relationship with irrigation problem confrontation. However, the relationship showed a tendency in the negative direction.

Rahman (1995) in his study concluded that extension contact of the farmers had significant negative relationship with their faced problem in cotton cultivation. Similar findings were obtained by Faroque (1997), Pramanik (2001), Hossain (2002), Bhuiyan (2002) and Salam (2003) in their respective studies.

The study of Ismail (2001) revealed that there was no significant relationship between extension contact of the farmers and their agricultural problem confrontation. Similar findings were obtained by Hoque (2001) in study.

Akanda (2005) reported that there was significant positive relationship between communication exposure and technological gap in cultivating transplanted modern aman rice.

Hasan (2005) in his study found that there was no relationship between extension contact of the farmers and their problem confrontation in crop production activities.

2.2.9 Cosmopolitanism and problem faced

No study was found on the study of relation between problems faced in maize cultivation and cosmopolitanism. However, there is other study relevant to problem faced by maize farmers have been stated below:

Rashid (1975) found that there was a negative relationship between cosmopolitanism of the farmers and their agricultural problem confrontation.

Kashem (1977) found that there was no significant relationship between cosmopolitanism of the landless labourers, but existed a negative trend between the two variables.

2.2.9 Knowledge on maize cultivation and problem faced

No study was found on the study of relation between problems faced in maize cultivation and knowledge on maize cultivation. However, there is other study relevant to problem faced by maize farmers have been stated below:

Raha(1989) reported from his study that farmers knowledge in irrigation of modern boro rice had no significant relationship with their irrigation problem confrontation. Anwar (1994), Karim (1996), Ali (1999), Rashid (1998), Ismail (2001), Salam (2003), and Rashid (2003) found similar findings in their respective studies.

Mansur (1989) found in his study that there was a substantial significant negative relationship between knowledge in feeds and feeding cattles of the farmer and their problem confrontation in feeds and feeding. Similar findings were obtained by Sarker (1983), Rahman (1996), Hoque (2001), Hossain (2002) and Ahmed (2002) in their respective studies.

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

2.3 Conceptual Framework of the Study

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research while constructed properly contains at least two important elements i.e. a dependent variable and an independent variable. A dependent variable is that factor which appears, disappears or varies the researcher introduces, removes or varies as the independent variables. An independent variable is that factor which is manipulated by the researcher in this attempt to ascertain its relationship to an observed phenomenon. A simple conceptual framework for the study is shown in Figure 2.1.

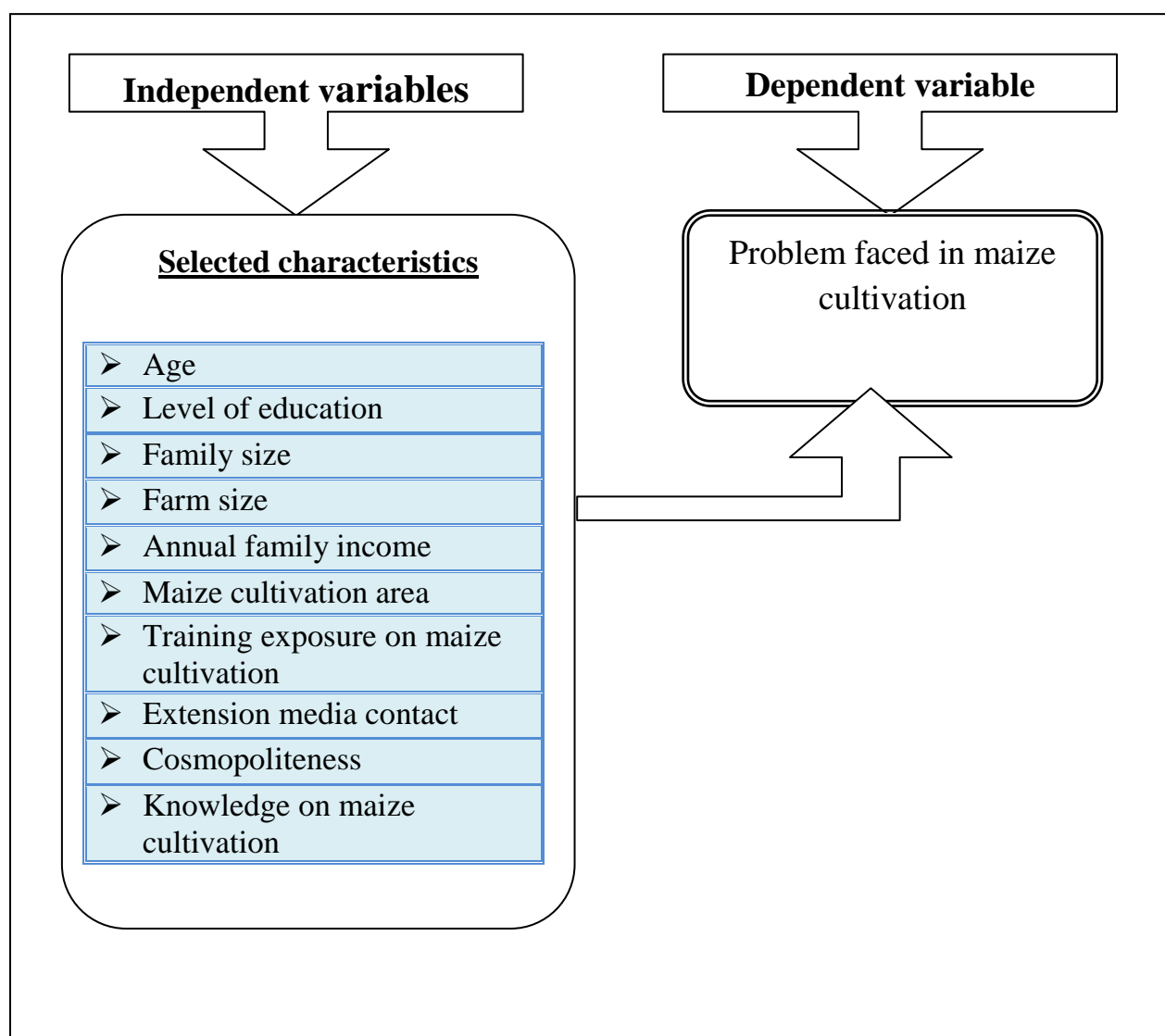


Figure 2.1 the Conceptual Framework of the Study

CHAPTER 3

MATERIALS AND MEHODS

In conducting a research study, methodological issue is one of the prime considerations for yielding of valid and reliable findings. Appropriate methodology enables the researcher to collect valid and reliable information and to analyze the information properly in order to arrive at correct conclusions. However, the methods and operational procedures followed in conducting this study has been described in the subsequent sections of this Chapter.

3.1 The Locale of the Study

The study was conducted among the maize growers of four villages of Nabagram Union of Manikganj Sadar Upazila under Manikganj District. Out of ten Unions of this Upazila, Nabagram Union was purposively selected because maize are grown plenty in this union. From these Union four villages (Baliabil, Bengroi, Baroil and Gilondo) were selected randomly from 14 villages of this Union. The map of Bangladesh showing Manikganj district appears in the Figure 3.1. A map of Manikganj district showing Manikganj Sadar Upazilla and a map of Manikganj Sadar Upazila showing the study area have been shown in Fig 3.2 and 3.3 respectively.

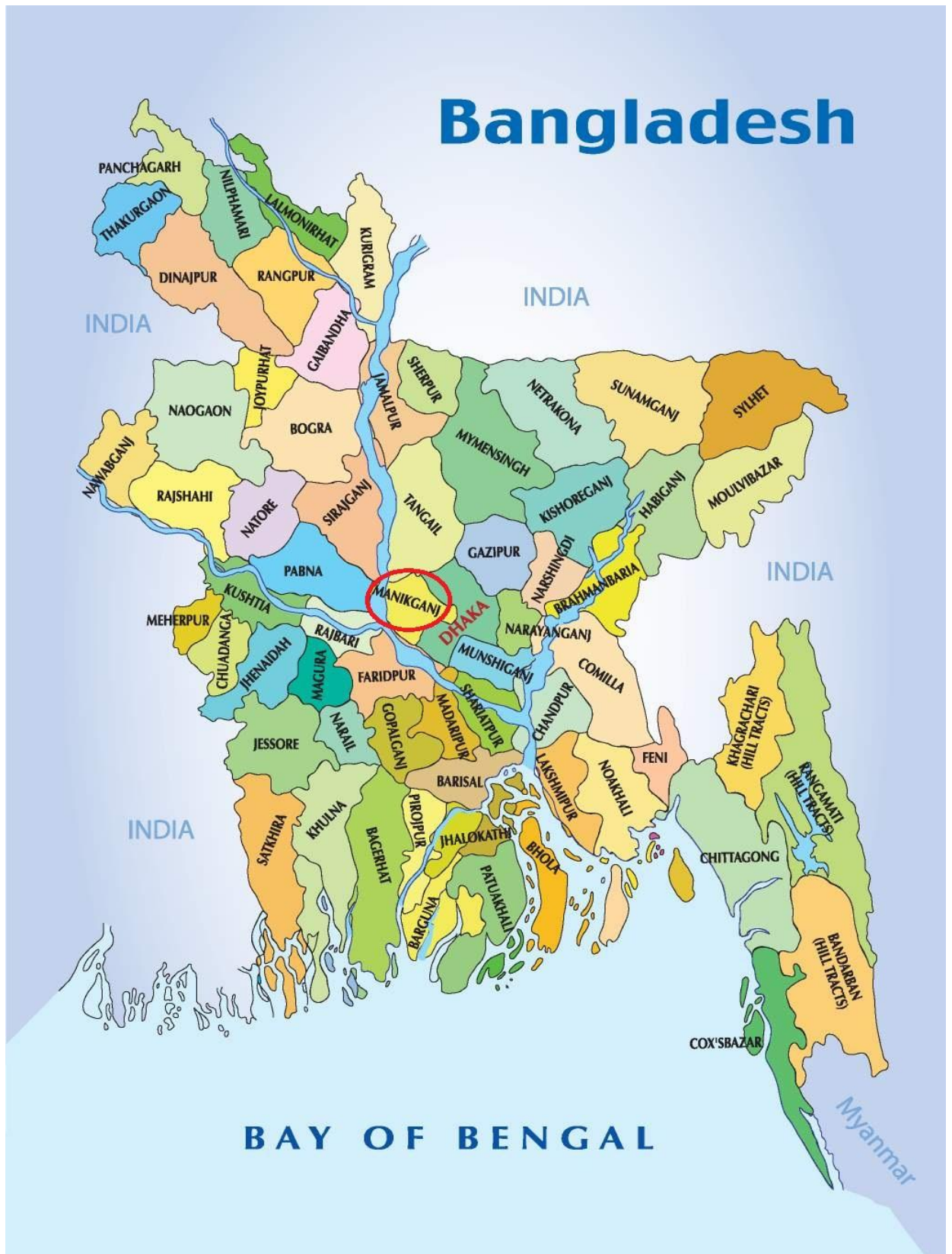


Figure 3.1 A Map of Bangladesh showing Manikganj District



Figure 3.2 A Map of Manikganj District showing Manikganj Sadar Upazila

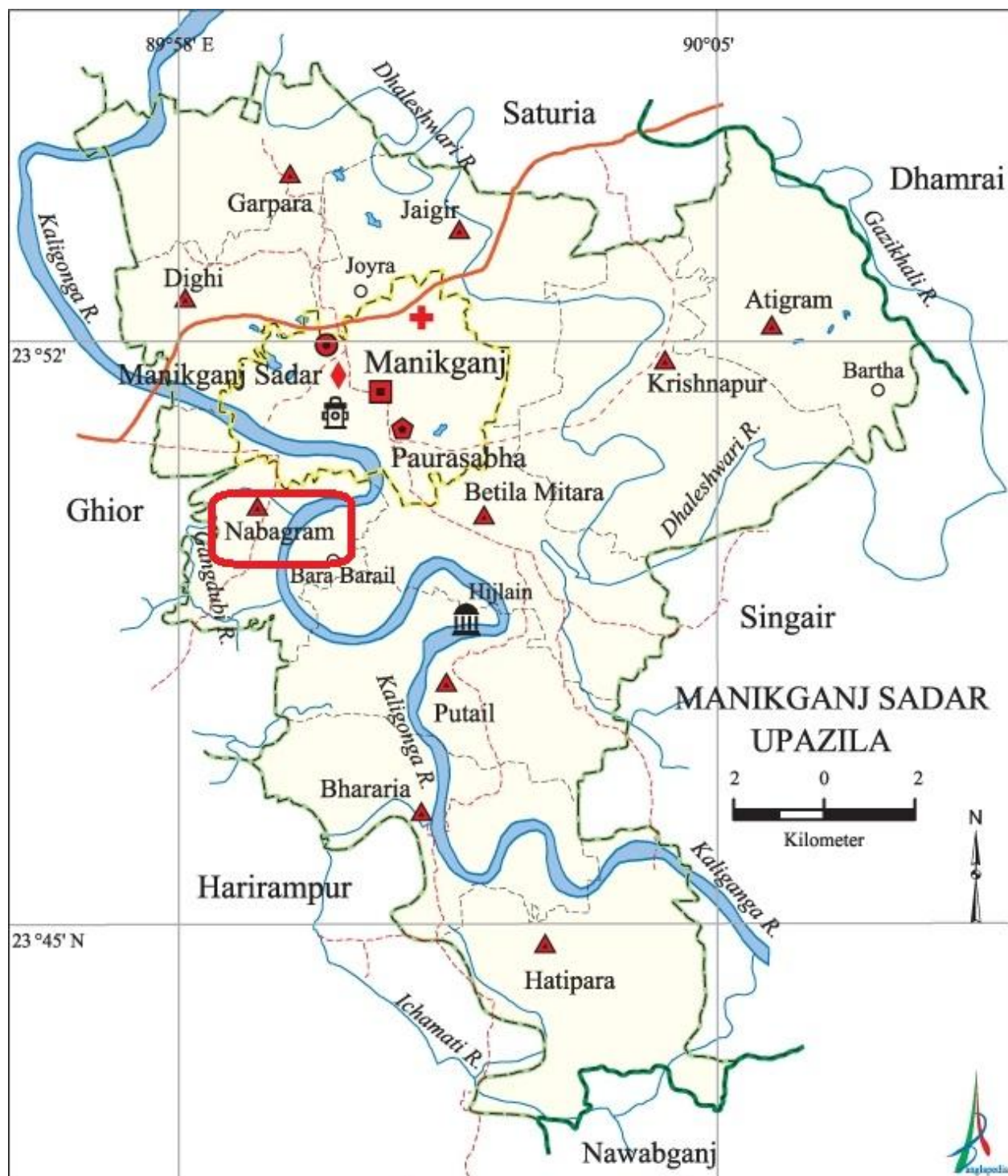


Figure 3.3 A map of Manikganj Sadar Upazila showing the study area (Nabagram Union)

3.2 Population and Sample of the Study

A list of maize growers of the study area was prepared by the researcher himself with the help of the Sub Assistant Agriculture Officer (SAAO) of

Manikganj Sadar Upazila Agriculture Office. The list comprised a total 202 maize growers in the study area. These farmers constituted the population of this study. To make a representative sample 40 percent of the population was selected using proportionately random sampling technique. Thus eighty two (82) maize growers were selected as the sample of the study. The village-wise distribution of the population and sample of farmers are shown in Table 3.1.

Besides this, 10 percent of the sample were selected randomly as reserves who were supposed to be interviewed only when a respondent in the original sample list was unavailable during data collection.

Table 3.1 Distribution of the population and sample of the respondents in four villages of Nabagram union with reserve list

Villages	Population (No. of total maize growers)	Sample Size (40%)	Reserve list (10%)
Baliabil	52	21	5
Bengroi	37	15	4
Baroil	48	20	5
Gilondo	65	26	6
Total	202	82	20

3.3 Data Collecting Instrument

In a social research, preparation of an interview schedule for collection of information with very careful consideration is necessary. Keeping this fact in mind the researcher prepared an interview schedule carefully for collecting data from the respondents. Objectives of the study were kept in view while preparing the interview schedule.

The initially prepared interview schedule was pre-tested among 15 respondents of the study area. Those 15 respondents were excluded while selecting sample. The pretest was helpful to find out gaps and to locate faulty questions and statements. Alterations and adjustments were made in the schedule on the basis of experience of the pretest. English version of the interview schedule is shown in appendix-A.

3.4 Collection of Data

The researcher collected data from the sample farmers with the help of a pretested interview schedule. Before starting collection of data, the researchers met with the Sub Assistant Agriculture Officer of the respective blocks in order to explain the objectives of the study and requested them to provide necessary help and co-operation in collection of data. 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 for interview they were informed earlier, so that they would be available in their respective area. The interviews were held individually in the house or farms of the respective respondent. The researcher established adequate rapport so that the respondents did not feel hesitant to provide actual information. Whenever any respondent faced difficulty in understanding a particular question, the researcher took care to explain the same clearly. No serious constraints were faced by the researcher in collecting data. Collection of data took 30 days from 15th January to 13th February, 2015.

3.5 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 his understanding about the nature and scope of the variables involved in research studies. Ezkiel 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, an independent variable and a dependent variable. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationships to an observed phenomenon (Townsend, 1953). A dependent variable is that factor which appears, disappears or varies as the experimenter introduces, removes or varies in the independent variables. The dependent variable is often called the criterion or predicted variable, where as the independent variable is called the treatment, experimental and antecedent variable (Dalen, 1977).

3.6 Selection of Dependent and Independent Variables

Problem faced by the farmers in maize cultivation was the main focus of this study and it was considered as the dependent variable.

For selection of independent variables the researcher went through the past related literature as far as available. He discussed with the researcher, experts in the relevant fields and research fellows in agricultural and related disciplines. He also carefully noticed the various characteristics of the farmers of the study. Availability of time, money and other resources were also kept in view in selecting the variables. Characteristics of the farmers like age, level of education, family size, farm size, annual family income, maize cultivation area, training exposure on maize cultivation, organizational

participation, extension contact, cosmopolitaness and knowledge on maize cultivation were selected as the independent variables.

3.7 Measurement of Variables

In order to conduct the study in accordance with the objectives, it was necessary to measure the selected variables. This section contains procedures for measurement of both independent as well as dependent variables of the study. The procedures followed in measuring the variables are presented below:

3.7.1 Measurement of independent variables

It was pertinent to follow a methodological procedure for measuring the selected variables in order to conduct the study in accordance with the objectives already formulated. The procedures for measuring the independent variables are described below:

3.7.1.1 Age

Age of a respondent was measured in terms of years from birth to the time of interview which was found on the basis of response (Azad, 2003). A score of one (1) was assigned for each year of age. Question regarding this variable appears in item no. 1 in the interview schedule (Appendix-A).

3.7.1.2 Level of education

Education was measured in terms of one's year of schooling. One score was given for passing each year in an educational institution (Amin, 2004). For example, if the respondent passed the S.S.C. examination, his education score was given as 10, if passed the final examination of class Seven (VII), his education scores was given as 7. If the respondent did not know how to read and write, his education score was given as '0' (zero). A score of 0.5 (half) was given to that respondent who could sign his/her name only.

Question regarding this variable appears in the item no. 2 in the interview schedule (Appendix-A).

3.7.1.3 Family size

The family size was measured by the total number of members in the family of a respondent. The family members included family head and other dependent members like husband/wife, children, etc. who lived and ate together. A unit score 1 was assigned for each member of the family. If a respondent had five members in his/her family, his/her family size score was given as 5 (Khan, 2004). Question regarding this variable appears in the item no. 3 in the interview schedule (Appendix-A).

3.7.1.4 Farm size

Farm land is the most important capital of a farmer and the farm size can influence on many personal characteristics of a farmer. Farm size of the farmer was measured by the land area possessed by him. Data obtained in response to questions under item No. 4 of the interview schedule (Appendix-A) formed the basis for determining the farm size of the respondent. Farm size was computed by using the following formula:

$$\text{Farm size} = A_1 + A_2 + A_3 + \frac{1}{2} (A_4 + A_5) + A_6 + A_7$$

A_1 = Homestead Area

A_2 = Own land under own cultivation

A_3 = Land taken on lease from others

A_4 = Land taken on barga from others

A_5 = Land given to others as barga

A_6 = Pond

A_7 = Fellow land

The respondent farmers indicated their farm size in local unit. Finally, it was converted into hectare and was considered as the farm size of the respondents.

3.7.1.5 Annual family income

Annual family income of a respondent was measured in '000' taka on the basis of total yearly earning from agricultural and non agricultural sources by the respondent himself and other family members.

3.7.1.6 Maize cultivation area

Maize cultivation area was measured by the area of land under his/her management only for maize cultivation. The unit of measurement was in ha and was considered as the maize cultivation area of a respondent.

3.7.1.7 Training exposure on maize cultivation

Training was measured by the total number of days a respondent received training in his/her life on maize cultivation. A score of 1 (one) was given to a respondent for each day of training. A zero (0) score was assigned for no training exposure.

3.7.1.8 Extension media contact

The term extension media contact referred to one's becoming accessible to the influence of extension education through different extension media. It was measured with nine selected extension media. A scale was developed arranging the weights 0, 1, 2 and 3 for the responses as not at all, rarely, occasionally and frequently respectively. Thus, extension media contact of the respondents could range from 0 to 27, where 0 indicating no extension media contact and 27 indicating very high extension media contact.

3.7.1.9 Cosmopolitanness

Cosmopolitanness of a respondent was measured by computing a cosmopolitanness score based on his/her frequency of visit to selected eight

(8) different places outside his/her own social environment. Each respondent was asked to indicate the number of times he/she visited to each of the eight different places. Scores were assigned to his/her response in the following ways :

Place of visit	Nature of visit	Weight
Other village	Not even once a month	0
	1-3 times a month	1
	4-5 times a month	2
	6 or more times a month	3
Local market	Not even once a month	0
	1-3 times a month	1
	4-5 times a month	2
	6 or more times a month	3
Own union parishad	Not even once a month	0
	1-2 times a month	1
	3-4 times a month	2
	5 or more times a month	3
Own upazila headquarter	Not even once a month	0
	1-2 times a month	1
	3-4 times a month	2
	5 or more times a month	3
Other upazila (s)	Not even per three months	0
	1-2 times three months	1
	2-3 times three months	2
	3 or more times three months	3
Own District town	Not even per six months	0
	1-2 times per six months	1
	3-4 times per six months	2
	5-6 times per six months	3
Other District Sadar (per year)	Not even once a year	0
	Once a year	1
	2-3 times per year	2
	4 times per year	3
Capital city (per year)	Not even once a year	0
	Once a year	1
	Twice a year	2
	Thrice or more a year	3

The weights for visit to all the places were added together to obtain the cosmopolitanism score together to obtain the cosmopolitanism score of a respondent. This score could range from 0 to 24, zero indicating no cosmopolitanism at all and 24 highest level of cosmopolitanism of a respondent.

3.3.1.10 Knowledge on maize cultivation

Knowledge on maize cultivation score of a respondent was measured by asking him/her 21 questions on different aspect of maize cultivation. A score 2 was assigned to each correct question so an individual could get 2 for correct answer and 0 for no or wrong answer to each question. Partial score were assigned for partial correct answer. Thus, the maize cultivation knowledge of the respondents could range from 0 to 42, where 0 indicating poor knowledge and 42 indicating high knowledge on maize cultivation.

3.7.2 Measurement of dependent variable

Problems faced by the maize farmers were the dependent variable of the study. It was measured by constructing a scale of 16 selected items. Each maize farmer was asked to indicate the extent of problems faced by him/her against 16 selected items. By indicating one of the four alternative responses such as high, medium, low and not at all problems and weights were assigned to these responses as 3, 2, 1 and 0 respectively. Score of problem faced in maize cultivation of a respondent was computed by adding all the scores obtained by those responses from all the 16 problem items. So the problems faced score of the respondents ranged from 0 to 48, where 0 indicating no problem and 48 indicating highest problems in maize cultivation.

To compare severity of the problems, Problem Faced Index (PFI) was measured as follows:

$$\mathbf{PFI = (P_s \times 3) + (P_m \times 2) + (P_l \times 1) + (P_n \times 0)}$$

Where,

PFI = Problem Faced Index

P_s = Number of respondents facing severe problem

P_m = Number of respondents facing moderate problem

P_1 = Number of respondents facing little problem

P_n = Number of respondents facing no problem

3.8 Statement of the Hypotheses

As defined by Goode and Hatt (1952) a hypothesis is “a proposition which can be put to test to determine its validity. It may seem contrary to, or in accord with common sense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test.”

3.8.1 Research hypotheses

In the light of the objectives of the study and variables selected, the following research hypotheses were formulated to test them. The research hypotheses were stated in positive form, the hypotheses were as follows:

“Each of the selected characteristics of the farmers had relationship to their problem faced in maize cultivation.”

3.8.2 Null hypotheses

In order to conduct statistical tests, the research hypotheses were converted to null form. Hence, the null hypotheses were as follows:

“Each of the selected characteristics of the farmers had no relationship to their problem faced in maize cultivation.”

3.9 Data Processing

3.9.1 Editing

The collected raw data were examined thoroughly to detect errors and omissions. As a matter of fact the researcher made a careful scrutiny of the completed interview schedule to make sure that necessary data were entered as complete as possible and well arranged to facilitate coding and tabulation. Very minor mistakes were detected by doing this, which were corrected promptly.

3.9.2 Coding and tabulation

Having consulted with the research supervisor and co-supervisor, the investigator prepared a detailed coding plan. In case of qualitative data, suitable scoring techniques were followed by putting proper weight against each of the traits to transform the data into quantitative forms. These were then tabulated in accordance with the objective of the study.

3.9.3 Categorization of data

Following coding operation, the collected raw data as well as the respondents were classified into various categories to facilitate the description of the independent and dependent variables. These categories were developed for each of the variables by considering the nature of distribution of the data and extensive literature review. The procedures for categorization have been discussed while describing the variables under consideration in chapter iv.

3.10 Statistical Analysis

Data collected were coded, compiled, tabulated and analyzed in accordance with the objectives of the study. The statistical measures such as range, mean, standard deviation, percentage etc were used for describing both the independent and dependent variables. Tables were also used in presenting data for clarity of understanding. To find out the relationship of selected characteristics of the maize growers with each of their problems faced in maize cultivation, Pearson's Product Moment Co-efficient of Correlation was used. Five percent (0.05) level of probability was used as the basis for rejection of a null hypothesis throughout the study. Co-efficient values significant at 0.05 level is indicated by one asterisk (*), and that at 0.01 level by two asterisks (**).

CHAPTER IV

FINDINGS AND DISCUSSION

Purpose of this Chapter was to describe the findings of the present study. The study investigated problem confrontation of the farmers in maize production activities and related matters. In accordance with the objectives of the study, presentation of the findings has been made in three sections of this Chapter.

Section 1: Selected Characteristics of the Maize Farmers

Section 2: Problem Faced by the Farmers

Section 3: Relationship between the Selected Characteristics of the Farmers and their Problem faced

4.1 Selected Characteristics of the Maize Farmers

This section deals with the characteristics of maize farmers which were assumed to be associated with the problem faced in maize cultivation. Different farmers possess different characteristics which are focused by his/her behavior. In this section ten characteristics have been discussed. The selected characteristics of the farmers were; age, level of education, family size, farm size, annual family income, maize cultivation area, training exposure on maize cultivation, extension media contact, cosmopolitaness and knowledge on maize cultivation. Measuring unit, range, mean and standard deviations of those characteristics of maize growers were described in this section. Table 4.1 provides a summary profile of maize growers' characteristics.

Table 4.1 Characteristics profile of the Maize farmer

Sl. No.	Characteristics (with measuring unit)	Range		Mean	Standard deviation
		Possible	Observed		
01	Age (years)	Unknown	29 - 65	44.44	8.20
02	Level of education (schooling years)	Unknown	0 - 18	4.03	4.54
03	Family size (number of members)	Unknown	4-10	5.39	1.46
04	Farm size (hectare)	Unknown	0.39 - 2.08	0.86	0.29
05	Annual family income (‘000’Taka)	Unknown	55 – 280	102.89	48.24
06	Maize cultivation area (hectare)	Unknown	0.10 - .71	0.34	0.15
07	Training exposure on maize cultivation (number of days)	Unknown	00 - 09	1.78	1.99
08	Extension media contact (score)	0 - 27	5 - 24	11.49	4.50
09	Cosmopolitaness (score)	0 - 24	7 - 21	13.18	3.14
10	Knowledge on maize cultivation (score)	0 - 42	20-40	28.48	4.13

4.1.1 Age

Age of the respondents varied from 29 to 65 years, the average being 44.44 years with the standard deviation of 8.20. According to their age, the respondents were classified into three categories as “young aged” (up to 35 years), “middle aged” (36- 50 years) and “old aged” (above 50 years). The distribution of the farmers according to their age is shown in Table 4.2.

Table 4.2 Distribution of the maize farmers according to their age

Categories	Basis of categorization (year)	Farmers		Mean	Standard deviation
		Number	Percent		
Young	up to 35	11	13.4	44.44	8.20
Middle-aged	36-50	51	62.2		
Old	Above 50	20	24.4		
Total		82	100		

Data presented in Table 4.2 indicate that more than three fifth (62.20 percent) of the respondents were middle aged as compared to 13.40 percent being young and 24.40 percent old. Findings again revealed that slightly above three fourth (75.60 percent) of the respondents were young to middle aged. Therefore, it could be said that decision regarding the farming practices in the study area were expected to be considerably influenced by the young and middle aged farmers.

4.1.2 Level of education

Education level of the respondents ranged from 0-18 in accordance with year of schooling. The average education score of the respondents was 4.03 with a standard deviation of 4.54. On the basis of their level of education, the farmers were classified into four categories as shown in Table 4.3.

Table 4.3 Distribution of the maize farmers according to their level of education

Categories	Basis of categorization (schooling year)	Farmers		Mean	Standard deviation
		Number	Percent		
Illiterate	0 – 0.5	44	53.7	4.03	4.54
Primary	1-5	8	9.8		
Secondary	6-10	23	28.0		
Above secondary	above 10	7	8.5		
Total		82	100		

Data shown in the Table 4.3 indicate that 53.70 percent of the farmers was illiterate while 9.80 percent had primary level of education compared to 28 percent secondary level of education and 8.5 percent had above secondary level of education.

Education helps the farmers to face the adverse condition and adjust with unfavorable condition through reading leaflets, booklets, books and other printed materials in this case. Education helps the farmers to broaden their outlook and expand mental horizon by helping them to develop favorable attitude, correct perception and knowledge about maize production technology. Comparatively educated person is relatively more responsive to the technology and new innovation. The findings of this study, however, indicate that 53.70 percent of the farmers were illiterate which is supposed to face a great difficulty in adjusting with the unfavorable condition regarding maize cultivation. Such consideration indicates the need for improving literacy level among the farmers for adjusting the knowledge about maize cultivation.

4.1.3 Family size

The number of family members of the respondents ranged from 4 to 10 with an average of 5.39 and standard deviation of 1.46. Based on the family size the respondents were classified into three categories as small, medium and large family as shown in Table 4.4.

Table 4.4 Distribution of the maize farmers according to their family size

Categories	Basis of categorization (No. of family member)	Farmers		Mean	Standard deviation
		Number	Percent		
Small family	up to 4	25	30.5	5.39	1.46
Medium family	5-7	49	59.8		
Large family	Above 7	8	9.8		
Total		82	100		

Data furnished in the Table 4.4 indicate that the highest proportion (59.80%) of the respondents had medium family size consisting of 5 to 7 members, while 30.50% of the respondents belonged to the category of small family compared to 9.80% of them having large family size.

4.1.4 Farm size

Farm size of the respondents ranged from 0.06 hectare to 2.17 hectares with the mean of 0.38 and standard deviation of 0.33. On the basis of their farm size, the farmers were classified into three categories followed by DAE (1999) as shown in Table 4.5.

Table 4.5 Distribution of the maize farmers according to their farm size

Categories	Basis of categorization (ha)	Farmers		Mean	Standard deviation
		Number	Percent		
Small farm	0.2 - <1	61	74.4	0.86	0.29
Medium farm	1 - <3	21	25.6		
Total		82	100		

Data presented in the Table 4.5 demonstrate that about three fourth (74.40%) of the farmers had small farm compared to 25.60 percent having medium farm. In Bangladesh most of the farmers live on below a subsistence level and this in one of the vital reasons for not belonging large farm.

4.1.5 Annual family income

Annual family income of the respondents ranged from 55 to 280 thousand taka. The mean was 102.89 thousand taka and standard deviation was 48.24. On the basis of annual family income, the respondents were categorized into three groups as shown in Table 4.6.

Table 4.6 Distribution of the maize farmers regarding their annual family income

Categories	Basis of categorization ('000' taka)	Farmers		Mean	Standard deviation
		Number	Percent		
Low income	up to 100	56	68.3	102.89	48.24
Medium income	100.01-200	21	25.6		
High income	Above 200	5	6.1		
Total		82	100		

Data shown in Table 4.8 presented that the highest proportion (68.30%) of the respondents had low family income while 25.60 and 6.10 percent of the respondents had medium and high annual family income respectively.

The gross annual family income of a farmer is an important indicator of how much s/he can invest in his farming. Generally higher income encourages one's integrity to achieve better performance and to show his/her individual better status in the society. The higher income increases the risk taking capacity of the farmers' maize production. Farmers with low income generally invest less in their farms. It is therefore, likely that a considerable portion of farmers may face difficulty in maize cultivation.

4.1.6 Maize cultivation area

Maize cultivation area of the respondents varied from 0.10 to .71 hectare, the average being 0.34 ha with the standard deviation of 0.15. The respondents were classified into three categories on the basis of their maize cultivation area as shown in Table 4.7.

Table 4.7 Distribution of farmers according to maize cultivation area

Categories	Basis of categorization (ha))	Farmers		Mean	Standard deviation
		Number	Percent		
Small area	up to 0.2	20	24.4	0.34	0.15
Medium area	0.2 – 0.5	47	57.3		
Large area	Above 0.5	15	18.3		
Total		82	100		

Data furnished in Table 4.7 indicate that highest proportion (57.30%) of the respondents had medium area compared to 24.40 percent having small area and 18.30 percent having large area for maize production. Therefore, it could be said that the choice of maize production regarding the farming practices

in the study area are expected to be considerably influenced by the small and medium land of the farmers. So, they need comparatively cheaper technologies and target oriented special extension service for maize production.

4.1.7 Training exposure on maize cultivation

The score of training exposure on maize cultivation of the farmers ranged from 0-9 days. The mean was 1.78 days and standard deviation was 1.99. On the basis of training exposure on maize cultivation, the respondents were categorized into four groups as shown in Table 4.8.

Table 4.8 Distribution of the maize farmers according to their training exposure on maize cultivation

Categories	Basis of categorization (Days)	Farmers		Mean	Standard deviation
		Number	Percent		
No training	0	31	37.8	1.78	1.99
Low training	1-4	44	53.7		
Medium training	5-8	5	6.1		
High training	Above 8	2	2.4		
Total		82	100		

Data presented in the Table 4. 8 showed that majority (53.70%) of the farmers had low training exposure; while 37.80 percent of the farmers had no training exposure and 6.10 percent had medium exposure and only 2.40 percent had high training. It means that an overwhelming majority (91.50 percent) of the farmers had no or low training exposure. 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 knowledge and skill level on maize cultivation.

4.1.8 Extension media contact

The scores of the farmers regarding extension media contact ranged from 5-24 with a mean 11.49 and standard deviation 4.50. On the basis of their extension contact scores, the farmers were classified into three categories (Table 4.9).

Table 4.9 Distribution of the maize farmers according to their extension media contact

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	Percent		
Low contact	up to 10	46	56.1	11.49	4.50
Medium contact	11-20	30	36.6		
High contact	Above 20	6	7.3		
Total		82	100		

Data presented in the table 4.9 indicate that majority (56.10%) of the farmers had low extension media contact as compared to 36.60 percent having medium extension media contact and 7.30 percent had high extension contact. Thus, an overwhelming majority (92.70%) of the farmers had low to medium extension contact. Generally people having high extension media contact assume that they have more information regarding maize cultivation. More extension contact make the people acquainted with new technologies and information. Discussion with the agriculture related personnel makes the people more up to date about the modern practices. In the study area it is

noticed that farmers had low to medium extension media contact. That means they are not well acquainted with maize cultivation information.

4.1.9 Cosmopolitaness

The observed cosmopolitaness scores of the farmers ranged from 7-21 against the possible range of 0 to 24. The average cosmopolitaness scores of the farmers were 13.18 with a standard deviation of 3.14. On the basis of the cosmopolitaness scores, the farmers were classified into three categories (Table 4.10).

Table 4.10 Distribution of the maize farmers according to their extension media contact

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	Percent		
Low	up to 10	16	19.5	13.18	3.14
Medium	11-16	51	62.2		
High	Above 16	15	18.3		
Total		82	100		

Data presented in the Table 4.10 show that the highest proportion (62.20%) of the farmers had medium cosmopolitaness as compared to 19.50 percent having low cosmopolitaness and 18.30 percent having high cosmopolitaness. Thus, most (81.70%) of the farmers had low to medium cosmopolitaness.

4.1.10 Knowledge on maize cultivation

Knowledge on maize cultivation score of the respondents ranged from 20 to 40 against the possible range of 0 – 42 having an average of 28.48 and standard deviation of 4.13. On the basis of knowledge scores, the respondents were classified into three categories namely, ‘low knowledge’, ‘medium

knowledge’ and ‘high knowledge’. The distribution of the respondents according to their knowledge on maize cultivation is given in Table 4.11.

Table 4.11 Distribution of the farmers according to their knowledge on maize cultivation

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	Percent		
Low knowledge	<21	5	6.10	28.48	4.13
Medium knowledge	21-30	62	75.60		
High knowledge	>30	15	18.3		
Total		82	100		

Data of Table 4.11 show that more than three fourth of the respondents (75.60 %) of the respondents felt in medium knowledge category followed by 18.30 percent in high knowledge category and only 6.10 percent in low knowledge category. Knowledge is to be considered as vision of an explanation in any aspect of the situation regarding maize cultivation. It is act or state of understanding; clear perception of fact or truth, that helps an individual to foresee the consequence he may have to face in future. It makes individuals to become rational and conscious about related field. To perform optimum production, maize growers should have adequate knowledge on different aspects of maize cultivation.

4.2 Problem Faced in Maize Cultivation

Problem defined by Goode (1945) is any significant perplexing and challenging situation, real and artificial, the solution of which requires reflective “thinking”. Problem faced, therefore, refers to the extent to which individual faces difficult situations about which something needs to be done. The scores of problem faced in maize cultivation of the respondents ranged from 18 to 41 against the possible range of 0 – 48 with an average of 30.59 and standard deviation of 4.78. Based on the observed scores of problem faced in maize cultivation, the respondents were classified into the three categories i.e. low problem, medium problem and high problem faced. The distribution has been shown in Table 4.12.

Table 4.12 Distribution of the maize farmers according to their problem faced in maize cultivation

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	Percent		
Low	<25	4	4.9	30.59	4.78
Medium	25-35	64	78		
High	>35	14	17.10		
Total		82	100		

Majority (78%) of the respondents faced medium problem in maize production activities and 17.10 percent faced high problems and 4.90 percent faced low problems. Findings again reveal that near about all (95.10%) of the farmers faced medium to high problems in maize production. It is quite logical that farmers facing lower problems could minimize their losses in maize cultivation. Problem is a situation, matter, or person that presents perplexity or difficulty. It is negative situation that a farmer faces in his farming. It results negativity on farming. Farmers facing no or low problem

in farming, help to go for more cultivation and for that reason it helps to gain more knowledge. That means if a farmer faces no or low problem in maize cultivation it will encourage him/her to go for more maize production.

4.3 Relationship between the Selected Characteristics of the Farmers and Their Problem Faced in Maize Cultivation

The purpose of this section is to examine the relationship of 10 selected characteristics of the farmers with their problem faced in maize cultivation. The 10 characteristics of the farmers included: age, level of education, family size, farm size, annual family income, maize cultivation area, training exposure on maize cultivation, extension media contact, cosmopolitaness and knowledge on maize cultivation. Each of the characteristics constituted the independent variables, while problem faced in maize cultivation was the dependent variable. To explore the relationships between the selected individual characteristics of the farmers and their problem faced in maize cultivation, Pearson's product moment co-efficient of correlation (r) has been used. Five percent level of probability was used as the basis for rejection of a null hypothesis. The computed values of ' r ' were compared with relevant tabulated values for 80 degrees of freedom at the designated level of probability in order to determine whether the relationships between the concerned variables were significant or not.

The summary of the results of the correlation analysis has been presented in Table 4.13 showing the relationship between 10 characteristics of the farmers and their problem faced in maize cultivation. For clarity of understanding Appendix-B may be seen.

Table 4.13 Co-efficient of correlation showing relationship between selected characteristics of the maize farmers and their problem faced in maize cultivation

(n= 82 with df 80)

Dependent variable	Independent variable	Computed value “r”	Tabulated value of “r”	
			at 0.05 level	at 0.01 level
Problem faced in maize cultivation	➤ Age	- 0.070 ^{NS}	0.217	0.283
	➤ Level of education	- 0.083 ^{NS}		
	➤ Family size	- 0.183 ^{NS}		
	➤ Farm size	- 0.210 ^{NS}		
	➤ Annual family income	- 0.142 ^{NS}		
	➤ Maize cultivation area	- 0.237*		
	➤ Training exposure on maize cultivation	- 0.246*		
	➤ Extension media contact	- 0.296**		
	➤ Cosmopolitaness	- 0.263*		
	➤ Knowledge on maize cultivation	- 0.375**		

^{NS} Not 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 problem faced in maize cultivation

Relationship between age of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: “There is no relationship between age of the farmers and their problem faced in maize cultivation”.

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.070 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a) *The computed value of 'r' ($r = -0.070$) was found to be smaller than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b) *The null hypothesis could not be rejected.*
- c) *The relationship between the concerned variables was not significant.*

Based on the above findings, the researcher concluded that age of the farmers had no significant relationship with their problem faced in maize cultivation. This meant that age of the farmers was not an important factor in problem faced in maize cultivation.

4.3.2 Relationship between level of education of the farmers and their problem faced in maize cultivation

Relationship between education of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: "There is no relationship between level of education of the farmers and their problem faced in maize cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.083 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a) *The computed value of 'r' ($r = -0.083$) was found to be smaller than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.01 level of probability.*
- b) *The null hypothesis could not be rejected.*
- c) *The relationship between the concerned variables was not significant.*

Based on the above findings, the researcher concluded that level of education of the farmers had no significant relationship with their problem faced in maize cultivation. This indicated that education of the maize farmers in adoption of maize cultivation technologies was not an important factor for their problem faced in maize cultivation.

4.3.3 Relationship between family size of the farmers and their problem faced in maize cultivation

Relationship between family size of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: “There is no relationship between family size of the farmers and their problem faced in maize cultivation”.

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.183 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a) *The computed value of ‘r’ ($r = - 0.183$) was found to be smaller than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b) *The null hypothesis could not be rejected.*
- c) *The relationship between the concerned variables was not significant.*

Based on the above findings, the researcher concluded that family size of the farmers had no significant relationship with their problem faced in maize cultivation. This indicated that family size of the farmers was not an important factor for their problem faced in maize cultivation.

4.3.4 Relationship between farm size of the farmers and their problem faced in maize cultivation

Relationship between farm size of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: “There is no relationship between farm size of the farmers and their problem faced in maize cultivation”.

The calculated value of the co-efficient of correlation between the concerned variable was found to be -0.210 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a) The computed value of 'r' ($r = -0.210$) was found to be smaller than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b) The null hypothesis could not be rejected.*
- c) The relationship between the concerned variables was not significant.*

Based on the above findings, the researcher concluded that farm size of the farmers had no significant relationship with their problem faced in maize cultivation. This indicated that farm size of the farmers was not an important factor for their problem faced in maize cultivation.

4.3.5 Relationship between annual family income of the farmers and their problem faced in maize cultivation

Relationship between annual family income of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: “There is no relationship between annual family income of the farmer and their problem faced in maize cultivation”.

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.142 as shown in Table 4.13. The following

observations were made regarding the relationship between the two variables under consideration.

- a. *The computed value of 'r' ($r = -0.210$) was found to be smaller than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b. *The null hypothesis could not be rejected.*
- c. *The relationship between the concerned variables was not significant.*

Based on the above findings, the researcher concluded that annual family income of the farmers had no relationship with their problem faced in maize cultivation. This indicated that annual family income of the farmers was not an important factor for their problem faced in maize cultivation.

4.3.6 Relationship between maize cultivation area of the farmers and their problem faced in maize cultivation

Relationship between maize cultivation area of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: "There is no relationship between maize cultivation area of the farmer and their problem faced in maize cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.237 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a) *The computed value of 'r' ($r = -0.237$) was found to be larger than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b) *The null hypothesis was rejected.*
- c) *The relationship between the concerned variables was significant.*
- d) *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that annual family income of the farmers had negative and significant relationship with their problem faced in maize cultivation.

4.3.7 Relationship between training exposure on maize cultivation of the farmers and their problem faced in maize cultivation

Relationship between training exposure on maize cultivation of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: “There is no relationship between training exposure on maize cultivation of the farmer and their problem faced in maize cultivation”.

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.246 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a) The computed value of ‘r’ ($r = -0.246$) was found to be larger than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b) The null hypothesis was rejected.*
- c) The relationship between the concerned variables was significant.*
- d) The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that training exposure on maize cultivation of the farmers had negative and significant relationship with their problem faced in maize cultivation. This implies that farmers with higher training exposure on maize cultivation were likely to have lower level of problem faced in maize cultivation. Training provides the structures, techniques and awareness to manage time and work load efficiently, which increases productivity and motivates farmer more to achieve more. Training

received develops the farmers' knowledge, skill, and attitude in positive manner. The farmer who has no training cannot gain enough knowledge, skill and practical experience. Such consideration indicates the need for improving knowledge and skill level of the farmers by supplying enough training on maize cultivation in order to reduce problem in maize cultivation.

4.3.8 Relationship between extension media contact of the farmers and their problem faced in maize cultivation

Relationship between extension media contact of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: "There is no relationship between extension media contact of the farmer and their problem faced in maize cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.296 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a. The computed value of 'r' ($r = -0.296$) was found to be larger than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b. The null hypothesis was rejected.*
- c. The relationship between the concerned variables was significant.*
- d. The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that extension media contact of the farmers had negative and significant relationship with their problem faced in maize cultivation. This implies that farmers with higher extension media contact were likely to have lower level of problem faced in maize cultivation.

4.3.9 Relationship between cosmopolitanism of the farmers and their problem faced in maize cultivation

Relationship between cosmopolitanism of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: “There is no relationship between cosmopolitanism of the farmer and their problem faced in maize cultivation”.

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.263 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a. The computed value of 'r' ($r = -0.263$) was found to be larger than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b. The null hypothesis was rejected.*
- c. The relationship between the concerned variables was significant.*
- d. The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that cosmopolitanism of the farmers had negative and significant relationship with their problem faced in maize cultivation. This implies that farmers with higher extension media contact were likely to have lower level of problem faced in maize cultivation. This implies that farmers having higher cosmopolitanism were likely to have lower level of problem faced in maize cultivation.

4.3.10 Relationship between knowledge on maize cultivation of the farmers and their problem faced in maize cultivation

Relationship between knowledge on maize cultivation of the farmers and their problem faced in maize cultivation was determined by testing the following null hypothesis: “There is no relationship between knowledge on

maize cultivation of the farmer and their problem faced in maize cultivation”.

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.375 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- a. *The computed value of 'r' ($r = -0.375$) was found to be larger than the tabulated value ($r = 0.217$) with 80 degrees of freedom at 0.05 level of probability.*
- b. *The null hypothesis was rejected.*
- c. *The relationship between the concerned variables was significant.*
- d. *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that knowledge on maize cultivation of the farmers had negative and significant relationship with their problem faced in maize cultivation. This implies that farmers with higher knowledge on maize cultivation were likely to have lower level of problem faced in maize cultivation. This implies that farmers having higher knowledge on maize cultivation were likely to have lower level of problem faced in maize cultivation.

4.4 Comparison among different problems faced by the maize farmers

The observed problem faced index in maize cultivation ranged from 101 to 212 against the possible range of 0 to 246. The formula for determining PFI has been shown in chapter 3. The selected 16 problems faced by the respondents which were arranged in rank order according to their descending order of problem faced index (PFI) as shown in Table 4.147.

Table 4.14 Rank order of nine selected problems faced by the farmers in maize cultivation

N=82

Problems	Extent of Problem faced				PFI	Rank Order
	High problem (3)	Medium problem (2)	Low problem (1)	No problem (0)		
Low market price of maize	62	10	6	4	212	1
Lack of quality seeds	58	15	5	4	209	2
Lack of training on maize cultivation	50	19	10	3	198	3
High price of fertilizer	48	10	15	9	179	4
Lack of knowledge on using balanced fertilizers for maize cultivation	49	8	14	11	177	5
High Price of maize seed	46	8	12	16	166	6
Non-availability of credit in time	44	9	13	16	163	7
Less irrigation facilities	40	13	10	19	156	8
Lack of marketing facilities	35	15	17	15	152	9
Lack of storage facilities	40	10	10	22	150	10
Lack of proper knowledge in seed storage at farmers' level	35	13	12	22	143	11
High cost of irrigation	30	16	15	21	137	12
Transport problem	27	20	10	25	131	13
Water logging condition	26	15	15	26	123	14
Lack of advice in proper time	20	13	20	29	106	15
Unavailability of pesticides in time	18	16	15	33	101	16

PFI = Problem Faced Index

N = 82

On the basis of PFI, it was observed that ‘Lower market price of maize’ ranked first followed by ‘Lack of quality seeds’, ‘Lack of training on maize cultivation’, ‘High price of fertilizer’, ‘Lack of knowledge on using balanced fertilizers for maize cultivation’, ‘High Price of maize seed’, ‘Non-

availability of credit in time', 'Less irrigation facilities', 'Lack of marketing facilities', 'Lack of storage facilities', 'Lack of proper knowledge in seed storage at farmers' level', 'High cost of irrigation', 'Transport problem', 'Water logging condition', 'Lack of advice in proper time' and 'Unavailability of pesticides in time'.

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter presents summary of findings, conclusions and recommendations of the study.

5.1 Summary of findings

The major findings of the study are summarized below:

5.1.1 Individual characteristics of the farmers

Findings in respect of the 10 selected characteristics of the farmers are summarized below:

Age: Slightly above three fourth (75.60 percent) of the farmers was young to middle aged, while 24.40 percent were old aged.

Level of Education: The highest proportion (53.70%) of the farmers was in the illiterate level. Primary, secondary and above secondary level of literacy were found to be 9.80 percent, 28 percent and 8.5 percent respectively.

Family Size: About three fifth (59.80 percent) of the farmers had medium family size, while 30.50 percent and 9.80 percent belonged to the small family size and large family size respectively.

Farm size: About three fourth (74.40%) of the farmers had small farm size and the rest 25.60 percent belonged to the medium farm size.

Annual family income: The highest proportion (68.30%) of the respondent farmers had low annual family income compared with 25.60 percent having medium income and 6.10 percent having high annual family income.

Maize cultivation area: The highest proportion (57.30%) of the respondents had medium farm area, while 24.40 percent and 18.30 percent belonged to the small area and large area respectively.

Training exposure on maize cultivation: The highest proportion (53.70%) of the respondents had low training exposure compared to 37.80 percent, 8.30 percent and 2.40 percent having no training, medium training and high training respectively. It means, overwhelming majority (93.50%) of the maize growers had no to low training on maize cultivation.

Extension media contact: The highest proportion (56.10%) of the farmers had low extension media contact as compared to 36.60 percent having medium extension medium contact and 7.30 percent having high extension contact. It means, overwhelming majority (92.70%) of the maize growers had low to medium extension media contact.

Cosmopolitaness: The highest proportion (62.20%) of the farmers had medium cosmopolitaness as compared to 19.50 percent having low cosmopolitaness and 18.30 percent having high cosmopolitaness.

Knowledge on maize cultivation: More than three fourth (75.60 %) of the respondents fell in medium knowledge category followed by 18.30 percent in high knowledge category and only 6.10 percent in low knowledge category.

5.1.2 Problem faced by the farmers in maize cultivation

The observed overall problem faced score of the farmers in maize cultivation ranged from 18 to 41 against the possible range of 0 to 48 scores. The mean score was 30.59 and the standard deviation 4.78. Majority (78%) of the respondents faced medium problem in maize production activities and 17.10 percent faced high problems and 4.90 percent faced low problems. Findings

again reveal that a very large proportions (95.10%) of the farmers faced medium to high problems in maize production.

5.1.3 Relationship between selected characteristics and problem faced:

Maize cultivation area, training exposure on maize cultivation, extension media contact, cosmopolitaness and knowledge on maize cultivation had significant negative relationships with the problem faced by the farmers in maize cultivation. Age, level of education, family size, farm size and annual family income had had no significant relationship with the problems faced by the farmers in maize cultivation.

5.1.4 Comparative Problem Facing of Selected Items of Maize Cultivation

In order to compare the problem faced by the farmers in 16 selected items of maize production, a Problem Faced Index (PFI) was computed for each item. Farmers faced highest problems in ‘Lower market price of maize’ which ranked first followed by ‘Lack of quality seeds’, ‘Lack of training on maize cultivation’. ‘Unavailability of pesticides in time’ was the least problem faced by the farmers.

5.2 Conclusions

“A conclusion presents the statements based on major findings of the study and these statements mostly confirm to the objectives of the research in the shortest form. It presents the direct answers of the research objectives, or it relates to the hypothesis” (Labon and Schefter, 1990).

Findings of the present study and the logical interpretation of other relevant facts prompted the researcher to draw the following conclusions:

1. A very great majority (95.10%) of the farmers faced medium to high problems in maize production. From this fact, it may be concluded that

until the maize farmers are free from different problems in maize cultivation, they will not be able to produce more maize in their field.

2. Majority (81.70%) of the farmers had medium to small maize cultivation area, while there was a negatively significant relationship between maize cultivation area and their problem faced. Thus, it may be concluded that small and medium maize farmers face more problem than large maize farmers.
3. An over-whelming majority (91.50%) of the farmers had no to low training exposure on maize cultivation, while there was a negative significant relationship between training exposure on maize cultivation and their problem faced. Therefore, it may be concluded that majority of the maize farmers more likely to face problems unless steps are taken to supply proper training on maize cultivation.
4. An over-whelming majority (92.70%) of the farmers had low to medium extension media contact, while there was a negatively significant relationship between extension media contact of the farmers and their problem faced. Therefore, it may be concluded that a very large majority of the farmers will continue to face problems, if suitable steps are not taken to strengthen extension activities among the farmers.
5. A great majority (81.70%) of the farmers had medium to low cosmopolitaness, while there existed a negative significant relationship between farmers' cosmopolitaness and their problem faced. The above facts lead to the conclusion that more cosmopolitaness of the farmers will be highly helpful for minimizing their problem in maize cultivation.

6. More than three fourth (75.60 %) of the respondents of the respondents fell in medium knowledge category, while there exists a very strong negative significant relationship between maize cultivation knowledge of the farmers and their problem faced. One would, therefore, conclude that an effort to improve maize cultivation knowledge of the farmers would be helpful for minimizing their problem in maize cultivation.
7. Farmers faced highest problems in 'Lower market price of maize' which ranked first followed by 'Lack of quality seeds', 'Lack of training on maize cultivation' and 'high price of fertilizer'. Therefore, it may be concluded that emphasis should be taken to minimize these problems.

5.3 Recommendation

5.3.1 Recommendations for policy implications

On the basis of experience, observation and conclusions drawn from the findings of the study, the following recommendations were made:

1. Near about all (95.10%) of the farmers faced medium to high problems in maize production. In view of the urgent need for increasing maize production, it is recommended that steps should be taken on a priority basis to remove the various problems causing hindrance to the maize cultivation, harvesting, storage and marketing.
2. Majority (81.70%) of the farmers had medium to small maize cultivation area, while there was a negatively significant relationship between maize cultivation area and their problem faced. Therefore, it may be recommended that attempts should be taken to provide technical support and subsidy, especially for the small and medium maize cultivating farmers.

3. An over-whelming majority (91.50%) of the farmers had no to low training exposure on maize cultivation, while there was a negatively significant relationship between training exposure on maize cultivation and their problem faced. Therefore it may be recommended that attempts should be taken for maize growers to arrange necessary training on maize cultivation by providing detail maize cultivation guide.
4. An over-whelming majority (92.70%) of the farmers had low to medium extension media contact, while there was a negative significant relationship between extension media contact of the farmers and their problem faced. So extension contact is necessary for reducing problems in maize cultivation. It is, therefore, recommended that extension personnel should take appropriate and suitable steps so that the maize farmers can come in contact with different media.
5. A great majority (81.70%) of the farmers had medium to low cosmopolitaness, while there existed a negative significant relationship between farmers' cosmopolitaness and their problem faced. The importance of cosmopolitaness on the part of the farmers leads to the following recommendations:
 - (a) Extension workers should identify the cosmopolite farmers and utilize them in extension programs for encouraging adoption of improved maize cultivation technologies.
 - (b) There should be arrangement for tour of the farmers for visiting agricultural research stations, agricultural farms, agricultural universities and other agriculture related organizations. It will help them acquire knowledge, skill and attitude to cope more effectively with their problem in maize cultivation.

6. More than three fourth (75.60 %) of the respondents of the respondents fell in medium knowledge category, while there exists a very strong negative significant relationship between maize cultivation knowledge of the farmers and their problem faced. Therefore it may be recommended that attempts should be taken by the Department of Agricultural Extension (DAE) and other extension providers to arrange training, motivational campaigning and provide maize cultivation guide for increasing maize cultivation knowledge of the maize farmers.
7. Farmers faced higher problems in ‘Lower market price of maize’ followed by ‘Lack of quality seeds’, ‘Lack of training on maize cultivation’ and High price of fertilizer. Therefore, it may be recommended that necessary technical support should be provided for the maize growers to minimize their problems with special emphasis to these problems.

5.3.2 Recommendations for further study

A small and limited research work cannot provide unique and universal information related to actual impact of improving socio-economic status of the farmers. Further studies should be undertaken on related matters. On the basis of scope and limitations of the present study and observations made by the researcher, the following recommendations are made for further study:

- i. The study was conducted in Manikganj Sadar Upazila under Manikganj District. Similar studies should be conducted in other parts of the country to get a clear picture of the whole country which will be helpful for effective policy formulation.
- ii. It is difficult to explore all the problems faced by the farmers in maize cultivation. Measurement of problems of the farmers is not free from

questions. More reliable measurement of the concerned variable is necessary for further study.

- iii. The present study was undertaken to explore relationships of ten selected characteristics of the farmers with their problem faced in maize cultivation. Therefore, it could be recommended that further studies should be designed considering other agricultural and non-agricultural activities and other characteristics of the farmers that might affect problem faced in maize cultivation.
- iv. In the present study age, level of education, family size, farm size and annual family income had no significant relationship with their problem faced in maize cultivation. In this connection, further verification is necessary.
- v. Research should be undertaken on the effectiveness of agricultural extension services and other related organizations in helping people to solve their maize cultivation problems.

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Appendix-A

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

An interview schedule for a research study entitled

“Problem Faced By the Farmers in Maize Cultivation”

Serial No.....

Respondent Name:

Village:

Union:

Upazilla:

Please provide information on the following aspects:

1. Age:

What is your present age? Years

2. Education:

What is the level of your education?

- a) Illiterate.....
- b) Can sign only
- c) I studied up to class
- d) I passed examination

3. Please mention the number of your family member:

.....members (including yourself)

4. Farm size (Please mention your farm size):

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

5. Maize cultivation area: Mention the area you have used for maize cultivation?

.....acre/ bigha/ pakhi hectares

6. Training Exposure: Have you participated any training program on maize cultivation? Yes...../No.....If yes, furnishes the following information:

Sl. No.	Name of training course	Organization	Day (s)
1			
2			
3			

7. Knowledge on Maize Cultivation: Please answer the following questions

Sl. No.	Questions	Full Marks	Marks obtained
1.	Which type of land is suitable for maize cultivation?	2	
2.	Mention two modern maize varieties?	2	
3.	What is the proper sowing time of maize seed?	2	
4.	What is the proper sowing method of modern maize varieties?	2	
5.	What is the seed rate kg/ha for modern maize cultivation?	2	
6.	What is the number of seed per hill for sowing of maize?	2	
7.	Which is the ideal plant spacing for modern maize cultivation?	2	

8.	After how many days of sowing you should complete gap filling or thinning out?	2	
9.	Mention the rate of fertilizer per ha is needed in maize cultivation?	2	
10.	What is the importance of applying balance fertilizer in maize?	2	
11.	Mention how many times irrigation is necessary for cultivating maize in rabi season?	2	
12.	After how many days of sowing the first irrigation is required?	2	
13.	Mention the benefit of line sowing over broadcasting?	2	
14.	Mention two diseases of maize?	2	
15.	Mention the name of a pesticide for maize seed treatment?	2	
16.	Mention the symptom of leaf blight diseases of maize?	2	
17.	How do you control cutworm in maize field?	2	
18.	Mention two important crops that can be used in intercropping with maize?	2	
19.	What is the suitable time of harvesting maize cob?	2	
20.	What is the best method for seed storing?	2	
21.	How can you test optimum moisture content for maize seed storage?	2	
	Total	42	

8. Annual Family income: Please state the income of your family during last one year:

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

9. Extension media contact: Please indicate the extent of contact with the following communication media:

Sl. No.	Name of information sources	Extent of contact			
		Frequently (3)	Occasionally (2)	Rarely (1)	Not at all (0)
1.	Model farmers	4 or more times/month	2-3 times/month	At least once a month	
2.	Input dealers	3 or more times/month	1-2 times/month	At least once a month	
3.	NGO workers	3 or more times/month	1-2 times/month	At least once a month	
4.	Sub Assistant Agricultural Officer (SAAO)	4 or more times/month	2-3 times/month	1 time/months	
5.	Scientific officer of BARI	4 or more times/Year	2-3 times/year	1time/year	
6.	Participation in group meeting	3 or more times/month	1-2 times/month	At least once a month	
7.	Listening agricultural program on radio	4-7 days/week	1-3 days/week	1-3 days/month	
8.	Watching agricultural program on TV	4-7 days/week	1-3 days/week	1-3 days/month	
9.	Reading printed materials like leaflet, bulletin	>5 times/month	3-5 times/month	1-2 times/month	

10. Cosmopolitenes: Please mention the extent of visit in specific place for a specific period

Sl. No.	Place of visit	Extent of contact			
		Frequently (3)	Occasionally (2)	Rarely (1)	Not at all (0)
1.	Other village	6 or more times/month	4-5 time/month	1-3 month	Not even once a month
2.	Local Market	6 or more times/month	4-5 times/month	1-3 month	Not even once a month
3.	Own Union Parishad	5 or more times/month	3-4 times/month	1-2 times/month	Not even once a month
4.	Own Upazilla Headquarter	5 or more times/month	3-4 times/month	1-2 times/month	Not even once a month
5.	Other Upazilla(s)	3 or more times/month	3-4 times/month	1-2 times/month	Not even per three months
6.	Own district town	5-6 or more times/ six month	3-4 times/ six month	1-2 times/ six month	Not even per six months
7.	Other district (s)	4 or more times/year	2-3 times/year	one time/year	Not even once a year
8.	Capital (per year)	3 or more times in a year	2 times in a year	Once a year	Not even once a year

11. Credit received:

Did you receive any credit from any sources? -----Yes / No

If yes, please mention the sources of receiving credit and the amount of credit received.

Sl. No.	Sources of credit	Amount of credit (Tk.)
1	NGOs	
2	Banks	
3	Money lenders	
4	Friends	
5	Neighbors	
6	Relatives	
7	Others	

12. Problems: Please mention the extent of problem you faced in maize cultivation

Sl. No.	Problems	Extent of Problem			
		High	Medium	Low	Not at all
1.	Lack of quality seeds				
2.	High Price of maize seed				
3.	High price of fertilizer				
4.	Non-availability of credit in time				
5.	Lack of training on maize cultivation				
6.	Lack of marketing facilities				
7.	Less irrigation facilities				
8.	Lack of advice in proper time				
9.	Unavailability of pesticides in time				
10.	Low market price of maize				
11.	High cost of irrigation				
12.	Lack of storage facilities				
13.	Lack of knowledge on using balanced fertilizers for maize cultivation				
14.	Water logging condition				
15.	Lack of proper knowledge in seed storage at farmers' level				
16.	Transport problem				

Thanks for your co-operation,

Date.....

Signature of the interviewer

Appendix-B

Correlation Matrix

Characters	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Y
X1	-										
X2	-0.329**	-									
X3	0.346**	-0.209	-								
X4	0.196	-0.038	-0.070	-							
X5	-0.041	0.180	0.325**	0.080	-						
X6	0.175	-0.158	0.045	0.683**	0.002	-					
X7	-0.107	0.021	0.322**	-0.114	0.582**	0.031	-				
X8	-0.190	0.376**	0.134	-0.077	0.743**	-0.078	0.676**	-			
X9	-0.279*	0.409**	0.057	-0.062	0.566**	-0.005	0.417**	0.743**	-		
X10	-0.126	0.178	0.126	-0.106	0.584**	0.023	0.511**	0.728**	0.517*	-	
Y	0-.070	-0.083	-0.183	-0.210	-0.205	-0.237*	-0.246*	-0.296**	-0.263*	-0.375**	-

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

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

X1: Age

X4: Farm Size

X7: Training on Vegetable Cultivation

X10: Knowledge on maize cultivation

Y: Problems faced in maize cultivation

X2: Level of Education

X5: Annual family income

X8: Extension media contact

X3: Family Size

X6: Vegetable Cultivation Area

X9: Cosmopolitans