ADOPTION OF BRINJAL PRODUCTION TECHNOLOGIES BY THE FARMERS OF TWO SELECTED VILLAGES OF ISLAMPUR UPAZILA IN JAMALPUR DISTRICT

A Thesis

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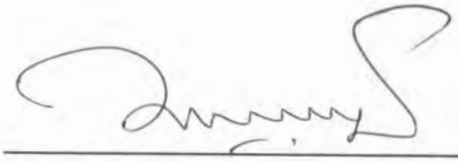

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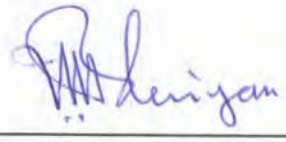

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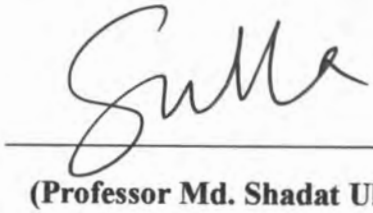

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CERTIFICATE

This is to certify that the thesis entitled, **"ADOPTION OF BRINJAL PRODUCTION TECHNOLOGIES BY THE FARMERS OF TWO SELECTED VILLAGES OF ISLAMPUR UPOZILA IN JAMALPUR DISTRICT "** submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfilment of the requirements for the degree of **MASTER OF SCIENCE** in **AGRICULTURAL EXTENSION AND INFORMATION SYSTEM,** embodies the result of a piece of bonafide research work carried out by **Md Sameul Islam** Registration No. **00555** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

Dated:
Place: Dhaka, Bangladesh

.....
(Assoc. Prof. Md. Rafiquel Islam)
Supervisor

Dedicated to
My
Beloved Parents who laid the foundation of my success

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The author

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ABSTRACT

The main purpose of the study was to determine the extent of adoption of brinjal production technologies by the farmers. Attempts were made to explore the relationships between the selected characteristics of farmers and adoption of selected technologies. Data were obtained from 100 randomly selected farmers from a total of 507 in Shampur union under Islampur upazila of Jamalpur district during 10 February to 10 March 2006 with the help of an interview schedule. Appropriate scales were developed in order to measure the variables. Correlation test was used to ascertain the relationships between the concerned variables of the study. The findings revealed that, majority (69 percent) of the farmers had medium adoption while 17 percent had low adoption and 14 percent had high adoption of selected brinjal production technologies. Correlation analysis indicate that among the selected characteristics of the farmers, education, family size, farm size, annual family income, farming experience, extension contact, training exposure and organizational participation showed significant positive relationships with the adoption of brinjal production technologies. On the other hand age and cosmopoliteness of farmers did not show any significant relationships with their adoption of brinjal production technologies. More than two thirds i.e 67 percent of the brinjal growers faced medium problems, 15 percent faced low and 18 percent faced high problems. The top of the 5 major problems in order of importance were: (1) scarcity of quality variety of seed / seedling, fertilizer and pesticide (2) Marketing problem (3) High input cost (4) Lack of cash money and (5) storage facility.

CHAPTER I

INTRODUCTION

1.1 Background of the study

Bangladesh is basically an agricultural country. It is one of the most populous countries of the world. About 77% of the total population of this country lives in the rural areas. And the living of this vast population is mostly dependent on agriculture. The development of agriculture is mostly dependent on the use of modern technologies by the farmers. The future of the farmers and that of Bangladesh is influenced by the extent to which the farmers use more modern technologies which are locally applicable under the changing circumstances.

Agriculture production can only be increased if appropriate technologies are used by the farmers who are the primary unit of adoption of improved practices. Diffusion of proper knowledge on modern agriculture among the rural people demands effective communication system. In addition, immediacy and effectiveness is also valuable dimension for communication of technological messages. This suggests that the flow of information should be as fast as possible and also should be understandable, well interpreted, accepted and liked by users.

Bangladesh produces different kind of vegetables. Brinjal or eggplant is one of the most common popular, and principal vegetable crops grown in Bangladesh and other parts of the world. A numbers of cultivars are grown throughout the country depending upon the yield, consumer's preference about he colour, size, and shape of the various cultivars. It is highly productive.

Brinjal is the most important vegetable of the country. The annual production is 3.26 million tons including potato and sweet potato (Anon, 2000 a). Brinjal (*Solanum melongena*), Linnaeus belongs of the family Solanaceae (Thompson, 1951) is also known as eggplant or aubergine is a popular nutritious and grown vegetable in Bangladesh as well as in the world and has got multifarious use as a dish item. It is thought to be originated in Indian subcontinent because of maximum of genetic diversity and closely related species of solanum are grown in this reason (Rashid, 1976; Zeven and Zhukovsky, 1975).

Brinjal is an annual in temperate zones and perennial in the tropics plant grow to a height of 60 to 120 cm. (2-4 ft) and bears of a few large fruits which are oval shaped or an elongated oval. A warm season crops of brinjal requires continuous long warm weather during growth and Fruit maturation .The optimum growing temperature is 22-30°C (72°-86°F) and growth stop at temperature below 17°C (63°F).

Brinjal is the second most important vegetable crop next to potato in respect of total average (62,753 ha.) and production (3,70,000 mt. annually) in Bangladesh (BBS, 2003). It is equally preferred by both rich and poor people. Brinjal are extensively cultivated in Bangladesh and is grown in homestead area and commercial field in the both winter and rainy seasons. It is grown round the year in any space available for crop cultivation. Therefore it is available in the country throughout the year especially during the lean period when the seasonal vegetables are in a scarcity in the market. Brinjal is regarded as a cash crop to the farmers which provides them continuous harvesting and financial assistance. Total production of brinjal has been estimated 382, 378 and 370, thousand MT. in 2000-2001, 2001-2002 and 2002-2003 respectively (BBS, 2004).

1.2 Justification of the study

Brinjal is one of the most important vegetable of the country. Production of brinjal may be increased by using of modern technologies properly. In Bangladesh, the production of brinjal was 370 thousand. m.ton. during 2002-2003 (BBS 2004). The concept and benefits of the modern technologies should be disseminated to the farmers in a convincing and attractive manner, so that farmers response quickly to adopt those technologies. This is undoubtedly an educative process and it possible through Extension Education System, concerned mainly with increasing agricultural production and improving living standards of the farmers. Brinjal is the second most important crops of Bangladesh after potato. Some famous varieties are cultivated in Jamalpur district which profitability is higher than other vegetables crops. Jamalpur district is considered as brinjal surplus production zone of the country. Therefore, the Jamalpur district is considered as the most suitable location to study the phenomenon of adoption of brinjal production technologies by the brinjal growers.

On an average about 2.4 to 2.8 million hectares of land remain uncultivated during in winter season. A substantial portion of that, brinjal production need less water, faces less problem due to weed and insect. Now considerable effort is being made through research and extension delivery system to increase brinjal production in our country. But the actual increase in production will depend on the activities of the brinjal growers. The behavior of a farmer is influenced by his personal, economic, social and physiological characteristics (Hossain, 1991).

1.3 Statement of the Problem

When an innovation is introduced to the farmer, it may be readily accepted, partly accepted, completely or partly rejected or sometimes, it may so happen that the adoption of innovation is discontinued or totally stopped. These happening are certainly due to a number of factors. Adoption of brinjal

production technologies are influenced by the farmers demographic and socio economic position. An understanding about the same will be useful to the researchers, planners and extension workers in doing research, planning and execution of extension programs for enhancing adoption of brinjal production technologies. The purpose of this study therefore, was to explore the relationships between different characteristics of the farmers and their adoption of brinjal production technologies. To expand the cultivation of this vegetable crop in other parts of the country, the knowledge on the present situation of brinjal production technologies in this region will be significantly contributory to design appropriate programs for its widespread cultivation. In these respects, the answers to the following questions will be very much pertinent.

1. To what extent of brinjal production technologies has been adopted by the brinjal growers?
2. What are the characteristics of brinjal growers?
3. What are the relationships of the adoption of brinjal production technologies with some selected characteristics of the brinjal growers?
4. How and to what extent of socio-economic conditions influenced them in adopting brinjal production technologies?
5. What problems are faced by the farmers for adoption of brinjal production technologies?

These questions obviously indicate the need for conducting a research study entitled "Adoption of brinjal production technologies by the farmers in two selected villages of Islampur upazilla in Jamalpur district".

1.4 Specific Objectives of the Study

The following objectives were formulated to give clear direction to the study:

1. To determine and describe the selected characteristics of the farmers. The selected characteristics are
    a. Age
    b. Education
    c. Family size
    d. Farm size
    e. Annual family income
    f. Farming experience
    g. Extension contact.
    h. Training exposure
    i. Organizational participation
    j. Cosmopoliteness

2. To determine and describe the extent of adoption of brinjal production technologies by the farmers.
3. To explore the relationship between the selected characteristics of the farmers and their adoption of brinjal production technologies.
4 To describe the extent of problem faced by the farmers in adopting brinjal production technologies.

1.5 Scope of the Study

The main focus of the study was to determine adoption of brinjal production technologies. The findings of the study will be specifically applicable to Shampur union under Islampur Upazila of Jamalpur district. However, the findings will also have implications for other areas of the country having relevance to the socio-cultural context of the study area. The investigator believes that the findings of the study will reveal the phenomenon related to diffusion of innovation. These will be of special interest to the policy makers

and planners in formulating and redesigning the extension programs especially for brinjal production. The findings are expected to be helpful to the field workers of different nation building department and organizations to develop appropriate extension strategies for effective working with the rural people.

1.6 Limitation of the Study

Considering the time, money and other necessary resources available to make the study manageable and meaningful, it was necessary to consider the following limitations:

1. The study was confined in two villages of Shampur union under Islampur upazila of Jamalpur district.
2. Ten characteristics of brinjal growers were selected for investigation.
3. Population of the study includes only the heads of the farm families.
4. The study was confined with the adoption of brinjal production technologies of two years.
5. The investigator dependent on the data furnished by the selected farmers during their interviews.
6. Facts and figures collected by the investigator applied to the situation prevailing during the year 2005.

1.7 Assumption of the Study

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

1. The respondent included in the sample was capable of providing proper answer to the question in the interview schedule.
2. The researcher who acted as interviewer was adjusted to social and environmental condition of the study area. Hence the data collected by him and the respondents were free from bias.

3. Views and opinions furnished by farmers included in the sample were representative views and opinion of the whole population of the study.
4. The responses furnished by the respondents were reliable i.e. they expressed the truth about their conviction and opinions.
5. The respondents were more or less conscious about the use of brinjal production technologies
6. The finding of the study will have general application to other parts of the country with similar, socio-economic, cultural and agro-ecological conditions of the study area.

1.8 Statement of Hypothesis

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

The following hypothesis is formulated to explore the relationship between the dependent and independent variables. The major research hypothesis for the study is: "there is relationship between farmer's adoption of brinjal production technologies and their selected characteristics".

The research hypothesis was converted into null form for the purpose of statistical testing. The major null hypotheses state that "There is no relationship between farmer's adoption of brinjal production technologies and their selected characteristics". Ten null hypotheses were formulated dealing with each of the selected characteristics.

1.9 Definition of key terms

A concept is an abstract of observed thing, events or phenomenon or in other words, it is a short hand representation of variety of facts (Wilkinson and Bhandarkar, 1977). A researcher needs to know the meaning and contents of every term that he uses. 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 defined are interpreted as follows:

Adoption: It is the implementation of a decision to continue the use of an innovation. According to Rogers (1995) "Adoption is a decision to make full use of an innovation as the best course of action available." When an individual takes up a new idea as the best course of action and practices it the phenomenon is known as adoption (Ray, 1991). In this study, adoption was defined as the phenomenon of taking up a new idea related to brinjal production and put it into practices by the brinjal growers of Islampur upazilla.

Farmers/Growers: The persons who were involved in farming activities are called farmers. They participated in different farm and community level activities like crops, livestock, fisheries, other farming activities etc.

Age: It means the age of a farmer that will refers to the period of time from his birth to the time of investigation.

Education: Education of an individual farmer was defined as the formal education received up to a certain level from an educational institute. (e.g School, College and University)

Family size: Family size refers to the total number of members including the respondent himself, spouse, children and other dependent, who live and eat together in a family unit.

Farm size: Farm size refers to the total area on which a farmers family carries on farming operations, the area being estimated in terms of full benefit to the farmer's family.

Annual income: It means the total earning by the respondents himself and the members of his family from agriculture and other sources during a year. It is expressed in taka.

Training exposure: It refers to the total number of days attended by the farmers in his life to the various agricultural subject matter. Respondent received short/long term training in his entire life up to the date of interviewing as provided by different organizations is considered for this variable.

Extension contact: It is referred to the respondents becoming accessible to the influence of different information media through different extension teaching methods.

Farming experience: Farming experience of a farmer is defined on the basis of his involvement in farming activities. It is expressed in year.

Organizational participation: Organizational participation of an individual refers to his participation in various or executive officer within a specified period of time.

Cosmopoliteness: It refers to the degree of which an individual's orientation is external to his own social system.

Respondents: People who have answered questions by an interviewer for a social survey. They are the people from whom a social research worker usually gets most data required for his research.

Problem faced: The term 'problem faced' refers to different problems faced by the farmers at the time of operating different activities.

Modern variety: Modern variety is those varieties which possess the quality for better performance in respect of yields, quality, and insect and disease resistance.

Extent of adoption: Ray (1991), defined extent of adoption as "The degree to which the farmer has actually adopted a practice".

Design of the study: It was designed to determine and describe the extent of adoption of brinjal production technologies by the farmers.

Overall adoption: It refers to the extent of adoption of overall selected technologies by a respondent.

Modern technologies: The term is used to those recommended practices by some competent authority through which better yield is achieved by various management and inputs. This term could be interchangeably with improved farm practices, selected farm practices, improved technologies etc.

Variable: A general indication in statistical research of characteristic that occurs in a number of individuals, objects, groups etc. and that can take on various values, for example the age of an individual.

Assumption: An assumption is "The supposition that an apparent fact or principle is true in the light of the available evidence" (Good, 1945).

Hypothesis: Defined by Goode and Hatt (1952), a proposition this can be put to "a test to determine its validity". It may be true or false, it may seem contrary to or in accord with common sense. However, it leads to an empirical test.

Null hypothesis: The hypothesis which we pick for statistical test is null hypothesis (Ho). In this study the null hypothesis is stated that there is no relationship between the concerned variables.

Statistical test: A body of rules which help to take decision regarding accepting or rejection of the hypothesis is defined as test. In this study if a null hypothesis is rejected it is assumed that there is a relationship between the variables.

CHAPTER II

REVIEW OF LITERATURE

The researcher made an elaborate search of available literature for the research. Available literature was intensively reviewed to find out work in Bangladesh. The purpose of this chapter is to review literatures having relevance to the study. This chapter is divided into four sections; The **first** section deals with past research findings relating to extent of adoption of innovation, the **second** section deals with the past research findings relating to the relationships of farmers' adoption of innovations with their selected characteristics, and the **third** section deals with the conceptual framework of the study.

2.1 Past Research Findings Relating to Extent of Adoption of Innovations

Karim and Mahboob (1986) conducted a study on the adoption of HYV wheat in Kushtia union of Mymensingh district. They observed that 74 percent of the farmers adopted HYV wheat to varying extent, while the remaining 26 percent were non adopters.

Hossain (1991) studied the extent of adoption behavior of contact wheat growers in sadar upazila of Jamalpur district. He found that more than half (52 percent) of the growers had medium adoption of improved farm practices compared to 34 percent having low adoption and only 14 percent high adoption.

Haque (1993) conducted an investigation on the adoption of improved practices of sugarcane cultivation in Sreepur upazila of Gazipur district. The study revealed that 31 Percent of the cane growers had high adoption while 37 percent had medium and 32 percent had low adoption of improved practices in sugarcane cultivation.

Muttaleb (1995) studied the extent of the adoption of improved technologies of potato cultivation by the farmers in Haibatpur union under sadar thana of Jossore district. The study revealed that 8 percent of the potato growers had high adoption of improved technologies, 43 percent has medium and 49 percent had low adoption.

Hasan (1996) found in his study that the highest proportion (44 percent) of the respondents perceived the existence of medium adoption, compared to 26 percent low adoption and 30 percent high adoption in respect of selected agricultural technologies.

Chowdhury (1997) conducted an investigation on adoption of selected BINA technologies by the farmers of Boyra union in Mymensingh district. The study revealed that the majority (58 percent) of the respondents had no adoption of BINA technologies and 42 percent were adopted BINA technologies.

Sarker (1997) studied the extent of adoption of improved potato cultivation practices by the farmers in Comilla district. The study revealed that more than half (55 percent) of the respondents had medium adoption compared to 23 percent having low adoption and 22 percent high adoption of improved potato cultivation practices.

Alam (1997) conducted an investigation on the adoption of HYV rice cultivation in Gazipur district. His study revealed that 40 percent had medium adoption, 32 percent had low and 28 percent had high adoption.

Ahaduzzaman (1999) conducted a study on the adoption of modern T. Aman technologies among the rice growers in sadar thana of Rangpur district. His study revealed that 51.81 percent had medium adoption, while 26.36 per cent had low and 21.81 percent had high adoption.

Rahman (1999) conducted investigation on adoption of balanced fertilizer by the farmers of Ishwargonj upazila in Mymensingh district. The study revealed that the majority (71 percent) of the respondents had medium adoption compared to 29 percent having below optimum adoption and there was no respondent at all who adopted the fertilizer at above optimum level.

Rahman (2001) conducted an investigation on knowledge, attitude and adoption of Aalok-6201 hybrid rice by the farmers of sadar upazila in Mymensingh district. The study revealed that the majority (75 percent) of the farmers had medium adoption while 18 percent and 7 percent had high and low adoption in Aalok-6201 hybrid rice cultivation respectively.

Hussen (2001) conducted an investigation on adoption of modern sugarcane cultivation practices by the farmers of Dewanganj upazila in Jamalpur district. The study revealed that about cent percent (91 percent) of the farmers had medium adoption compared to 7 percent having low adoption and only 2 percent having high adoption of modern sugarcane cultivation practices.

Sardar (2002) studied on "adopting of IPM practices by the farmers under PETRRA Project of RDRS". He observed that majority (45.9 percent) of the farmers had medium, 38.3 percent had low and 15.8 percent had high adoption of IPM practices.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. The study revealed that 69 percent of the farmers had medium adoption while 13 percent had low adoption and 18 percent had high adoption of modern agricultural technologies.

Aurangojeb (2002) studied on the extent of adoption of integrated farming technologies by the rural women in RDRS. He observed that the highest percent of rural women (64%) used high level, (28%) of the women used

medium level and only 8% used low level integrated homestead farming technologies.

Rahman (2003) revealed that about half (47 percent) of the growers had medium adoption 44 percent had low and 1 percent had high adoption of year round homestead fruit cultivation practices.

Hassain (2003) found that majority (67 percent) of the Boro rice farmers gad medium adoption, 17 percent had low adoption and 16 percent high adoption of modern Boro rice cultivation practices.

Hasan (2003) found that majority (67 percent) of the Boro rice farmers had medium adoption while 33 percent had low adoption and 7 percent gad high adoption of recommended potato cultivation practices.

Haque (2003) found that the majority (47 percent) of the growers had medium adoption of modern maize cultivation technologies while 28 percent had high adoption and 25 percent had low adoption.

Rahman (2003) found that ninety seven percent of the pineapple growers adopted 2-3 intercrops viz, Zinger, turmeric, sweet ground and aroid in pineapple cultivation.

Islam (2005) conducted a study on adoption of pashu pusti in cattle rearing at farmer's level. The study revealed that 71 percent of the farmers had medium adoption while 18 percent had high adoption and 11 percent had low adoption of pashu pusti in cattle rearing at farmer's level.

2.2 Past research findings relating to the relationship of farmers extent of adoption of innovations with their selected characteristics

This selection presents a review of previous studies relating the association of the selected characteristics of the farmers and their adoption of innovations. Ten characteristics of the farmers were selected as independent variables of this study. The researcher made outmost efforts to search out studies dealing with relationships of each of the selected characteristics with the adoption of technologies.

2.2.1 Age and adoption of innovation

Hossain (1991) conducted a study to determine the extent of adoption behavior of contract wheat growers in sadar upazila of Jamalpur district. He found negatively significant relationship between age of the farmers and their level of adoption of improved farm practices.

Singh (1991) conducted a study to determine the extent of adoption of selected recommended practices. He found no relationship between age of the farmers and their level of adoption of plant protection measures

Singh and Rajendra (1990) in their study on adoption of improved sugarcane variety found that age were to have positive association with the adoption of 767 variety of sugarcane.

Kashem *et al.* (1992) has conducted a study on the use of communication media in adopting agricultural technologies. They reported that age was significantly related to the adoption of rice cultivation.

Pathak *et al.* (1992) observed that there was positive and significant relationship between the age of the marginal farmers and their adoption of jute technologies. Similar finding was observed by Ali *et al.* (1986), Singh and Rajendra (1990), Okoro *et al* (1992) and Hossain *et al.* (1992).

2.2.2 Education and adoption of innovation

Hossain (1991) conducted a study to determine the extent of adoption behavior of contract wheat growers in sadar upazila of Jamalpur district. He found positively and moderate significant relationship between education of the farmers and their level of adoption of improved farm practices.

Muttaleb (1995) studied the relationship of education with adoption of improved practices, Most of the studies revealed similar findings, Haque (1993), Khan (1993) and Hossain *et al.* (1997) observed similar results.

Pal (1995) conducted a study on adoption of recommended sugarcane cultivation practices by the farmers. He found that education had significant and positive relationship with the adoption of recommended sugarcane cultivation practices. Most of the studies revealed similar findings. Haque (1993), Khan (1993) observed similar results.

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

Alam (1997) observed that the level of education of the farmer had a positive and significant relationship with the use of their improved farm practices.

Sarkar (1997) found that the level of education of the farmer had a positive significant relationship with their adoption of improved potato cultivation practices.

Hussen (2001) conducted a study on farmer's knowledge and adoption of modern sugarcane cultivation practices. He found that education of the growers

Haque (1993) has conducted a study to determine and describe the extent of adoption of BR 14 by the farmers. He found that negatively significant relationship between age of the farmers and their level of adoption of BR 14 during Boro season.

Islam (1993) observed that there was no relationship between the age of potato farmers and their adoption of improved practices in potato cultivation.

Haque (1993) observed that age had negative relationship with the adoption of improved practices in sugarcane cultivation.

Sarkar (1997) observed that there was no significant relationship between age of the farmers and their adoption of improved potato cultivation practices. Similar findings were observed by Karim and Mahaboob (1986) and Kher (1992) in their respective studies.

Aurangozeb (2002) observed that there was significant negative relationship between age and use of integrated homestead farming technologies. The interpretation is that with increased age level of the respondents there was a corresponding decrease of the adoption of homestead farming technologies.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that age of the respondents had negatively significant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

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

had a positive significant relationship with their adoption of modern sugarcane cultivation practices.

Aurangozeb (2002) observed that there was positive relationship between education and adoption of integrated homestead farming technologies. The educated women were more interested in adoption of integrated homestead farming technologies than the illiterate women.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that education of the farmers had a positive significant relationship with their adoption of modern agricultural technologies.

Sardar (2002) conducted a study on adoption of IPM practices by the farmers under PETRRA projects of RDRS. He found that education of the farmers had a positive significant relationship with their adoption of IPM practices.

2.2.3 Family size and adoption of innovation

Okoro and Obibuaka (1992) conducted a research in Nigeria on the adoption of recommended management practices in oil palm. He found that in his study family size had a significant positive relationship with the adoption of the recommended management practices.

Ali (1993) in his study found that family size of the respondents had no significant relationship with STP adoption behavior of sugarcane farmers.

Haque (1993) in his study found that family size of growers had a negative and significant relationship with their adoption of improved practices in sugarcane cultivation.

Chowdhury (1997) observed that there was a positively significant relationship between family size and adoption of selected BINA technologies. Similar results were found by Islam (1993), Haque (1993), Basher (1993), Khan (1993), Pal (1995) and Sarkar (1997) in their respective studies.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that family size of the respondents had negatively insignificant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

Islam (2005) conducted a study on adoption of pashu pusti in cattle rearing at farmers' level. He observed that family size of the respondents had insignificant relationship with their extent of adoption of pashu pusti in cattle rearing at farmers' level.

2.2.4 Farm size and adoption of innovation

Ali *et al.* (1986) found a strong negative relationship between farm size and adoption of improved sugarcane production practices.

Hossain (1991) conducted a study to determine the extent of adoption behavior of contract wheat growers in sadar upazila of Jamalpur district. He found negatively insignificant relationship between farm size of the farmers and their level of adoption of improved farm practices.

Ali (1993) in his study found that farm size of the respondents had no significant relationship with STP adoption behavior of sugarcane farmers.

Basher (1993) conducted a study on the adoption of intercropping of sugarcane. He observed that there was no relationship between farm size of the respondent farmers and their adoption of sugarcane intercropping.

Haque (1993) has conducted a study to determine and describe the extent of adoption of BR 14 by the farmers. He found that negatively significant relationship between farm size of the farmers and their level of adoption of BR 14 during Boro season.

Muttalab (1995) observed that farm size of the growers had a positive relationship with the adoption of improved potato varieties.
Khan (1993) observed that farm size was positively related to the adoption of insecticides.

Chowdhury (1997) observed that there was a positively significant relationship between farm size and adoption of selected BINA technologies. Similar results were found by Islam (1993), Haque (1993), Bashar (1993), Khan (1993), Pal (1995) and Sarkar (1997) in their respective studies.

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice in sadar upazila in Mymensingh district. He found that farm size of the farmers had a significant positive relationship with their adoption regarding Aalok 6201 hybrid rice.

Aurangozeb (2002) observed that there was no relationship between homestead area and adoption of integrated homestead farming technologies.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that farm size of the farmers had a positive significant relationship with their adoption of modern agricultural technologies.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that farm size of the respondents had

insignificant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

2.3.5 Annual income and adoption of innovation

Hossain (1991) conducted a research study on the adoption behavior of contact wheat growers. In the study, he found that there was negatively insignificant relationship between the annual income of contact growers and the adoption of improved farm practices in wheat cultivation.

Singh (1991) found that income of the farmers was associated with the level of adoption of plant protection measures. He also found that low income farmers had greater tendency to apply less than the recommended doses.

Haque (1993) found a negative and significant relationship between farm income and adoption of improved practices in sugarcane cultivation.

Khan (1993) found significant relationship between annual income of the farmers and their adoption of insecticides.

Pal (1995) in his study found a positive and significant relationship between income of the farmers and their adoption of recommended practices in sugarcane cultivation.

Chowdhury (1997) found that the annual income of the respondents had a positively significant relationship with their adoption of selected BINA technologies.

Hussen (2001) conducted a study on farmer's knowledge and adoption of modern sugarcane cultivation practices. He found that annual income of the growers had a positive significant relationship with their adoption of modern sugarcane cultivation practices.

Aurangozeb (2002) in his study found a positive significant relationship between annual income and adoption of integrated homestead farming technologies.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that annual income of the farmers had a positive significant relationship with their adoption of modern agricultural technologies.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that annual income of the respondents had insignificant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

2.2.6 Farming experience and adoption of innovation

Chowdhury (1996) conducted a study in Nowabgonj, Dhaka on the factors affecting adoption behaviour of Boro rice growers. He reported that farming experience significantly influenced farmers in accepting production technology

2.2.7 Extension contact and adoption of innovation

Ali (1993) conducted a study based on farmer's response to space transplanting technology of sugarcane. He found a significant positive relationship between extension contact and adoption. Similar results were obtained by Kher (1992), Haque (1993), and Pal (1995).

Alam (1997) studied use of improved farm practices of rice cultivation by the farmers of Anwara thana of Chittagong district. His study indicated no significant relationship of extension contact of farmers with their use of improved farm practices in rice cultivation.

Roy (1997) conducted a study in Magura sadar thana on factors associated with the extent of adoption of IPM practices. He found that extension contact had positive relationship with the extent of adoption of IPM practice.

Sarkar (1997) observed a positive and significant relationship between extension contact and adoption of improved potato cultivation practices.

Rahman (1999) found that extension contact of the boro rice farmers had a significant positive relationship with their adoption of balanced fertilizers in boro rice cultivation.

Hossain (1999) conducted a study to determine the farmer's perception of the effect of agro-chemicals on environment. He found that there was no relationship between the farmers media exposure with the adoption of agro-chemicals.

Rahman (2001) found that extension contact of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

Aurangozeb (2002) observed that there was significant relationship between farmer contact with extension media and adoption of integrated homestead farming technologies.

Sardar (2002) conducted that the extension contact had positively significant relationship with their adoption of IPM practices.

Hoque (2003) concluded that extension contact of the farmers had significant positive relationship with their adoption of modern maize cultivation technologies.

2.2.8 Training and adoption of innovation

Sardar (2002) conducted a study on adoption of IPM practices by the farmers under PETRRA projects of RDRS. He found that training experience of the farmers had a positive significant relationship with their adoption of IPM practices.

Islam (2005) conducted a study on adoption of pashu pusti in cattle rearing at farmers' level. He observed that training orientation of the respondents had negatively significant relationship with their extent of adoption of pashu pusti in cattle rearing at farmers' level.

2.2.9 Organizational participation and adoption of innovation

Hossain (1983) conducted a research in Bhabakali union of Mymensingh district to examine the relationships of the farmer's characteristics with their adoption of HYV of rice as transplanted amon rice. He found no relationships between organizational participation of rice cultivators and their adoption of HYV rice.

Haque (1984) conducted a study in Jessore district on the adoption of improved practices in sugarcane cultivation. He reported that organizational participation of the growers significantly influenced their adoption of the improved practices.

2.2.10 Cosmopoliteness and adoption of innovation

Hossain (1991) undertook a research study on the adoption behaviour of contact wheat growers in sadar upazila of Jamalpur district. He observed that there were no significant relationship between the cosmopoliteness of the growers and improved farm practices. Similar findings were observed by Islam (1996).

Islam (1993) found a significant relationship between cosmopoliteness of the farmers and their adoption of recommended doses of fertilizer and plant protection measures in potato cultivation.

Pal (1995) conducted a research study on the adoption of recommended sugarcane cultivation practices by the farmers. He observed that the cosmopoliteness of the farmers had significant positive relationship with their adoption of recommended sugarcane cultivation practices.

Chowdhudy (1997) conducted a study on the adoption of selected BINA technologies by the farmers of Boyra union in Mymensingh district. He found that there was no significant relationship between farmers cosmopoliteness and their composite adoption of selected BINA technologies.

Hossain (1999) found a positive significant relationship between cosmopoliteness of the farmers and their adoption of improved practices.

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice in Sadar upazilla of Mymensingh district. He found that cosmopoliteness of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

Aurangozeb (2002) conducted a study on adoption of integrated farming technologies by the rural women in RDRS. He found that there was a positive relationship among cosmopoliteness and their adoption of integrated farming technologies.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that cosmopoliteness of the respondents had insignificant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

2.3 The Conceptual Framework of the Study

Review of the past studies and literature indicated various factors influenced the adoption of brinjal production technologies by the farmers. It is sometimes difficult to deal with all the factors in a single study.

Related literature, discussion with the experts and research fellows in the relevant field and available resources at hand helped the researcher in selecting

ten variables to assess the adoption of brinjal production technologies by the brinjal growers.

In this study, researcher therefore, tried to assess the impact of some selected variables. In other words, it is assumed that the selected variables might have significant influence on the farmers in adopting the brinjal production technologies (Figure 2.1).

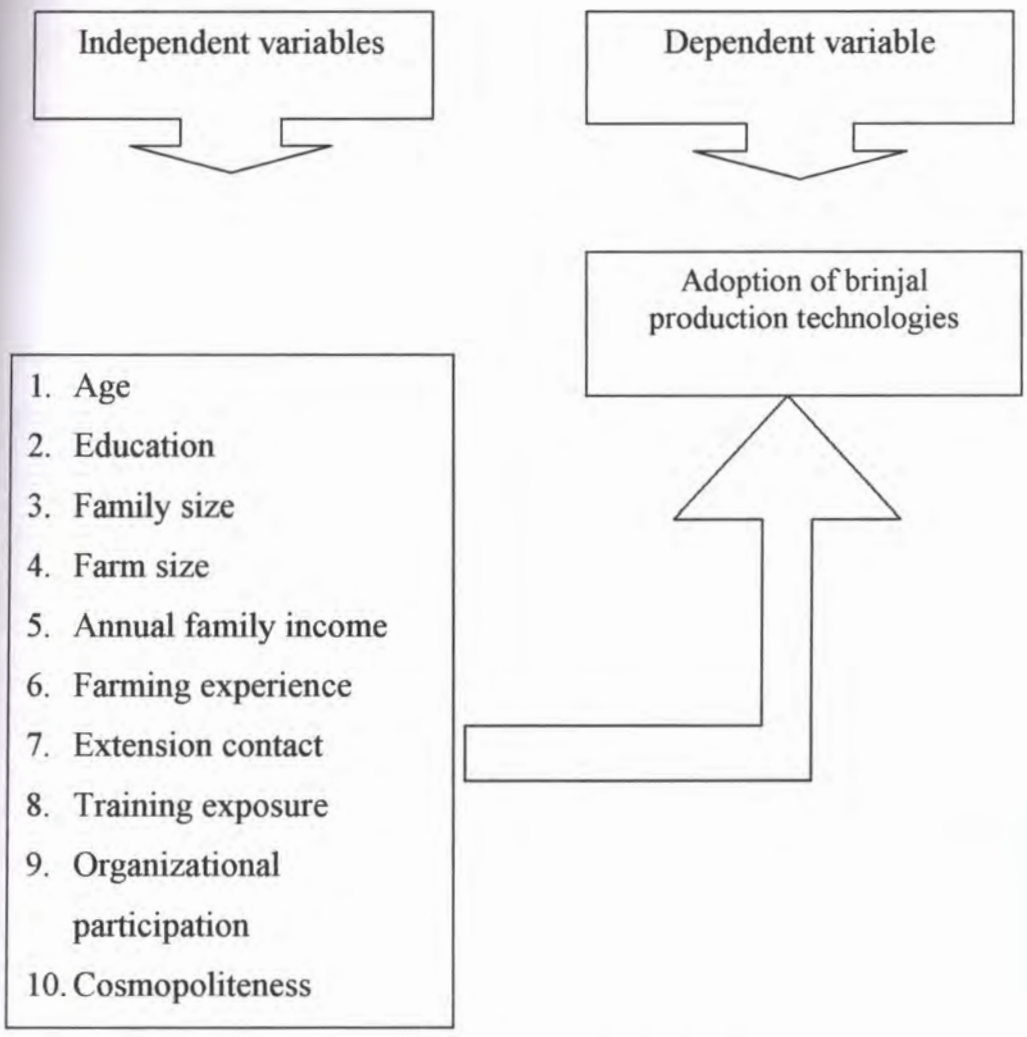


Figure 2.1. Conceptual framework of the study on adoption of brinjal production technologies

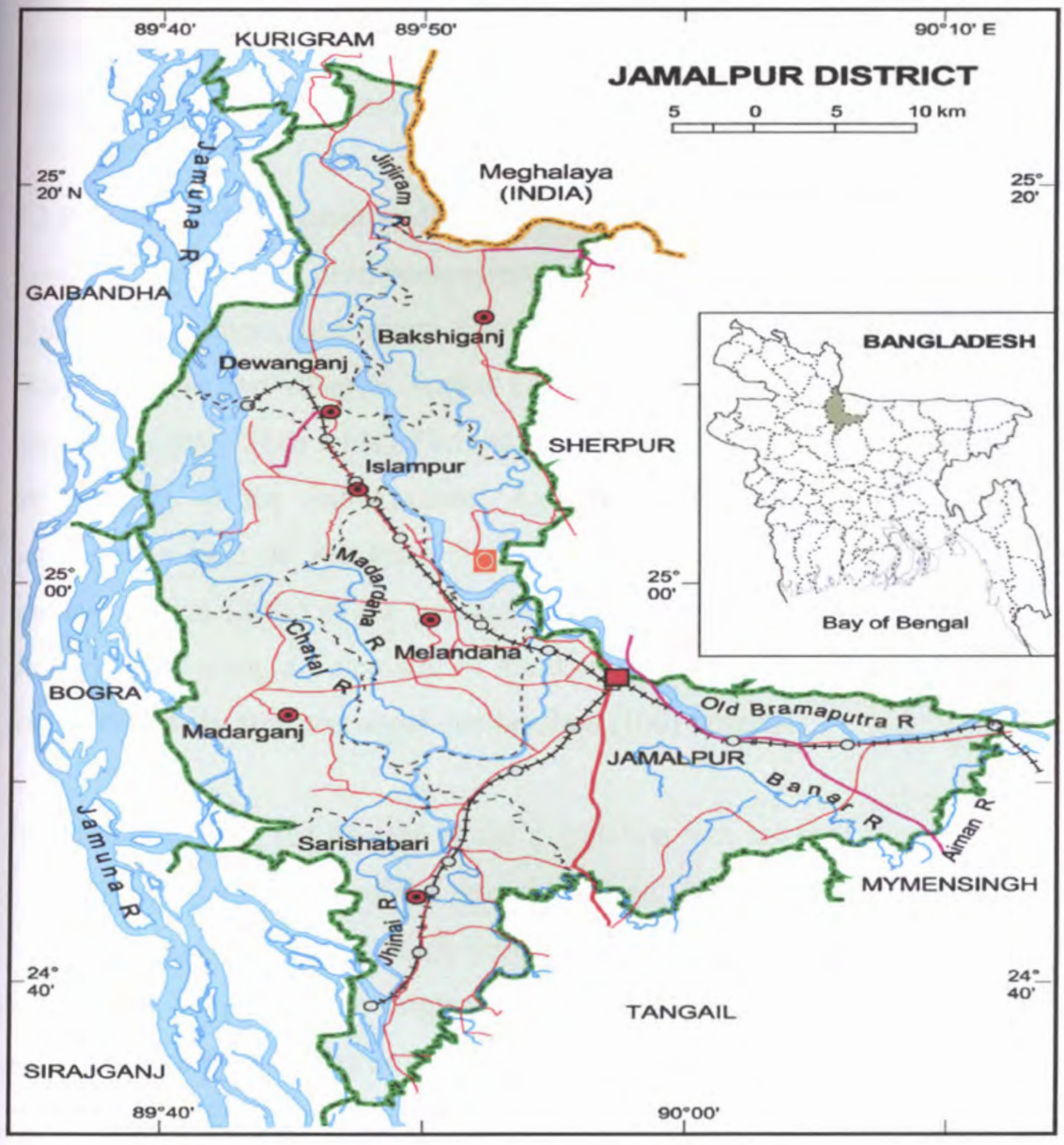
CHAPTER III

METHODOLOGY

Importance of the methods and procedure in conducting any research can hardly be over emphasized. Methodology enables the researcher to collect valid and reliable information and to analyze the same properly to arrive at correct decisions. Keeping this in view, the researcher took utmost care in using proper methods in all the aspects of this investigation. The methods and procedures followed in this study have been described in this chapter.

3.1 Locale of the study

The study was conducted in two villages namely Topkar Choar and Choar Bosonto at Shampur union under Islampur upazila of Jamalpur district. Islampur upazila is 164.38 sq km area and population 1, 72,650 male 95,890 female 76,760. The density of population is 988 per sq km. Main occupations were Agriculture 85%, business 10% and others 5%. There were cultivated mainly Paddy, wheat, sugarcane, potato and onion. NGO activities operationally important NGOs are ASA, BRAC. It consists of 12 union parishads, 73 mouzas and 107 villages. Shampur union is the north-east side of Islampur upazila. The two villages are 13 kilometers away from upazila headquarter and situated Brommuputtra River. Brinjal is the famous vegetable of the farmers of this union. The Sadar thana is located in AEZ no. 9. A map of Jamalpur district showing Islampur upazila Figure 3.1



■ : Study area

Figure 3.1 A map of Jamalpur district showing the study area

3.2 Design of the Study

The design of the study was a descriptive survey research. It was designed to determine and describe the extent of adoption of brinjal production technologies. Efforts were also made to assess the problems of the brinjal growers in adopting the brinjal production technologies.

3.3 Population and Sampling Design

Sampling method was used purposively to select the villages under the study. Out of twelve unions, one union- Shampur was selected purposively. From this Shampur union two villages- Topker Choar and Choar Bosonto were selected purposively also. Then a list of brinjal growers of these two villages was made by the help of the Sub-Assistant Agricultural Officer (SAAO). The list comprised a total of 500 farmers constituting the population of this study. Twenty percent (20%) of the population was randomly selected as sample of population by using a Calculator of Random Numbers. Thus, the total sample size of this study area was about one hundred (100) farmers.

In addition to that, (2) percent of the population was selected randomly and proportionately from each of the selected village. Thus, the additional sample, so drawn stood 10 farmers, which were included in the reserve list. In case, the individuals included in the original samples were not available or not found suitable at the time of data collection, the farmers of the reserve list were used for the purpose. The distribution of the farmers included in the population, sample and those in the reserve list appears in Table 3.1

Table 3.1. Distribution of population and sample of the respondents in two selected villages of Islampur upazila

Sl. No.	Union	Village	Target Population	Sample	Reserve list
1.0	Shampur	Choar Bosonto	283	56	6
		Topker Choar	224	44	4
Total			507	100	10

3.4 Selection of the Variables of the Study

A variable is any characteristics which can assume varying or different values in successive individual cases. The researcher keeping all these in mind took adequate measurement in selecting the dependent and independent variables of the study. Before setting the variable of the study, the researcher himself visited the study area and talked to the farmers and he was able to observe the selected characteristics of the farmers (in the study area) which might have influence on the adoption of brinjal production technologies. Based on this experience, review of literature, discussion with the relevant experts and academicians and also with the research supervisor, the researcher selected the dependent and independent variables. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variables (Townsend, 1953).

The dependent variable is often called 'criterion or predicted variable' whereas independent variable is called 'treatment, experimental or antecedent variable'. Ezekiel and Fox (1959) stated variable as any measurable characteristics, which can assume varying or different values in successive individual cases.

3.4.1 Independent variables

The Research Advisory Committee and the researcher selected ten characteristics of the farmers as independent variables of the study. These were age, education, family size, farm size, annual income, farming experience, extension media contract, training exposure, organizational participation, cosmopoliteness,

3.4.2 Dependent variables

The dependent variable of the study was adoption of brinjal production technologies. It was not possible to measure all the technologies. However, four technologies were considered in this study. These were variety, transplanting method, fertilizer application and use of integrated pest management.

3.5 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:

3.5.1. Measurement of Independent Variable

Ten selected characteristics of brinjal growers were selected as independent variables. Procedures used in measuring the ten characteristics are described below:

3.5.1.1 Age

Age of the farmer referred to the period of time his birth to the time of interviewed. It was measured by counting the actual years from his birth to the time of interview on the basis of his statement. It was measured in terms of actual years. One score was assigned for each and every complete year of a respondent's age. Based on the information of respondent's age they were

classified into three categories, young aged (below 35 years), middle aged (36 to 50 years) and old aged (51 years and above).

3.5.1.2 Education

Education was measured by the number of classes passed by an individual. 0 score was assigned for non schooling and 1 score was assigned for class one and subsequently 2, 3, 4, 5 and so on for one higher classes. For example, if a respondent passed class V, his education score was given as 5. A score of 0.5 (half) was given to that respondent who could sign his name only.

3.5.1.3 Family size

Family size of brinjal growers referred to the total number of members in his/her family including the respondent himself, his wife, sons & daughters and other members fully or partially dependent on him. The total number of family member was considered has 6 members in his family, then his family size score was 6.

3.5.1.4 Farm size

Farm size was estimated on the basis of the cultivated area either owned by a farmer or cultivated on share cropping, the area being estimated in terms of full benefit to the respondents. The farm size of a respondent was measured in hectares using the following formula:

$$FS = A + B + C + \tfrac{1}{2}(D+E) + F$$

Where,

FS = Farm size

A = Homestead area

B = Own land under own cultivation

C = Land taken from others on lease

D = Land given to others on borga

E = Land taken from others on borga

F = others (pond, fruits garden etc.)

3.5.1.5 Annual family income

The annual income of a farmer is an important indicator of how much he can invest in his farming business. Annual income means the total earning in taka by the respondents himself and the members of his family from agriculture, and other sources during a year. It was expressed in taka. The value of all the agriculture products encompassing crops, livestock, poultry, fisheries, fruits and vegetables etc. were taken into consideration for calculating annual income. Earning from each respondent and other member of his family from non-agriculture source (service, business, agricultural labor and others) was also determined by asking question to the respondent farmer. Annual income of individual was expressed in 1,000 Taka. A score of one was given for each TK. 1,000 to compute the annual income scores of the respondents.

3.5.1.6 Farming experience

Farming experience of a farmer was defined on the basis of his involvement in farming activities. Score 1 was assigned to one year of farming activities. Score 2 for two years and so on.

3.5.1.7 Extension contact

This term refers to one's becoming accessible to the influence of extension program through different communication media and sources. An extension contact scores was computed for each respondent on his extent of contact with 13 selected media. Each respondent was asked to mention the frequency of his contact with each of the 13 selected media. Here the score the measured as 0 for no contact, 1 for rarely, 2 for occasionally, 3 for often and 4 for frequently of the contact respectively. Extension media contact score of the respondents could range from 0 to 39, where 0 indicating no extension media contact and 39 indicating very high extension media contact. Respondent's extension contact score was obtained by adding the weights for his responses to all the sources listed in the instrument.

3.5.1.8 Training exposure

Training exposure was counted by the total number of days a respondent attended in training course. Respondent received short/long term training in his entire life up to the date of interviewing as provided different organizations was considered for this variable. In this study, training exposure score was computed for each respondent's on the basis of his responses. Which was responses on the training his score was 1 and no training responses score 0, as shown in item no. 8 of the interview schedule.

3.5.1.9 Organizational participation

Organizational participation of the respondent was measured in two-dimension status of his participation and duration of participation in different organizations during the time of interviewing.

Organizational participation score was determined by the following formula:

Organizational participation score = O1 x 1 + O2 x 2 + O3 x 3

Where,

O1 = Total duration (year) of participation as general member

O2 = Total duration (year) of participation as executive committee member

O3 = Total duration (year) of participation as executive committee officer

Organizational participation score of the respondent was computed on the basis of his participation in different organizations as shown in item 9 on the interview schedule. Scores were assigned for participation of a respondent in an organization in the following manner.

Nature of participation	Score assigned
No participation	0
General member	1
Executive member	2
Executive Officer	3

Organization participation score of a respondent was determined by adding his scores for participation in all organizations. Thus, the organizational participation score could range from 0-9, 0 indicated no participation and 9 indicated high participation.

3.5.1.10 Cosmopoliteness:

Cosmopoliteness scores of the respondents were computed on the basis of respondents' visit to eight different places external to his own social system and as shown in item number 10 in the interview schedule. The respondents indicated whether they visited those places frequently, occasionally, rarely and not at all. Weights assigned to these visits were 3, 2, 1 and 0 respectively. A respondent's cosmopoliteness score was obtained by adding the weights for his visits to all the places listed in the instrument. Cosmopoliteness score could range from 0 to 30 where 0 indicating no cosmopoliteness and 30 indicating high cosmopoliteness.

3.5.2 Measurement of Dependent Variable

The procedure followed in measuring the dependent variable is presented below:

Adoption of selected brinjal production technologies

Adoption of selected brinjal production technologies was measured by computing adoption quotient. It was calculated by asking farmers used

- Recommended brinjal variety,
- Use of line transplanting method
- Recommended doses of fertilizer
- Use of IPM (Integrated Pest Management) practice

Adoption of selected brinjal production technologies was measured by Mean Adoption Quotient as the following formula suggested by Bhuiyan (2005)

$$AQ = \frac{\sum u/p}{y \times n} \times 100$$

Where,

u = Use of area

P = Potential of area

y = Years of use of technologies use

n = Number of technologies

Thus adoption of selected brinjal production technologies score of a respondent could range from 0-100, while 0 indicating no adoption and 100 indicating highest adoption.

3.6 Problems Faced by the Farmers in Adopting Brinjal Production Technologies

To find out the problems confronted by the farmers in adopting brinjal production technologies, several consultation talks were held with the relevant personnel. The score obtained from all the problems were added together to get the problem confrontation score for a respondent.

Problem confrontation scores were assigned in the following:

Categories	Score
High	3
Medium	2
Low	1
Not at all	0

3.7 Instruments for Data Collection

In order to collect relevant information, a previously structured interview schedule was used as data gathering device in keeping the objectives in mind. Both open and closed form questions were used in collecting data. Simple and direct questions were included in the schedule to ascertain dependent and independent variables. The interview schedule was presented with ten farmers in actual field situation before finalizing the same for collection of data. On the test experiences, necessary additions, corrections and modifications of the schedule were done. Valuable suggestions and comments were received from the research supervisor and co-supervisor. Appropriate scales were developed to operationalize some selected characteristics of the brinjal growers. The interview schedule was prepared in Bangla. A copy of the interview schedule in English version is presented in the Appendix-B.

3.8 Collection of Data

Data for this study were collected through personal interview by the researcher himself. All possible efforts were made to explain the purpose of the study to the respondents in order to get valid and pertinent information from them. Interviews were usually conducted with the respondents in their homes. While starting interview with any respondent the researcher took all possible care to establish rapport with him so that he did not hesitate to furnish proper responses to the questions and statements in the schedule. However, if any respondent failed to understand any question the researcher took care to explain the issue. He received excellent co-operation from the respondents and others concerned during the time of interview. The entire process of collecting data took place during 10 February to 10 March 2006.

3.9 Data Processing and Analysis

After completion of field survey, all the data were processed according to the objectives of the study. Local units were converted into standard unit. All the individual responses to questions of the interview schedule were transferred to master sheet to facilitate tabulation, categorization and organization to the objective of the study. In case of qualitative data, appropriate scoring technique

was followed to convert the data into quantitative form. Data was transferred to coding sheet with numerical scores given to each question. Simple statistics like frequency, percentage, range, mean, standard deviation and rank order were used to perform the data analysis. Correlation coefficients were to determine the relationships between selected characteristics of the farmers and adoption of brinjal production technologies.

3.10 Statement of Hypothesis

Defined by Goode and Hatt (1952), "A hypothesis is a proposition which can be put to a test to determine its validity. It may be true or false, it may seem contrary to, or in accord with common sense. However, it leads to an empirical test". According to Kerlinger (1973), a hypothesis is a conjectural statement of the relation between two or more variables. Hypotheses are always in declarative sentence form and they relate either generally or specifically variables to sentence form and they relate either generally or specifically variables to variables. Hypothesis may be broadly divided into two categories, namely, research hypothesis and null hypothesis.

3.10.1 Research hypothesis

The following research hypotheses were put forward to know the relationships between each of the ten selected characteristics of the brinjal growers and their adoption of brinjal production technologies. Each of the ten selected characteristics of the brinjal growers will have significant relationships with their adoption of brinjal production technologies.

3.10.2 Null hypothesis

For the statistical test of the research hypotheses they were converted into null form. The null hypotheses were as follows. "There is no relationship between the selected characteristics of the brinjal growers and their adoption of brinjal production technologies". The selected characteristics are age, education, family size, farm size, annual income, farming experience, extension media

contact, training exposure, organizational participation, cosmopoliteness. If the null hypothesis is rejected on the basis of a statistical tests, it is assumed, that there is a relationship between the concerned variables.

3.11 Statistical Analysis

The collected data were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. Qualitative data were quantified by means of suitable scoring techniques. The statistical measures such as range, mean, standard deviation, percentage distribution and rank order were used to describe both the independent and dependent variables. Tables were also used in presenting data for clarity of understanding. In order to explore the relationships of the selected characteristics of the growers with their adoption of brinjal production technologies, the Pearson's Product Moment Correlation Co-efficient was computed. Five percent (0.05) and one percent (0.01) level of significance was used as the basis of rejecting any null hypothesis. If the computed value of co-efficient of correlation "r" was equal to or greater than tabulated value at designated level of significance for the relevant degrees of freedom, the null hypothesis was rejected and it was concluded that there was a significant relationship between the concerned variables. However, when the calculated value of co-efficient of correlation was found to be smaller than the tabulated value at the designated level of significance for the relevant degrees of freedom, it was concluded that the null hypothesis was accepted and hence, there was no relationship between the concerned variables. Co-efficient values significant at 0.05 level is indicated by single asterisk (*) and at 0.01 level by double asterisks (**).

CHAPTER IV

RESULT AND DISCUSSION

In this Chapter, the findings of the study and interpretation of the results have been presented. Data obtained from respondents by interview were measured, analyzed, tabulated and statistically treated according to the objectives of the study. The **first** section deals with the selected characteristics of the brinjal growers, the **second** section deals with the extent of adoption of brinjal production technologies by the farmers, the **third** section, relationships between the extent of adoption of brinjal production technologies of the farmers and their characteristics have been discussed. The **fourth** section deals with the problems confrontation of the brinjal farmers in brinjal production technology practice.

4.1 Selected Characteristic of the farmers (Independent variable)

This section deals with the classification of the farmers according to their various characteristics. Behavior of an individual is largely determined by his characteristics. These characteristics of an individual contribute to a great extent in the matter of shaping of his behavior. In this section the findings on the farmer's ten selected characteristics have been discussed. The selected characteristics are (i) age, (ii) education, (iii) family size, (iv) farm size, (v) annual family income, (vi) farming experience, (vii) extension contact, (viii) training exposure, (ix) organizational participation and (x) cosmopoliteness. Range, mean and standard deviations of these characteristics of the brinjal growers are described in this section.

4.1.1 Age

The age of the farmers was found to range from 26 to 72 years, the average being 43.79 years and the standard deviation was 8.68. On the basis of their age, the farmers were classified into three categories 'young aged' (up to 35), 'middle aged' (36-50) and 'old aged' (above 50). The categories and distribution of the farmers are shown in Table 4.1.1

Table 4.1.1 Distribution of the farmers according to their age

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Young aged (up to 35)	26	26%	43.79	8.68
Middle aged (36-50)	55	55%		
Old aged (>50)	19	19%		

Analyses of data furnished in Table 4.1.1 showed that majority (55%) of the farmers were middle aged as compared to 26 percent being young and 19 percent being old categories respectively. More than four-fifths (81%) of the farmers fell in the young to middle aged category. This indicates that decision making in relating of farming aspects in the study area could have considerable influence by young and middle aged farmers. Therefore, it was expected that the extent of adoption of brinjal production technologies would be reflected more in the young and middle aged farmers compared to old aged farmers.

4.1.2 Education

The education score of the farmers ranged from 0-14. The average was 3.71 and the standard deviation was 4.15. On the basis of their educational scores, the brinjal growers were classified into four categories, namely; "illiterate/can sign only" (0-0.5), 'primary' (1-5) 'secondary' (6-10) and 'above secondary'

(above 10). The distribution of the farmers according to their education is shown in Table 4.1.2

Table 4.1.2 Distribution of the farmers according to their education

Categories	(Farmers N=100)		Mean	SD
	Number	percent		
Illiterate/ can sign only (0-0.5)	56	56%	3.71	4.15
Primary level (1-5)	16	16%		
Secondary level (6-10)	20	20%		
Above secondary level(>10)	8	8%		

From the above Table, it was observed that the majority (56 percent) of the brinjal farmers had illiterate and can sign only where as 16 percent were primary educated 20 percent farmers were secondary educated and 8 percent were higher educated respectively. The findings indicate that education of and individual is likely to be more receptive to the modern facts and ideas; they have much mental strength in deciding of a matter related to problem solving.

4.1.3 Family size

The family size of the brinjal farmers ranged from 2 to 10 members. The average was 4.79 with a standard deviation of 1.62. On the basis of their family size, the farmers were classified into the following three categories: "small family" (up to 3), "medium family" (4-7) and "large family" (above 7). Table 4.1.3 contains the distribution of the brinjal growers according to their family size.

Table 4.1.3 Distribution of farmers according to their family size

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Small family (up to 3)	13	13%	4.79	1.62
Medium family (4-7)	74	74%		
Large family (>7)	13	13%		

This table indicates that the highest proportion (74 percent) 74 percent of the brinjal growers had medium family of 4 to 7 members compared to 13 percent had large family. Thus 87 percent of the brinjal farmers had medium to large families. The average family size of 4.79 of the farmers was equal the national average of 4.9 (BBS, 2003).

4.1.4 Farm size

The farm size of the farmers varied from 0.24 to 2.92 hectares. The average farm size was 0.68 hectare with a standard deviation of 0.44. The farmers were classified into the following three categories based on their farm size: "marginal farm" (up to 0.3 ha), "small farm" (0.31 – 1.0 ha) and "medium farm" (1.0 -3.0). The distribution of the farmers according to their farm size is shown in Table 4.1.4

Table 4.1.4 Distribution of the farmers according to their farm size

Categories	Farmers (N =100)		Mean	SD
	Number	Percent		
Marginal farm(up to 0.3 ha)	5	5%	0.68	0.44
Small farm(0.31-1.0 ha)	81	81%		
Medium farm(1.1-3.0 ha)	14	14%		

More than forth-fifths (81 percent) of the farmers possessed small farms compared to above 14 percent of them having medium farms and only 5 percent marginal farms. Thus, most (96 percent) of the farmers were in the categories of small and medium farm size. The average farm size of the farmers was 0.68 ha.

4.1.5 Annual family income

The annual income of the farmers ranged from 14.33 thousand Tk. to 192.20 thousand Tk. the mean being 71.47 thousand Tk. and standard deviation 37.11 thousand. Based on their annual income scores, the farmers were classified into three categories: "low income" (up to 35), "medium income" (36 to 100.00) and "high income" (above 100). The distribution of the farmers according to their family annual income is shown in Table 4.1.5

Table 4.1.5 Distribution of the farmers according to their annual family income

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Low income(up to 35)	13	13%	71.47	37.11
Medium income(35.10-100.00)	70	70%		
High income (above 100)	17	17%		

From the above Table, it was observed that the highest portion (70%) of the respondents were medium income group, while 13 percent farmers were low income group and 17 percent were high income group. Most of the farmers of the study area were low to medium group. The average income of the farmers was much higher of the study area than national average income of the country. This might be due to the fact that the farmers of the study area were not

engaged in only agriculture. They earned from other sources such as service, business etc.

4.1.6 Farming experience

Farming experience of the respondents ranged from 2 to 21 years with an average of 7.35 and the standard deviation was 3.64. Based on the farming experience, the farmers were classified into three categories as shown in Table 4.1.6

Table 4.1.6 Distribution of the farmers according to their farming experience

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Low experience (up to 4)	22	22%	7.35	3.64
Medium experience (5-10)	62	62%		
High experience (above 10)	16	16%		

From the above Table, it was observed that majority (62%) of the farmers had medium farming experience while 22 percent had low farming experience and 16 percent had high farming experience of the study area.

4.1.7 Extension contact

The computed extension contact scores of the farmers ranged from 16 to 37 with an average of 26.0 and a standard deviation of 5.0 against the possible range of 0 to 39. On the basis of their extension contact scores, the farmers were classified into three categories: "low extension contact" (up to 21), "medium extension contact" (22-31) and "high extension contact" (above 31). The distribution of the farmers according to their extension contact is shown in Table 4.1.7

Table 4.1.7 Distribution of the farmers according to their extension contact

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Low extension contact(up to 21)	17	17%	26.0	5.0
Medium extension contact(22-31)	65	65%		
High extension contact(>31)	18	18%		

This table indicates that majority (65 percent) of the farmers had medium extension contact, while 18 percent of them had high contact. The proportion of the farmers having low extension contact was only 17 percent. Thus, about four-fifths (83 percent) of the farmers had medium to high extension contact.

4.1.8 Training exposure

Training exposure plays an important role in motivating the farmers in adoption of modern technologies. Training exposure of the farmers range from 0-1 with an average 2.15 and the standard deviation was 3.87

Table 4.1.8 Distribution of the farmers according to their training exposure

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
No training response	65	65%	2.15	3.87
Training response	35	35%		

Data presented in above Table, indicate that the most (65 percent) of the farmers were response for training program and 35 percent of the farmers no

response for training exposure. Training exposure was helpful for the farmers to better understanding of the selected brinjal production technologies.

4.1.9 Organizational participation

Organizational participation scores of the farmers ranged from 0 to 13 with an average of 4.76 and a standard deviation of 3.66 against the possible range of 0 to 42. On the basis of their organizational participation scores, the farmers were classified into four categories: "no participation" (0), "low participation" (1-4), "medium participation" (5-8) and "high participation" (9-13). The distribution of respondents according to their organizational participation is shown in Table 4.1.9

Table 4.1.9 Distribution of the farmers according to their organizational participation

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
No participation (0)	21	21%	4.76	3.66
Low participation (1-4)	33	33%		
Medium participation (5-8)	29	29%		
High participation (9-13)	17	17%		

From the above Table it was observed that majority (33 %) of the farmers had low organizational participation. A mentionable (21%) number of farmers had no organizational participation, while 29 percent had medium and 17 percent had high participation. Therefore, it was clearly indicated that maximum farmers were engaged only their own occupation.

4.1.10 Cosmopoliteness

Cosmopoliteness scores of the farmers ranged from 11 to 29 with an average of 22.72 and a standard deviation of 3.98 against the possible range of 0 to 30. On the basis of their cosmopoliteness scores, the farmers were classified into three categories: "low cosmopolite" (0-19), "medium cosmopolite" (20-26) and "high cosmopolite" (above 26). The distribution of the farmers according to their cosmopoliteness is shown in Table 4.1.10

Table 4.1.10 Distribution of the farmers according to their cosmopoliteness

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Low cosmopolite (up to 19)	20	20%	22.72	3.98
Medium cosmopolite (20-26)	62	62%		
High cosmopolite (>26)	18	18%		

Data presented in the Table, show that majority (62 percent) of the farmers were "medium cosmopolite" compared to 20 percent of them being "low cosmopolite" and 18 percent "highly cosmopolite". Thus, almost all (82 percent) of the farmers were medium to low in terms of their cosmopoliteness.

4.2 Adoption of Selected brinjal production technologies

There are many technologies in brinjal production. In this study only four important dimensions were taken into consideration for determining adoption of brinjal production technologies. The four dimensions were:

1. Recommended brinjal varieties
2. Use of line transplanting method
3. Recommended doses of fertilizer
4. Use of IPM practices for controlling pests and disease of brinjal

According to the measurement procedure of adoption of selected brinjal production technologies mentioned in methodology chapter. The adoption of four brinjal production technologies of the farmers ranged from 28 to 72 against the possible score of 0 to 100. The average adoption was 47.58 with a standard deviation of 11.36. Based on the adoption score, the farmers were classified into three categories: "low adoption" (up to 36), medium adoption" (37-60) and "high adoption" (above 60).

Table 4.2 Distribution of the farmers according to their adoption of brinjal production technologies

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Low adoption (up to 36)	17	17%	47.58	11.36
Medium adoption (37.-60)	69	69%		
High adoption (above 60)	14	14%		

Data contained in Table 4.2. indicate that the highest proportion (69 percent) of the farmers had medium adoption as compared to 14 percent high adoption and 17 percent low adoption. Data also revealed that majority (83 percent) of the

farmers of the study area had medium to high level of adoption of brinjal production technologies. For clarity of understanding farmer's adoption of brinjal production technologies has been diagrammatically shown in Figure 4.1

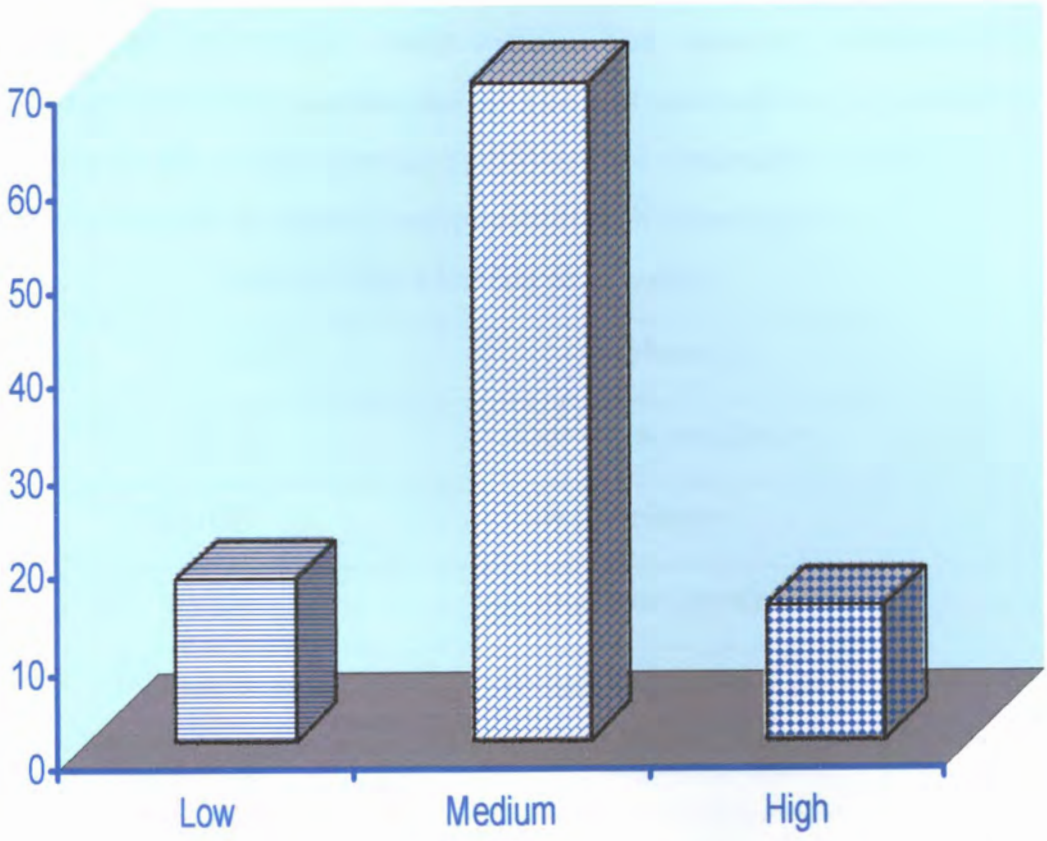


Figure 4.1 Farmers composite adoption of selected brinjal production technologies

Figure 4.1 it was showed that the majority (69%) proportion of the farmers was medium adoption of brinjal production, while 17 percent of the farmers were low and 14 percent of the farmers were high adoption.

4.3 Relationships between the selected characteristics of the brinjal growers and their adoption of brinjal production technologies

Coefficient of correlation was computed in order to explore the relationship between the selected characteristics of the brinjal growers and their adoption of selected brinjal production technologies. The selected characteristics constituted independent variables and adoption of selected brinjal production technologies by the brinjal growers constituted the dependent variable. Table 4.3 has been used for descriptive interpretation of the meaning of 'r'.

Table 4.3 The Meaning of 'r' values

'r' Value	Meaning
0.00 to 0.19	A very low correlation
0.20 to 0.39	Low correlation
0.40 to 0.59	A moderate correlation
0.60 to 0.79	A high correlation
0.80 to 1.00	A very high correlation

Source: Cohen and Holliday, 1982; 92-93.

As mentioned earlier, the ten characteristics of the brinjal growers were the independent variables of the study. The variable were: age, education, family size, farm size, annual family income, farming experience, extension contact, training exposure, organizational participation, cosmopoliteness. The dependent variable was adoption of brinjal production technologies. To explore the relationships, Pearson's product moment correlation co-efficient (r) has been used to test the hypothesis concerning the relationships between two variables. Five percent, one percent level of significance were used as the basis of acceptance or rejection of a hypothesis. The summary of the results of the correlation co-efficient between the selected characteristics of the growers and their adoption of brinjal production technologies is shown in Table 4.4

Table 4.4 Co-efficient of correlation of the selected characteristics of the respondents and their adoption of brinjal production technologies

Independent variable	Computed value of 'r'	Dependent variable	Table value of 'r' of 98 degrees of freedom	
			0.05%	0.01%
Age	0.116 ^{NS}	Adoption of brinjal production technologies	0.196	0.226
Education	0.340**			
Family size	0.216 *			
Farm size	0. 779**			
Annual income	0. 629**			
Farming experience	0.206*			
Extension contact	0.222*			
Training exposure	0.275* *			
Organizational participation	0. 219*			
Cosmopoliteness	0.079^{NS}			

NS = Non significant

* = Significant at 0.05 level of probability

** = Significant at 0.01 level of probability

4.3.1 Relationship between age of the brinjal growers and their adoption of brinjal production technologies

The relationship between age of the brinjal growers and their adoption of brinjal production technologies was examined by testing the following null hypothesis: "*There is no relationship between age of the brinjal growers and their adoption of brinjal production technologies.*"

As shown in the Table 4.4 the co-efficient of correlation between the concerned variables was computed and found to be 'r' = 0.116^{NS} which led to the following observation.

- Firstly, the relationship showed a positive trend.
- Secondly, a very low relationship was found to exist between the two variables.
- The computed value of 'r' (0.116^{NS}) was smaller than the table value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.
- Hence, the concerned null hypothesis was accepted.
- The correlation co-efficient between the two concerned variables was not significant.

The findings imply that the age of the brinjal growers had no influence on their adoption of brinjal production technologies. Islam (1993), Kher (1992) and Sarkar (1997) observed the similar findings in their studies.

4.3.2 Relationship between the education of the brinjal growers and their adoption of brinjal production technologies

The relationship between the education of the brinjal growers and their adoption of brinjal production technologies was examined by testing the following null hypothesis: "*There is no relationship between education of the brinjal growers and their adoption of brinjal production technologies*"

The co-efficient of correlation between the concerned variables was found to be 'r' = 0.340** as shown in Table 4.4 This led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a tendency in the positive direction between the concerned variables.
- The relationship between the concerned variables was low.
- The computed value of 'r' (0.340**) was greater than the table value (r = 0.196) with 98 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The correlation co-efficient between the two concerned variables was significant.

The findings indicate that education of the farmers had significant relationship with their adoption of brinjal production technologies. Huque (1982) found no relationship between farmer's education and perception of effectiveness of Television as a medium of agricultural information.

4.3.3 Relationship between family size of the brinjal growers and their adoption of brinjal production technologies

The relationship between family size of the farmers and their adoption of brinjal production technologies, the following null hypothesis was tested *"There is no relationship between family size of the brinjal growers and their adoption of brinjal production technologies"*

The co-efficient of correlation between the concerned variables was found to be 0.216* as shown in Table 4.4 this led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a tendency in the positive direction between the concerned variables.
- The relationship between the concerned variables was low.
- The computed value of "r" (0.216*) was greater than the table value (r= 0.196) with 98 degrees of freedom at 0.05 level of probability.
- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.
- The null hypothesis could be rejected.

Based on the above findings, the researcher concluded that the family size of the farmers had significant relationship with their adoption of brinjal production technologies.

4.3.4 Relationship between farm size of the brinjal growers and their adoption of brinjal production technologies

The relationship between farm size of the brinjal growers and their adoption of selected brinjal production technologies was examined by testing the following null hypothesis: *"There is no relationship between farm size of the brinjal growers and their adoption of selected brinjal production technologies"*

Computed value of the co-efficient of correlation between farm size of the farmers and their adoption of selected brinjal production technologies was found to be 'r' = 0.779** as shown in Table 4.4 The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a tendency in the positive direction between the concerned variables.
- A high relationship was found between the two variables.
- The computed value of 'r' (0.779**) was found to be greater than the table value (r = 0.226) with 98 degrees of freedom at 0.01 level of probability.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.
- The concerned null hypothesis was rejected

The findings indicate that the farm size of the brinjal growers had a positive significant relationship with their adoption of selected brinjal production technologies. Hence, large growers get more scope than the small growers as they can invest more money for adoption of brinjal production technologies. Many researchers Hoque (1993), Khan (1993), Pal (1995), Chowdhury (1997), Muttaleb (1995), Islam (2002) and Rahman (2002) observed the similar findings in their studies.

4.3.5 Relationship between annual family income of the brinjal growers and their adoption of brinjal production technologies

The relationship between annual income of the brinjal growers and their adoption of selected brinjal production technologies was examined by testing the following null hypothesis: "*There is no relationship between annual family income of the brinjal growers and their adoption of brinjal production technologies.*"

Computed value of the co-efficient of correlation between annual family income of the brinjal growers and their adoption of selected brinjal production technologies was found to be 'r' = 0.629** as shown in Table 4.4 The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a tendency in the positive direction between the concerned variables.
- A high relationship was found between the two variables.
- The computed value of 'r' (0.629**) was found to be greater than the table value (r = 0.226) with 98 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

The researcher concluded that annual family income of the brinjal growers had a positive significant relationship with their adoption of brinjal production technologies. Hossen (2001) found that the annual income of the sugar cane growers had a positive significant relationship with their adoption of modern sugarcane cultivation practices. Khan (1993), Pal (1995), Chowdhury (1997) and Islam (2002) also found the similar findings.

4.3.6 Relationship between farming experience of the brinjal growers and their adoption of brinjal production technologies

The relationship between farming experience of the brinjal growers and their adoption of selected brinjal production technologies the following null hypothesis was tested "*There is no relationship between farming experience of the brinjal growers and their adoption of selected brinjal production technologies.*"

The co-efficient of correlation between the concerned variables was found to be 0.206* as shown in Table 4.4 this led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a tendency in the positive direction between the concerned variables.
- The relationship between the concerned variables was low.
- The computed value of "r" (0.206*) was larger than the table value (r= 0.196) with 98 degrees of freedom at 0.05 level of probability.
- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.
- The null hypothesis could be rejected.

The researcher concluded that the farming experience of the brinjal growers had positive significant relationship with their adoption of selected brinjal production technologies. It could be possible due to the farming experience of brinjal production motivated a farmer in adopting this. Rahman (1996) found the similar finding but Choudhury (1996), Roy (1997) and Khalil (1998) had a dissimilar findings.

4.3.7 Relationship between extension contact of the brinjal growers and their adoption of brinjal production technologies

The relationship between extension contact of the brinjal growers and their adoption of selected brinjal production technologies was examined to the following null hypothesis:

"There is no relationship between extension contact of the brinjal growers and their adoption of brinjal production technologies."

The co-efficient of correlation between the concerned variables was found to be 'r' = 0.222* as shown in Table 4.4 This led to the following observations were recorded regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- A moderate relationship was found between the concerned variables.
- The computed value of 'r' (0.222*) was greater than the table value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.

Thus, the researcher concluded that the extension contact of the brinjal growers had positive significant relationship with their adoption of brinjal production technologies. The extension contact strengthened the base of their knowledge. The knowledge definitely acts as motivator towards adoption of new technologies. Hossen (2001) found that extension contact of the growers had significant relationship with their adoption of modern sugarcane cultivation practices. Kashem et al. (1990), Bashar (1993), Sarker (1997), Pal (1995), Chowdhury (1997) also found the similar findings.

4.3.8 Relationship between the training exposures of the brinjal growers and their adoption of brinjal production technologies

The relationship between training exposure of the brinjal growers and their adoption of selected brinjal production technologies was examined to the following null hypothesis: *" There is no relationship between training exposure of the brinjal growers and their adoption of brinjal production technologies."*

The co-efficient of correlation between the concerned variables was found to be 'r' = 0.275** as shown in Table 4.4. This led to the following observations were recorded regarding the relationship between the two variables under consideration:

- The relationship showed a tendency in the positive direction between the concerned variables.
- A low relationship was found between the two variables.
- The computed value of 'r' (0.275**) was found to be greater than the table value (r = 0.226) with 98 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

Based on the above findings, the researcher concluded that there was a positive significant relationship between training exposure and adoption of selected brinjal production technologies. Sardar (2002) observed the similar findings in their studies.

4.3.9 Relationship between organization participation of the brinjal growers and their adoption of brinjal production technologies

The relationship between Organization participation of the brinjal growers and their adoption of brinjal production technologies the following null hypothesis was tested *"There is no relationship between organization participation of the brinjal growers and their adoption of selected brinjal production technologies."*

The co-efficient of correlation between the concerned variables was found to be 0.219* as shown in Table 4.4 this led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a tendency in the positive direction between the concerned variables.
- The relationship between the concerned variables was low.
- The computed value of "r" (0.219*) was greater than the table value (r= 0.196) with 98 degrees of freedom at 0.05 level of probability.
- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.
- The null hypothesis could be rejected.

Based on the above findings, the researcher concluded that there was a positive significant relationship between training exposure and adoption of selected brinjal production technologies. Haque (1984) observed the similar findings in their studies.

4.3.10 Relationship between cosmopoliteness of the brinjal growers and their adoption of brinjal production technologies

The relationship between cosmopoliteness of the brinjal growers and their adoption of brinjal production technologies was examined to the following null hypothesis: *"There is no relationship between cosmopoliteness of the brinjal growers and their adoption of brinjal production technologies."*

The co-efficient of correlation between the concerned variables was found to be 'r' = 0.079^{NS} as shown in Table 4.4 This led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- A very low relationship was found to exist between the two variables.
- The computed value of 'r' (0.079^{NS}) was smaller than the table value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.
- Hence, the concerned null hypothesis was accepted.
- The co-efficient of correlation between the concerned variable was insignificant at 0.05 level of probability.

The researcher concluded that cosmopoliteness of the brinjal growers had positive and insignificant relationship with their adoption of brinjal production technologies. Aurangozeb (2002), Islam (2002), Sardar (2002), Rahman (2001) and Hossain (1999) also found the dissimilar findings.

4.4 Problem Faced by the Farmers in Adopting Brinjal Production Technologies

Problem scores of the farmers were determined by using 10 statements. Computed scores of the respondents ranged from 18 to 30 against the possible range of 0 to 30 with the average being 26.48 and the standard deviation was 2.85

Table 4.5 Distribution of the farmers according to their problems

Categories	Farmers (N = 100)		Mean	SD
	Number	Percent		
Low problems (up to 23)	15	15%	26.48	2.85
Medium problems (24-27)	67	67%		
High problems (above 27)	18	18%		

Based on problem scores, the farmers' problems were classified into three categories: "low problems" (up to 23), "medium problems" (24-27), and "high problems" (above 27). The distribution of the respondents according to their problem is shown in Table 4.5. Data presented indicate that the majority (67 percent) of the farmers faced medium problems compared to 15 percent of them faced low problem and 18 percent of the farmers faced high problems. If a farmer can be able to overcome these problems, it may contribute to the adoption of brinjal production technologies.

In order to measure the problems regarding brinjal production technologies open and closed questionnaire were used. The purpose of this section was to have an understanding on the problems faced by the brinjal growers in adopting

brinjal production technologies. Problem in each item has been presented with frequency distribution of the brinjal growers in percent.

For clear understanding of problems of the brinjal growers an index for each item along with rank order was computed by using the following formula:

Problem Facing Index (PFI) = Pho × 3 +P m0 × 2 + Pl0 × 1 +Pn0 × O

Where,

Pho = Percent of respondent with "high problem"

Pmo = Percent of respondent with "medium problem"

Plo = Percent of respondent with "low problem"

Pno = Percent of respondent with "not at all problem"

Percent of distribution at the brinjal growers according to their problems in each of the 10 items have been shown in Table 4.6 with along problem facing index (**PFI**) and rank order at each problem.

Table 4.6 Ranked order of the problems faced by the farmers in adopting brinjal production technologies

SL No	Problems	Respondent N=100				Problem facing index (PFI)	Rank order
		High (3)	Medium (2)	Low (1)	Not at all (0)		
1.	Scarcity of quality variety of seed, fertilizer and pesticides when they are needed	80	18	2	0	278	1
2.	Marketing problem	78	14	8	0	270	2
3.	High input cost (seed/seedling, fertilizer, pesticide)	72	21	4	3	262	3
4.	Lack of cash money	63	31	6	0	257	4
5.	Storage facility	65	28	4	3	255	5
6.	Lack of agricultural machineries and tools for improved cultivation	55	26	11	8	228	6
7.	Lack of extension advice	54	27	11	8	227	7
8.	Lack of technical information	57	23	7	13	224	8
9.	Excessive weed infestation	48	27	19	6	217	9
10.	Lack of knowledge about proper time of sowing/planting	45	21	19	15	196	10

Data contained in Table 4.6 indicate that the farmers faced highest problem in "Scarcity of modern verity of seed, fertilizer and pesticides when they are needed" as indicated by its PFI of 278. This is the main problem of the farmers in adopting brinjal production technologies. The second and third problems faced by them are "Marketing problem" and "High input cost (seed/ seedling,

fertilizer and pesticide) respectively. In this way, comparatively less problem faced by the farmers is "Lack of knowledge about proper tome of sowing/ planting" that means it is not a serious problem for the farmers in adopting brinjal production technologies.

Problem facing of the farmers in adopting brinjal production technologies has been diagrammatically shown in Fig. 4.2

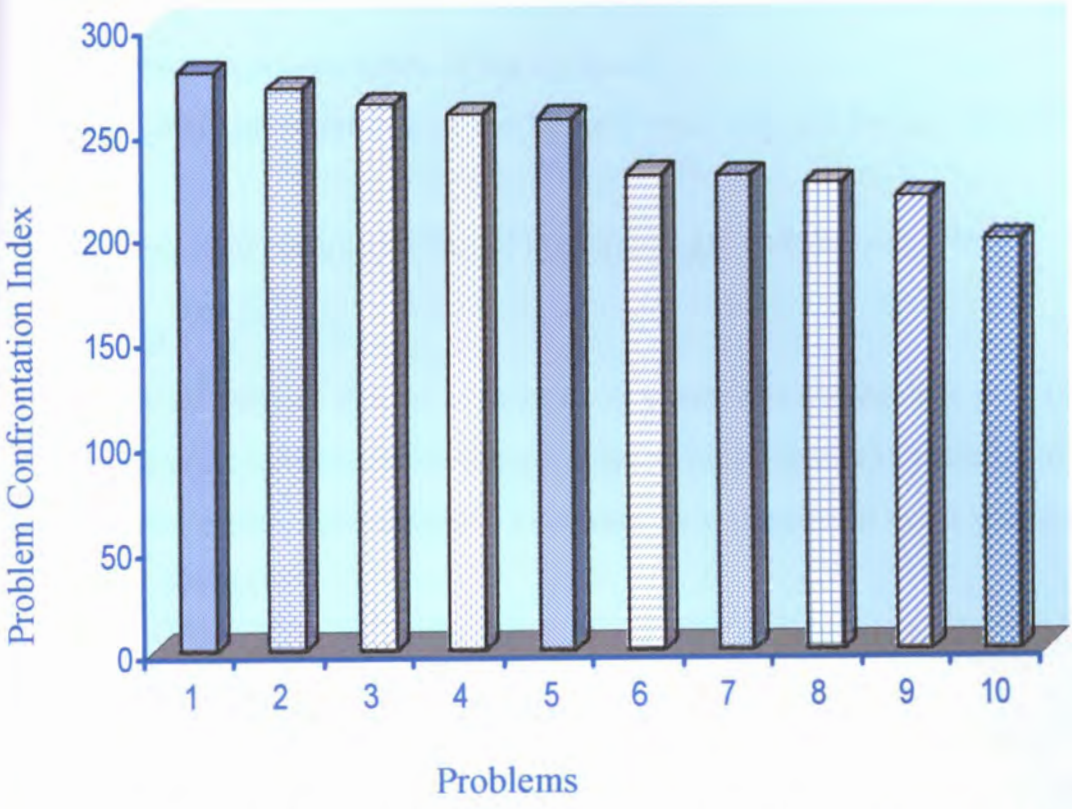


Fig.4.2 Bar graph showing the extent of problem faced by the farmers in brinjal production technologies

1. Scarcity of quality variety of seed, fertilizer and pesticides when they are needed
2. Marketing problem
3. High input cost (seed/seedling, fertilizer, pesticide)
4. Lack of cash money
5. Storage facility
6. Lack of agricultural machineries and tools for improved cultivation
7. Lack of extension advice
8. Lack of technical information
9. Excessive weed infestation
10. Lack of knowledge about proper time of sowing/planting

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the 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 Selected characteristics of the farmers

Ten individual characteristics of the farmers were selected for investigation in this study.

The findings of ten characteristics of the farmers are summarized below:

5.1.1.1Age

The age of the farmers ranged from 26 to 72 years. The average age was 43.79 years with a standard deviation of 8.68. Highest proportions (55 percent) of the farmers were middle aged category as compared to 26 percent being young and 19 percent old aged.

5.1.1.2 Education

Education of the farmers ranged from o to 14. The average score being 3.71 and the standard deviation was 4.15. The highest proportion (56 percent) of the farmers had "Illiterate and can sign only" compared to 16 percent having "primary education", 20 percent having "secondary education" and only 8 percent having "above secondary education".

5.1.1.3 Family size

The family member of the farmers ranged from 2 to 10 with the average of 4.79 and the standard deviation was 1.62. The highest proportion (74 percent) of the farmers had medium family size compared to 13 percent large and 13 percent small family size categories.

5.1.1.4 Farm size

Farm size of the farmers ranged from 0.24 to 2.92 hectares with an average of 0.68 and the standard deviation was 0.44. The highest proportion (81 percent) of the farmers had small farm size compared to 14 percent having medium farm size and 5 percent having marginal farm size.

5.1.1.5 Annual family income

Annual family income scores of the farmers ranged from 14.33 thousand to 192.20 thousand with an average of 71.47 thousand and the standard deviation was 37.11 thousand. The highest proportion (70 percent) of the farmers had medium income compared to 13 percent low income and 17 percent under high income categories.

5.1.1.6 Farming experience

Farming experience of the farmers ranged from 2 to 21 years with an average of 7.35 and the standard deviation was 3.64. The highest proportion (62 percent) of the farmers had medium experienced compared to 22 percent low experienced and 16 percent under high experienced categories.

5.1.1.7 Extension contact

The extension media contact scores of the farmers ranged from 16 to 37 against the possible range of 0 to 39. The average extension media contact score was found to be 26.0 with a standard deviation of 5.0. The highest proportion (65 percent) of the farmers had medium extension contact compared to 18 percent having high and only 17 percent having low extension media contact.

5.1.1.8 Training exposure

Training exposure plays an important role in motivating the farmers in adoption of modern technologies. Training exposure of the farmers range was 0-1. Farmer's response for training his scores was 1and no response for training his scores was 0. The average training was 2.15 and the standard deviation 3.87. Training response was 35 percent compared to having no training response was 65 percent.

5.1.1.9 Organizational participation

Organizational participation scores of the farmers ranged from 0 to 13 against the possible range of 0 to 42 with an average of 4.76 and the standard deviation was 3.66 The highest proportion (33 percent) of the farmers had low participation in organization compared to 29 percent had medium participation, and only 17 percent had high organizational participation categories.

5.1.1.10 Cosmopoliteness

Cosmopoliteness scores of the farmers ranged from 11 to 29, against the possible range was found to be 0 to 30. The average cosmopoliteness scores were found to be 22.72 with a standard deviation of 3.98. The highest proportion (62 percent) of the farmers had medium cosmopoliteness compared to 20 percent having low cosmopoliteness and only 18 percent having high cosmopoliteness.

5.1.2 Adoption of brinjal production technologies

The adoption of brinjal production technologies of the farmers ranged from 28 to 72 against the possible score of 0 to 100. The average adoption was 47.58 with a standard deviation of 11.36. The highest proportion (69 percent) of the farmers had medium adoption categories while 14 percent had high adoption and 17 percent had low adoption of brinjal production technologies.

5.1.3 Relationship between the selected characteristics of the farmers with their adoption of brinjal production technologies

Ten null hypotheses were developed and tested to explore the relationship between ten selected characteristics of the farmers and their adoption of brinjal production technologies. The result of the tested hypotheses were summarized and presented below:

5.1.3.1 Relationship of age with adoption

The age of the farmers had no significant relationship with their adoption of brinjal production technologies even at 0.05 level of probability.

5.1.3.2 Relationship of education with adoption

It was found that the education of the farmers had significant relationship with their adoption of brinjal production technologies even at 0.01 level of probability.

5.1.3.3 Relationship of family size with adoption

The family size of the farmers had significant relationship with their adoption of brinjal production technologies even at 0.05 level of probability.

5.1.3.4 Relationship of farm size with adoption

There was positive and significant relationship between the farm size of the farmers and their adoption of brinjal production technologies at 0.01 level of probability.

5.1.3.5 Relationship of annual family income with adoption

The annual family income of the farmers had positively significant relationship with their adoption of brinjal production technologies at 0.01 level of probability.

5.1.3.6 Relationship of farming experience with adoption

The farming experience of the farmers had positively significant relationship with their adoption of brinjal production technologies at 0.05 level of probability.

5.1.3.7 Relationship of extension media contact with adoption

There was positive and significant relationship between the extension media contact of the farmers and their adoption of brinjal production technologies at 0.05 level of probability.

5.1.3.8 Relationship of training exposure with adoption

There was positive and significant relationship between the training exposure of the farmers and their adoption of brinjal production technologies at 0.01 level of probability.

5.1.3.9 Relationship of organizational participation with adoption

It was found that the organizational participation of the farmers had positive significant relationship with their adoption of brinjal production technologies at 0.05 level of probability.

5.1.3.10 Relationship of cosmopoliteness with adoption

The cosmopoliteness of the farmers had no significant relationship with their adoption of brinjal production technologies at 0.05 level of probability.

5.1.4 Problem faced by the farmers adopting brinjal production technologies

As many as 10 problems as mentioned by the farmers were ranked in order of their importance. The problems were as follows according to ranked order.

1. Scarcity of quality verity of seed, fertilizer and pesticides when they are needed
2. Marketing problem.
3. High input cost (seed/seedling, fertilizer, and pesticide)
4. Lack of cash money
5. Storage facility
6. Lack of agricultural machineries and tools for improved cultivation
7. Lack of extension advice
8. Lack of technical information
9. Excessive weed infestation.
10. Lack of knowledge about proper time of sowing/planting

5.2 CONSLUSIONS

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

1. The adoptions of brinjal production technologies of the farmers were moderate, as nearly 69 percent of the farmers had medium adoption. However, to enhance the rate and extent of adoption of brinjal production technologies among the farmers both the Government Organization and Non-Government Organization workers should provide appropriate technical and management related information to the farmers through continued extension and other support services.

2. The findings indicate that majority (81 percent) of the farmers had young to middle aged and the rest (19 percent) were old aged. Age of the farmers had no significant relationship with their adoption of brinjal production technologies. Therefore, it may be concluded that it is necessary to give special attention to young farmers for adoption of brinjal technologies.

3. Education of the farmers showed that there was significant and positive relationship with their adoption of brinjal production technologies. It influences to adopt brinjal production technologies. They could be motivated to adopt the improved practices due to influence by others. However, education has no alternative.

4. Farm size is an important factor in agriculture. Farm size of the farmers had a significant and a positive relationship with their adoption of brinjal production technologies. In respect of farm size of the farmers it was observed that 95 percent of the farmers had small to medium farms. Considering the above facts, it may be concluded that encourage the farmers having small and medium farms in order to increase their rate of adoption of brinjal production technologies.

5. The farmers having high income can invest appreciable amount of money in their adoption of brinjal production technologies. Annual family income of the farmers showed positive and significant relationship with their adoption of brinjal production technologies. It may be concluded that the availability of money is more essential for the adoption of quality seed, balance fertilizer and IPM (Integrated Pest Management) by the farmers. So government should create interest free credit system for these farmers.

6. Farming experience of the farmers showed positive and significant relationship with their adoption of brinjal production technologies. More experienced farmers are more motivated to adoption of brinjal production technologies.

7. Extension contact of the farmers had a positive significant relationship with their adoption of brinjal production technologies. It can be concluded that any attempt to increase the extension contact of the farmers would be helpful to increase the level of adoption of improved farming practices.

8. Organizational participation of the farmers had significant relationship with their adoption of brinjal production technologies. So encourage the farmers to involve the organization of the community.

5.3 Recommendations

5.3.1 Recommendations for policy implications

On the basis of findings and conclusion of the study the following recommendation were made

I. It may be recommended that agricultural extension agencies especially the DAE and relevant NGOs should critically review their training program and make sound provisions so that the farmers understand the benefit of adoption of brinjal production technologies. The DAE and other NGOs should strengthen their extension services to the farmers to motivate them for adoption of brinjal production technologies.

II. It is recommended that the extension workers should work with the all age group of farmers to promote adoption of brinjal production technologies. However, they will have to work more with comparatively larger member of middle-aged farmers as majority of the farmers belongs to middle-aged group.

III. It may be recommended that special attention should be given by the extension providers to the illiterate farmers and primary educated farmers, so that they become aware about the benefit of adoption of brinjal production technologies.

IV. Farm size of the farmers had positive significant relationship with their adoption of brinjal production technologies. All the farmers had marginal to medium farms and they could give more attention to their farming operation as they generally work on the farm. Hence, extension workers should work with the all category farmers so as to increase the adoption of brinjal production technologies on a high significant scale.

V. Necessary inputs such as quality seed/seedling, chemical fertilizers, insecticides, to be made available to the brinjal growers at proper time and at fair prices.

VI. To ensure proper prices for brinjal, marketing support storage facilities should be ensured.

VII. Extension agencies should realize the existing problems of the brinjal production and take necessary steps to minimize these problems.

5.3.2 Recommendations for further study

The following suggestions are put forward for further research studies.

I. The present study was conducted in two villages of Shampur union in Islampur upazila under Jamalpur district. So, similar studies may be undertaken in other parts of the country to verify the findings of the present study.

II. The present study was conducted based on the ten selected characteristics of the brinjal growers. Further research may be conducted on other characteristics of the brinjal growers.

III. The present study has been carried out among the male farmers only. So, a similar study may be conducted with the farm women to examine their views and opinions regarding the adoption of brinjal production technologies.

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APPENDIX II

Correlation Matrix of the dependent and independent variables

Variables	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
X1	1.00											
X2	-0.177	1.00										
X3	0.545**	-0.86	1.00									
X4	0.110	0.319**	0.214*	1.00								
X5	0.129	0.264**	0.239*	0.587**	1.00							
X6	0.805**	-0.136	0.656**	0.246*	0.255*	1.00						
X7	-0.110	0.148	0.073	0.153	0.291**	-0.035	1.00					
X8	0.116	0.169	0.247*	0.170	0.148	0.300**	-0.020	1.00				
X9	0.70	0.454**	0.078	0.231*	0.262**	0.062	0.056	0.237*	1.00			
X10	-0.131	0.120	-0.252*	0.052	0.065	-0.230*	0.140	-0.383**	-0.235*	1.00		
X11	0.182	0.129	0.324**	-0.023	0.223*	0.280**	0.083	0.404**	0.180	-0.273**	1.00	
X12	0.116	0.340**	0.216*	0.779**	0.629**	0.206*	0.222*	0.275**	0.219*	0.079	0.157	1.00

*Correlation is significant at 0.05 level of probability;
** Correlation is significant at 0.01 level of probability

LEGEND

X_1 = Age
X_2 = Education
X_3 = Family size
X_4 = Farm size
X_5 = Annual family income
X_6 = Farming experience
X_7= Extension contact
X_8= Training exposure
X_9= Organizational participation
X_{10}= Cosmopoliteness
X_{11}= Problems
X_{12}= Adoption of brinjal production technologies

English Version of the Interview Schedule
Department of Agricultural Extension and Information System
Sher-e-Bangla Agricultural University
Dhaka-1207

An Interview schedule on

ADOPTION OF BRINJAL PRODUCTION TECHNOLOGIES BY THE FARMERS OF TWO SELECED VILLAGE OF ISLAMPUR UPAZILA IN JAMALPUR DISTRICT

Name of the respondent: .....
Fathers name: .....
Date.....
Village: .....
Union: .....
Upazila: ....
District.....

SL. .....
No.....

(Please answer the following questions. Confidentiality would be maintain strictly)

1. Age

How old are you? .....years

2. Level of education

Please indicate your educational qualification.

a) Can not read and write .....
b) Can sign only .....
c) Studied up to .....class

3. Family size

How many members are there in your family?
.....persons

4. Farm size

Please give particulars of your farm size as follows

SL. No.	Land area	Total (decimal)	Total (Hectare)
A	Homestead area		
B	Own land under own cultivation		
C	Land taken from others on lease		
D	Land given to others on borga		
E	Land taken from others on borga		
F	Others (fruit garden, pond etc.)		
	Total		

5. Annual family income

Please mention about your annual income from the following sources

Source of income		Total production Kg/Mon	Price per unit Kg or Mon/ha.	Total price (Tk.)
Agriculture	Rice Wheat Maize Sugarcane Oil seeds Pulses Fruits Brinjal Other vegetables Poultry Livestock Fisheries others			
Sub-total				
Non-agriculture	Service Business Day labor others			
Sub-total				
Total				

6. Farming experience

Farming experience .....years

7. Extension contract

Please mention the frequency of communication with the following persons and agriculture related media

Sl. No.	Communication media	Nature of communication media			
		Frequently	**Occasionally**	**Rarely**	**Not at all.**
a. Personal contact					
1.	Sub-asstt. Agri. Officer/ AAEO	4 or more times/ month ( )	3-1 times/ month ( )	3 times/ year ( )	Never ( )
2.	Local leader	4 or more times/ month ( )	3-1 times/ month ( )	3 times / year ( )	Never ( )
3.	NGO workers	4 or more times/ month ( )	3-1 times/ month ( )	3 times/ year ( )	Never ( )
4.	Upazila Agricultural officer/ Agricultural Extension officer	At least 1 time/ month ( )	At least 1 time/2 months ( )	1-5 times/ year ( )	Never ( )
5.	Others (Friends/ Relatives/ Neighbors)	4 or more times/month ( )	1-3 times/ month ( )	3 times/ year ( )	Never ( )
b. Group contact					
6.	Participation in group discussion	4 or more times/ month ( )	2-3 times/ month ( )	1 time/ year ( )	Never ( )
7.	Field day	4 or more times/ month ( )	1-3 times / month ( )	1 times/ year ( )	Never ( )
8.	Result demonstration	4 times/month ( )	1-3 times/ month ( )	3 times/ year ( )	Never ( )
9.	Participation in agril. Training course	3 or more times/year ( )	2 times/year ( )	1 time/ year ( )	Never ( )
c. Mass contact					
10.	Listening Farm Radio Talk	4 or more times/ month ( )	2-3 times/ month ( )	1 time/month ( )	Never ( )
11.	Watching agricultural program in Television	4 or more times / month ( )	2-3 times/ month ( )	1 time/ month ( )	Never ( )
12.	Reading agricultural magazine (Booklet/Leaflet/ Krishi Kotha etc.)	5 or more times/ year ( )	3-4 times/ year ( )	1-2 times/ year ( )	Never ( )
13.	Visiting agricultural fair	3 or more times/year	2 times/year	1 time/year	Never ( )

8. Training exposure

Have you ever participated in agricultural training program? | No | | Yes |

If yes, furnish the following information:

SL. No.	Name of the training course	Offering organization	Day(s)
1.			
2.			
3.			
4.			

9. Organizational participation

Please mention the organization that you are associated with:

SL. No.	Name of organization	Frequency of participation			
		No participation	General member with duration	Executive member with duration	Executive Officer with duration
1.	Union council				
2.	Sporting Club				
3.	Boys Club				
4.	NGO (specify the name)				
5.	School committee				
6.	Madrasa committee				
7.	Others (if any)				

10. Cosmopolitenes

Sl. No.	Place of visit	Extent of visit			
		frequently	Occasionally	Rarely	Not at all
1.	Village other than own village	9 or more times/ month	5-8 times/ month	1-4 times / month	No visit
2.	Visit to relative house	9 or more times/ month	5-8 times/ month	1-4 times / month	No visit
3.	Visit to market	9 or more times/ month	5-8 times/ month	1-4 times / month	No visit
4.	Visit to fair/mela	3 or more times/month	1-2 times/ month	1time/ year	No visit
5.	Visit to other Union	5 or more times/month	3-4 times/ month	1-2 times/ month	No visit
6.	Visit to other Upazilla headquarter	4 or more times/ year	2-3 times/ year	1 time/year	No visit
7.	Visit to other Upazilla town	4 or more times/ year	2-3 times/ year	1 time/year	No visit
8.	Visit to own district town	3 or more times/year	2 times/ year	1 time/ year	No visit
9.	Visit to other District town	3 or more times/year	2 times/year	1 time/year	No visit
10.	Visit to Dhaka capital city or other divisional town	3 or more times/year	2 times/year	1 time/ year	No visit

11. Adoption of brinjal production technologies

SL. No	Name of technologies	2003 - 2004		2004 -2005	
		Net useable land (ha)	Net used land (ha)	Net useable land (ha)	Net used land (ha)
1.	Islampori variety				
2.	Uttara variety				
3.	Transplanting method a) Line sowing b) Haphazard				
4.	Application of recommended dose of fertilizer Urea – 250 kg/ha TSP – 150 kg/ha MP – 125 kg/ha Cowdung14-15 ton/h				
5.	Integrated pest management practice				

12. Problems of Brinjal production

Please mention the extent of problems that you faced during use and application of Brinjal production technologies

SL. No.	Problems	Extent of Problem			
		High	Medium	Low	Not at all
1.	Scarcity of quality variety of seed, fertilizer and pesticides when they are needed				
2.	Excessive weed infestation				
3.	Lack of agricultural machineries and tools for improved cultivation				
4.	High input cost (seed, fertilizer, pesticide)				
5.	Lack of technical information				
6.	Lack of cash money				
7.	Lack of knowledge about proper time of sowing/planting				
8.	Lack of extension advice				
9.	Marketing problem				
10.	storage facility				

Thanks for your participation.

.....
Signature of interviewer

Date.....