

# **FARMERS' KNOWLEDGE AND ATTITUDE TOWARDS SUMMER TOMATO CULTIVATION**

**A Thesis**

**By**

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**MASTER OF SCIENCE IN AGRICULTURAL EXTENSION  
AND INFORMATION SYSTEM**

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SHER-E-BANGLA AGRICULTURAL UNIVERSITY  
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A thesis

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**CERTIFICATE**

This is to certify that the thesis entitled “**Farmers’ Knowledge and Attitude towards Summer Tomato Cultivation**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **Master of Science in Agricultural Extension and Information System**, embodies the result of a piece of bona fide research work carried out by **Nipa Monalesa**, Registration No. **07-02500** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

**Dated:**  
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***DEDICATED***  
***To***  
***MY BELOVED***  
***Parents***

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*The Author*

# CONTENTS

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	<b>PAGE</b>
<b>ACKNOWLEDGEMENT</b>	i
<b>CONTENTS</b>	ii
<b>LIST OF TABLES</b>	v
<b>LIST OF FIGURES</b>	vi
<b>LIST OF APPENDICES</b>	vi
<b>ABSTRACT</b>	vii
<b>CHAPTER 1</b>	
<b>INTRODUCTION</b>	1
1.1    General background	1
1.2    Statement of the problem	3
1.3    Objectives of the study	3
1.4    Justification of the study	3
1.5    Assumptions of the study	4
1.6    Limitations of the study	4
1.7    Definitions of related terms	5
<b>CHAPTER 2</b>	
<b>REVIEW OF LITERATURE</b>	8
2.1    Concept of Knowledge and Attitude	8
2.2    Relationship between selected characteristics of the Farmers and their Knowledge on summer tomato cultivation	13
2.3    Relationship between selected characteristics of the Farmers and their Attitude towards summer tomato cultivation	18
2.4    The Conceptual Framework of the Study	24

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## CONTENTS (Contd.)

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	<b>PAGE</b>
<b>CHAPTER 3</b>	
<b>MATERIALS AND METHODS</b>	26
3.1 Locale of the Study	26
3.2 Population and Sample	29
3.3 Measurement of Variables	30
3.4 Instrument for Data Collection	33
3.5 Collection of Data	34
3.6 Data Processing	34
3.7 Statistical Analysis	34
3.8 Statement of Hypothesis	35
<b>CHAPTER 4</b>	
<b>RESULTS AND DISCUSSION</b>	36
4.1 Selected Characteristics of Summer Tomato Farmers	36
4.1.1 Age	38
4.1.2 Education	38
4.1.3 Land Possession	39
4.1.4 Annual family income	40
4.1.5 Training exposure	41

---

## **CONTENTS (Contd.)**

<b>CHAPTER</b>	<b>PAGE</b>	
4.1.6	Extension contact	42
4.1.7	Tomato cultivation experience	42
4.1.8	Problem faced on summer tomato cultivation	43
4.2	Knowledge of the farmers on summer tomato cultivation	44
4.3	Attitude of the farmers towards summer tomato cultivation	44
4.4	Relationship between the selected characteristics of the farmers with their knowledge and attitude towards summer tomato cultivation	45
<b>CHAPTER 5</b>		
<b>SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS</b>		51
5.1	Summary of Findings	51
5.2	Conclusions	52
5.3	Recommendations	53
5.3.1	Recommendations for policy implication	53
5.3.2	Recommendations for further study	54
 <b>BIBLIOGRAPHY</b>		 56
 <b>APPENDICES</b>		 68



## LIST OF TABLES

TABLE		PAGE
3.1	Distribution of the sampled farmers in the study area	29
4.1	Salient features of the selected characteristics of farmers	37
4.2	Distribution of farmers according to their age	38
4.3	Distribution of farmers according to their education	39
4.4	Distribution of farmers according to their land possession	40
4.5	Distribution of farmers according to their annual family income	40
4.6	Distribution of farmers according to their training exposure	41
4.7	Distribution of farmers according to their extension contact	42
4.8	Distribution of farmers according to their tomato cultivation experience	43
4.9	Distribution of farmers according to their problem faced on summer tomato cultivation	43
4.10	Distribution of farmers according to their knowledge on summer tomato cultivation	44
4.11	Distribution of farmers according to their attitude towards summer tomato cultivation	45
4.12	Co-efficient of correlation (r) of selected characteristics of the summer tomato farmers' with their i) knowledge on summer tomato cultivation and ii) attitude towards summer tomato cultivation	46

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## **LIST OF FIGURES**

---

<b>FIGURES</b>	<b>PAGE</b>
2.1 The conceptual frame work of the study	25
3.1 A map of Jessore district showing Bagherpara upazila	27
3.2 A map of Bagherpara upazilla showing the study area	28

## **LIST OF APPENDICES**

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<b>APPENDICES</b>	<b>PAGE</b>
A English Version of the Interview Schedule	68
B Correlation matrix of the independent and dependent variables	73

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## **ABSTRACT**

The major purpose of this research study was to determine farmers' knowledge and attitude towards summer tomato cultivation and also to explore the relationships between each of eight selected characteristics of the farmers and their knowledge and attitude towards summer tomato cultivation. The study was conducted in 6 villages of Bagherpara upazila under Jessore district. The populations of summer tomato farmers in these villages were 168, from which 101 samples were drawn by using random sampling technique. An interview schedule was used for data collection. The data were collected during 20<sup>th</sup> March to 5<sup>th</sup> April 2015. Appropriate scales were developed in order to measure the variables. With respects knowledge, it was found that the majority (52.4 percent) of the farmers' possessed high knowledge, while 42.6 percent of the farmers possessed medium knowledge and only 5 percent of the farmers had low knowledge on summer tomato cultivation. Regarding attitude, the study showed that about 49.5 percent of the farmers had favourable attitude, while 37.6 percent farmers had unfavourable attitude and 12.9 percent farmers showed neutral attitude towards summer tomato cultivation. Education, land possession, annual family income, extension contact of the farmers had positive significant relationship with farmers' knowledge on summer tomato cultivation, while problem faced had negative relationship with their knowledge. Land possession of the farmers had positive significant relationship with their attitude towards summer tomato cultivation.

# CHAPTAR 1

## INTRODUCTION

### 1.1 General background

Bangladesh is mainly an agro-based country and agriculture plays a vital role in ensuring food security, employment generation, poverty alleviation, and raising standard of living and increasing export earnings. Many developing countries like Bangladesh benefited from the green revolution in cereal production in the past but were not able to substantially reduce poverty and malnutrition. Vegetable production can help farmers to generate income which eventually alleviate poverty. The importance of vegetables in human nutrition is well known. Vegetables are rich and comparatively cheaper source of vitamins and minerals. Their consumption in sufficient quantities provides taste, palatability and increases appetite and provides fair amount of fibers. These are currently reckoned as important adjunct for maintenance of good health and beneficial in protecting against some the degenerative diseases. They also play key role in neutralizing the acids produced during digestion of proteinous and fatty foods and also provide valuable roughage which promotes digestion and helps in preventing constipation.

Among the vegetables tomato is one of the most important vegetables in terms of acreage, production, yield, commercial use and consumption. At present 6.72 percent (BBS, 2011) area is under tomato cultivation both in winter and summer. It is the most consumable vegetable crop after potato and sweet potato occupying the top of the list of canned vegetable (Chowdhury, 1979). It is cultivated all over the country due to its adaptability to wide range of soil and climate (Ahmed, 1976). However, the yield of the crop is very low compared to those obtained in some advanced country ( Sharfuddin and Siddique, 1985). In Bangladesh congenial atmosphere remains for tomato production during low temperature winter season that is early November is the best time for tomato planting in our country (Hossain et al., 1986). It is a good source of vitamin C (31 mg per 100g), vitamin A, calcium, iron etc. (Matin et al., 1996). Although tomato plants can grow under a wide range of climatic conditions, they are extremely sensitive to hot and wet growing

conditions, the weather which prevails in the summer to rainy season in Bangladesh. But limited efforts have been given so far to overcome the high temperature barrier preventing fruit set in summer-rainy (hot-humid) season. Its demand for both domestic and foreign markets has increased manifold due to its excellent nutritional and processing qualities (Hossain et. al, 1999).

Considering the growing demand and importance of tomato, Bangladesh Agricultural Research Institute (BARI) has taken initiative to develop off-season summer and rainy season tomatoes. So far BARI has developed and released 3 hybrid tomato varieties i.e. BARI hybrid tomato-3 , BARI hybrid tomato-4 and BARI hybrid tomato-8 which can be grown during summer and rainy season under polytunnel. But, in Bangladesh very little information has so far been generated regarding the profitability and adoption of hybrid tomato cultivation technologies by the farmers in the country. Generalization from studies conducted by home and abroad regarding the tomato production may not be always applicable due to considerable variation in attributes of the technologies and for various others factors ( Mohiuddin et al., 2007; Zaman et al., 2006; Islam, 2005; Rahman et al., 1998; Ali and Gupta, 1978; Gupta and Rao, 1978). Fortunately, the farmers of Bagherpara upazila under Jessore district started to adopt this technology as a pioneer farmer since 2005. It is recognized that in order to expand the area of this crop as well as to fit this crop in the farmers cropping system, studies are needed to ascertain its cost and return situation in relation to profitability, input use and farmer's resource use efficiency.

Yet, no or little systematic knowledge and attitude towards summer tomato cultivation study has so far been conducted. Majority of the respondents conducted studies for their own requirements and very few common studies could be found, which is not enough to assess the overall farmers' knowledge and attitude towards summer tomato cultivation.

## **1.2 Statement of the Problem**

In view of the above background and facts, the present study was undertaken with the title “Farmers’ Knowledge and Attitude towards Summer Tomato Cultivation”. The study aimed at providing information regarding the following queries:

- i. What is the extent of knowledge of farmers in summer tomato cultivation?
- ii. What is the attitude of farmers towards summer tomato cultivation?
- iii. Is there any relationship between farmers’ selected characteristics and their knowledge and attitude towards summer tomato cultivation?

## **1.3 Specific Objectives**

- 1) To determine and describe the following selected characteristics of the farmers:
  - a) Age
  - b) Education
  - c) Land possession
  - d) Annual family income
  - e) Training exposure
  - f) Extension contact
  - g) Tomato cultivation experience
  - h) Problem faced on summer tomato cultivation
- 2) To assess the extent of farmers’ knowledge on summer tomato cultivation
- 3) To assess the attitude of farmers’ towards summer tomato cultivation
- 4) To explore the relationship of the selected characteristics of the farmers’ with their i) knowledge and ii) attitude towards summer tomato cultivation

## **1.4 Justification of the Study**

The major focus of the study is to assess the knowledge and attitude of the farmers towards summer tomato cultivation. Now a days, BARI has released different summer tomato varieties. Government also non-government organizations are currently putting effort and

allocating resources for production oriented research and also encouraging the rural people to undertake summer tomato cultivation. So, evaluation of knowledge and attitude of the concerned farmers is necessary.

Considering the above findings, the researcher became interested to undertake a study to determine knowledge and attitude of the farmers towards summer tomato cultivation.

### **1.5 Assumption of the Study**

The researcher had the following assumptions in mind while undertaking this study:

1. The selected respondents were competent enough to reply the queries made by the researcher.
2. The responses furnished by the respondents were valid and reliable.
3. Information furnished by the respondents included in the sample was the representative opinion of the whole population of the study area.
4. The researcher who acted as interviewer was well adjusted to social and environment condition of the study area. Hence, the data collected by her from the respondents were free from bias.
5. All the data concerning the variables of the study were normally and independently distributed.

### **1.5 Limitation of the Study**

In order to make the study manageable and meaningful from the point of view of research, it was necessary to impose some limitations as stated below:

1. The study was confined to two selected union of Bagherpara upazila under Jessore district.
2. The characteristics of tomato farmers in the study area were many and varied but only eight characteristics were selected for investigation in this study as stated in the objectives.

3. The researcher relied on the data furnished by the tomato farmers' from their memory during interview.
4. For some cases, the researcher faced unexpected interference from the over interested side-talkers while collecting data from the target populations. However, the researcher tried to overcome the problem as far as possible with sufficient tact and skill.
5. Reluctance of tomato farmers to provide information was overcome by establishing proper rapport.
6. Various problems in summer tomato cultivations are likely to be faced by the farmers. However, only seven problems have been considered for investigation in this study.

### **1.7 Definition of Related Terms**

The terms which have been frequently used throughout the research work are defined and interpreted below:

#### **Age**

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

#### **Education**

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

#### **Land possession**

Land possession referred to the cultivated area either owned by the farmer or obtained from others on barga system, the area being estimated in terms of full benefit and half



benefit to the farmer respectively. The self cultivated owned land and cultivated area taken as lease or mortgage from others was recognized as full benefit.

### **Annual family income**

The term annual family income referred to the total earning by the earning members from agriculture, livestock, fisheries and other accessible sources (business, service, daily labor etc.) during a year. It was expressed in Thousand Taka.

### **Training exposure**

It was used to refer to the completion of an activity by the farmers which were offered by the government, semi-govt. or non-government organization (s) to improve the knowledge and skills of farmers for better performing an agricultural job. It was measured by the number of days of training received by the respondent.

### **Extension contact**

It referred to an individual's (farmer) exposure to or contact with different communication media, source and personalities being used for dissemination of new technologies.

### **Tomato cultivation experience**

Tomato cultivation experience referred to the total duration attained by a respondent on tomato cultivation and it was expressed as total number of years.

### **Problem faced on summer tomato cultivation**

Problem referred to a difficult situation about which something to be done. It referred to the extent of problems faced by a respondent in summer tomato cultivation in terms of social, technical, economical, marketing and psychological problems.

### **Knowledge on summer tomato cultivation**

It referred to the extent of basic understanding of the farmers in different aspects of summer tomato cultivation i.e. varieties, soil condition, seed rate, suitable time for cultivation, Urea, TSP, MP, diseases, insects, fungicides, harvesting time etc.

### **Attitude towards summer tomato cultivation**

Attitude is the mental predisposition of an individual to act in a particular way. In other words, it refers to one's favourable or unfavourable feelings, beliefs, and actions towards

an object and concept. Attitude towards summer tomato cultivation, refers to one's feeling towards the cultivation of summer tomato in various aspects of agricultural development to meet the demand of tomato at all around the year.

## **CHAPTER 2**

### **REVIEW OF LITERATURE**

In this chapter, reviews of the literature related to the study are presented. The researcher intensively searched internet, websites, available books, journals and printed materials from different sources of home and abroad. It may be relevant here to mention that a good number of research activities concerning farmers' knowledge and attitude have been made in many countries of the world. The researcher also reviewed the theses containing in the digital agricultural theses archival web portal of Bangladesh established by Ali (2012).

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

- First section : Concept of Knowledge and Attitude
- Second section : Relationships between Selected Characteristics of the Farmers and Their Knowledge on summer tomato cultivation
- Third section : Relationships between Selected Characteristics of the Farmers and Their Attitude towards summer tomato cultivation
- Fourth section : The Conceptual Framework of the Study

#### **2.1 Concept of Knowledge and Attitude**

Bhuiyan (2012) indicated that "Knowledge may be defined as the scientific fact of an idea which is experimentally or empirically verified."

Boudreau (1995) indicated "Human faculty resulting from interpreted information; understanding that germinates from combination of data, information, experience, and individual interpretation. Variously defined as, Things that are held to be true in a given context and that drive us to action if there were no impediments."

According to Wikipedia “Knowledge is a familiarity, awareness or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning. It can refer to a theoretical or practical understanding of a subject. It can be implicit (as with practical skill or expertise) or explicit (as with the theoretical understanding of a subject); it can be more or less formal or systematic.”

According to Oxford dictionary “facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.”

Thurstone (1928) defined attitude as the effect for or against a psychological object.

According to Morgan, Holmes and Bundy (1929) attitude means one's feeling towards persons, ideas, institution, practices of facts.

Warren (1934) refers to attitude as a specific mental disposition towards an incoming or arising experience, whereby that experience is modified, or in other words, it is a condition of readiness for a certain type activity.

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

Green (1954) distinguished three kinds of attitude universe to represent three different classes of individual responses to sets of social objects. These are : i) verbal attitudes, given in response to question, ii) spontaneous verbal attitude, usually expressed in normal conversation and iii) action attitudes which include

both verbal and non-verbal behaviour directed towards and object in the referent class.

Sherif and Sherif (1956) defined the term attitude as a relatively stable tendency to respond with a positive or negative affect to a specific referent.

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

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

Doob (1948) stated that attitude affects behaviour since an implicit, drive producing response considered socially significant in the individual society. If this definition is broken down typographically into phases and clauses, an attitude implies the following.

- i. It is an implicit response.
- ii. It is both (a) anticipatory and (b) mediating reference to patterns of covert responses.
- iii. It is evoked by (a) a variety of stimulus patterns (b) as a result of previous learning, or of gradients of generalization and discrimination.
- iv. It is itself a cue and drive producing.
- v. It is considered socially significant in the individual's society.

According to Allport (1935), an attitude is that disposition to act which is built up by the integration of numerous specific responses of similar type, but which exists as a general neutral set when activated by a specific stimulus, it results in behaviour that is more obviously a function of the disposition than of the

stimulus. According to Allport, the chief weakness of the most of the definition lies in their failure to distinguish between attitudes, which are often very general, and habits, which are limited in their scope. However, it is justified to admit that, in spite of existence of disagreements among psychologists, they contributed towards securing greater agreement in future.

Azad (2005) determined the impacts of Mymensingh Aquaculture Extension Project (MAEP) in relation to farmers' gain in knowledge, skill development and change of attitude on culture and management of fish ponds in Melandaha and Islampur upazilla under Jamalpur district. The personal characteristics of the fish farmers such as education, experience, training and organizational contact were positively correlated with farmers' acceptance of aquaculture training provided by MAEP was effective in enhancement and development of farmers' knowledge, skill and attitude on fish production under semi-intensive system of culture and management. After training, fish production of trained farmers was increased by 84percent over their initial production of 6.83 kg/dec/yr. Fish production of the trained farmers increased to a level of 10.0-18.0 kg/dec/yr averaging 12.55 kg/dec/yr. The selected farmers had favorable attitude towards semi-intensive aquaculture.

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

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

Hassan (2004) reported that the highest proportion of the respondents had medium knowledge on partnership extension approach (70.4 percent) followed by 16.9 percent had low knowledge an 13.3 percent had high knowledge.

Rahman (2004) found in his study that the highest proportion (62.22 percent) of the respondents had medium knowledge compared to 25.56 percent having low knowledge and only 12.22 percent had high knowledge on HYV boro rice cultivation practices.

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

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

Khan (1996) conducted a research on the effectiveness of a farmer primer on growing rice in knowledge change of the farmers in Shaktipur Thana and found that 67 percent farmers had good knowledge at initial stage, where 21 percent had excellent knowledge and 12 percent had poor knowledge.

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

Abolagba (2006) showed that a higher percentage of the farmers (42.1% and 36.8%) were hobby and part time farmers and the average age of the farmers was 47 years. About 94.7% of the farmers feed their fish using locally available feed ingredients; 89.5% and 26.3% of the farmers use poultry dropping and single super phosphate fertilizers, respectively to fertilize their ponds while 63.2% do not lime their ponds. The pond management practices were and can be generally considered as fair.

Akankali *et al.* (2011) showed in their articles reviews the fish pond management processes, stocking of ponds, feeding of fish, types of culture, fish farming combined with other branches of agriculture, rearing of fish for purposes other than food, other fish culture, types of fish used for fish culture in central east Africa, general biology of the species of

value in fish culture and suitable combinations of fish for stocking to reawaken the minds of individuals, companies and government on the need to develop pond fish culture in Nigeria.

## **2.2 Relationship between selected characteristics of the Farmers and their Knowledge on summer tomato cultivation**

### **2.2.1 Age and knowledge**

Amin (2001) observed in his study that age of PETRRA and non-PETRRA beneficiaries had negative significant relationship with their knowledge on organic cocoon and skills on production, processing, storing of seeds.

Hanif (2000) observed in his study that age of FFs farmers had significant relationship with IPM knowledge on environmental awareness.

Hossain (2003) observed in his study that the age of farmers had no significant relationship on modern Boro rice cultivation practices.

Huda *et al.* (1992) found that older farmers were more careful in keeping moisture content low of their seed.

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

Islam (1996) conducted a study on farmers' use of indigenous technical knowledge (ITK) in the context of sustainable agricultural development. He found that age of the farmers had significant negative relationship with their extent of use of ITK.

Kashem (1987) in his study on the small farmers constraints to the adoption of modern rice technology found that age of the farmers had significant negative correlation with their agricultural knowledge. This men that generally younger farmers gained more agricultural knowledge than their older counterpart.



Rahman *et al.* (1988), Chandargi (1980) found positive significant relationship between age and knowledge in their research.

Rayapradhy and Jayaramaiah (1989) worked on Village Extensions Officer's (VEOs) knowledge of rice production technology, and found that age of the VEOs showed negative relationship with the knowledge level of VEOs.

Saha (2003), Sana (2003), Sarker (2002), Saha (2001), Rahman (2001), Hossain (2000), Islam (1993), found no relationship between age and knowledge in their studies.

### **2.2.2 Education and knowledge**

Saha (2003), Sana (2003), Sarker (2002), Saha (2001), Hossain (2000) found that education of the farmers was positively and significantly related with their knowledge in their research work.

Islam (1993) found that the general education of the BSs had no significant relationship with their knowledge on modern agricultural technologies.

Sharma and Sonoria (1983) found no significant differences of education between that contact and non-contact farmers. But they found significant differences in knowledge of both contact and non-contact farmers with their education. However, adoption of innovations varied significantly with the education in case of non-contact farmers only.

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

Huda *et al.* (1992) found that farmers with education and without education had same level of moisture of their seed.

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

Amin (2001) found that education of PETRRA and non-PETRRA beneficiaries had positive significant relationship with their knowledge on organic cocoon and skills on production and storing of rice seeds.

Huda (2001) reported that of education level of the farmers have motivated them to dry the seed and keep in sealed container to keep the moisture low.

Hossain (2003) found that education of the farmers had significant relationship with modern Boro rice cultivation.

### **2.2.3 Land possession and knowledge**

Sana (2003), Hossain (2000) found that farm size of the farmers had no relationship with their knowledge. Sharma and Sanoria (1983) found that no significant differences in knowledge of both the contact and non-contact farmers with their operational holding size.

Sarker (2002), Hossain (2001) found that there was a positive relationship between farm size of the farmers and their knowledge in their research.

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

Islam (1996) found that there was significant and negative relationship between the farm size of the farmers and their extent of use of indigenous technical knowledge.

Alam (1997) studied the use of improved farm practices farm in rice cultivation by the farmers. The findings of the study showed that the farm size had a significant relationship with their use of improved farm practices in rice cultivation. Similar results were found by Verma and Kumar (1991).

Amin (2001) found that farm size of PETRRA and non-PETRRA beneficiaries had no relationship with knowledge on organic cocoon and skills on production, procession and storing of rice seed.

Hossain (2003) reported that farm size of the farmers had significant relationship with modern Boro rice cultivation.

#### **2.2.4 Annual family income and knowledge**

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

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

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

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

Islam (1996) found that there was significant and negative relationship between the farm size of the farmers and their extent of use of indigenous technical knowledge.

Alam (1997) studied the use of improved farm practices farm in rice cultivation by the farmers. The findings of the study showed that the farm size had a significant relationship with their use of improved farm practices in rice cultivation. Similar results were found by Verma and Kumar (1991).

Amin (2001) found that farm size of PETRRA and non-PETRRA beneficiaries had no relationship with knowledge on organic cocoon and skills on production, procession and storing of rice seed.

Hossain (2003) reported that farm size of the farmers had significant relationship with modern Boro rice cultivation.

### **2.2.5 Training exposure and knowledge**

Planty (1998) found that training exposure of the farmers had a positive significant relationship with their knowledge.

Manjunatha (1980) found that training exposure of the farmers had a positive significant relationship with their knowledge.

### **2.2.6 Extension contact and knowledge**

Sana (2003), Sarker (2002) and Rahman (2001) found in their study that media exposure of farmers were highly positive significant relationships with their knowledge.

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

### **2.2.7 Tomato cultivation experience and knowledge**

Rayaparaddy and Jayaranaiah (1989) found that experience of the farmers had a positive significant relationship with their knowledge.

Setty (1973) found that experience of the farmers had no relationship with their knowledge.

### **2.2.8 Problem faced on summer tomato cultivation and knowledge**

Ali (1999) concluded that problems of the farmers had a significant relationship with their knowledge.

Raha (1989) concluded that problems of the farmers had no significant relationship with their knowledge.

Anwar (1994) concluded that problems of the farmers had no significant relationship with their knowledge.

## **2.3 Relationship between selected characteristics of the Farmers and their Attitude towards summer tomato cultivation**

### **2.3.1 Age and attitude**

Chowdhury (2003), Sarker (2002) found in their study that there is no relationship between age and attitude.

Kashem (1987) in his study also found that there was no relationship between the age and attitude towards community of the farmers.

Ali (2002), Singh and Kunzroo (1985) found that age of the farmers had negative significant relationship with their attitude in their research studies.

Mannan (2001), Parveen (1993), Verma and Kumar (1991) found that age of the respondents had positive relationship with their attitude towards ecological agriculture.

Singh (1982) observed that attitude of irrigated and non-irrigated groups of farmers towards improved crop production technology were heavily skewed into favourable category. However, the differences between mean attitude scores of the two groups of farmers were significant and were in favour of farmers who had irrigated farm holdings.

Singh and Kunzroo (1985) found that there was a negatively significant relationship between age of the farmers and their attitude towards goat and sheep farming.

Verma and Kumar (1991) conducted a study on comparison of farmer's attitude towards buffalo management practice in adopted and non-adopted villages revealed

that there was relationship between age and attitude towards buffalo management in case of adopted village and they found no significant relationship between age and attitude of the farmers of non-adopted village.

Parveen (1993) found that age of the modern village women influenced their attitude towards homestead agricultural production. But in case of the women of the traditional village, age was not associated with their attitude towards homestead agriculture production.

Noor (1995) found that age of the relationship with their attitude towards the cultivation of high yielding varieties of potato.

Islam and Kashem (1997) observed that age of the farmers had negative relationship with their attitude towards agrochemical.

Habib (2000) found that age of the BSs had no significant relationship with their attitude towards the use of agro-chemicals.

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

Bari (2000) reported in his study that age of the farmers had no significant relationship with their attitude towards hybrid rice AALOK 6201.

Paul (2000) found that there was negatively significant relationship between age of the farmers and their attitude towards the use of USG.

Mannan (2001) found that age of Proshika farmers had no significant relationship with their attitude towards the Ecological Agricultural Programmes.

Chowdhury (2003) found that age of farmers' had no significant relationship with their attitude towards crop diversification.

### **2.3.2 Education and attitude**

Chowdhury (2003), Shehrawat (2002), Khan (2002), Kumari (1988), Sulakshna (1988) and Kashem (1987) found that education of the farmers had a positive significant relationship with their attitude.

Rogers and Leuthold (1962) in their study on farm demonstration found that the farmer demonstrators, who were characterized by more years of formal education, were characterized by more favourable attitudes towards fertilizer.

Ali (2002) found that education qualification of Block Supervisor's had negative relationship with their attitude.

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

Singh and Kunzroo's (1985) study revealed that there was a positive and significant relationship between education of farmers and attitude towards sheep and farming.

Kashem (1987) found that attitude towards community of the small farmers had significant positive correlation with their educational level.

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

Sulakshna (1988) found that the educational qualification of the extension personnel was positively related with their attitude towards extension work.

Verma and Kumar (1991) reported that there was positive and significant relationship between education of farmers and their attitudes towards buffalo

management in non-adopted village but the relationship was not significant in adopted village.

Noor (1995) in his study found that education of the farmers had positive significant relationship with their attitude towards HYV of potato.

Habib (2000) observed in his study that education of the BSs had significant positive relationship with their attitude towards agro-chemicals.

Nurzaman (2000) found that education of the FFS and non-FFS farmers were positively correlated with their attitude on IPM.

Paul (2000) in his study found that academic qualification of the farmers had positive significant relationship with their attitude towards the use of USG.

Mannan (2001) found that academic qualification of Proshika farmers had a positive relationship with their attitude towards the Ecological Agricultural Programme.

Chowdhury (2003) found that academic qualification of the farmers had positive significant relationship with their attitude towards crop diversification.

Sadat (2002) and Haque (2002) found similar relationship towards age and attitude of farmers'.

### **2.3.3 Land possession and attitude**

Chowdhury (2003), Shehrawat *et al.* (2002) and Sadat (2002) found that there was a positive and significant relationship between farm size and attitude of farmers in their studies.

Verma and Kumer (1991) and Karim *et al.* (1987) also found that there was positive and significant relationship between farm size and attitude of farmers.



Ali (2002), Nurzaman (2000) and Noor (1995) revealed in their studies that farm size had no significant relationship with the attitude.

Habib (2000) observed in his study that family size of the BSs had no relationship with their attitude towards the use of agrochemicals.

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

Noor (1995) observed in his study that farm size of the farmers had no significant relationship with their cultivation of HYV of potato.

Nurzaman (2000) observed in his study that farm size of the FFS and non-FFS farmers had no significant relationship with their attitude on IPM.

Paul (2000) also observed in his study that there was positive and significant relationship between farm size and attitude of farmers towards the use of USG on rice cultivation.

Mannan (2001) found that the farm size of Proshika farmers had positive significant relationship with their attitude towards the Ecological Agriculture Programmes.

#### **2.3.4 Annual family income and attitude**

Chowdhury (2003), Shehrawat (2002), Puttaswamy (1977) and Das (1963) reported that family income of farmers had positive significant relationship with their attitude.

Siddique (2002), Nurzaman (2000) and Parveen (1993) revealed that annual income had no significant relationship with the attitude of farmers in their studies.

Kashem (1987) also found that income of the small farmers had no significant relationship with their attitude towards community of the farmers.

Habib (2000) observed in his study that income of the BSs has significant negative relationship with their attitude towards agro-chemicals.

Karim *et al.* (1987) revealed that income of the farmers had significant and positive relationship with their attitude towards the use of urea.

Nurzaman (2000) observed in his study that there was no significant relationship between family income of the FFS and non-FFS farmers with their attitude on IPM.

Paul (2000) reported that annual family income of the farmers had positively significant relationship with their attitude towards use of USG.

Bari (2000) found that there was significant negative relationship between family income and attitude of farmers towards hybrid rice AALOK 6201.

Mannan (2001) observed in his study that there was positive significant relationship between the family annual income and their attitude towards the Ecological Agriculture Programmes.

Akanda (2001) found significant relationship with income and attitude towards rice fish programme CARE in Muktagacha upazila of Mymensingh district.

### **2.3.5 Training exposure and attitude**

Paul (2000) reported that training exposure of the farmers had a positive significant relationship with their attitude.

Bari (2001) reported that training exposure of the farmers had no relationship with their attitude.

### **2.3.6 Extension contact and attitude**

Ajore (1989) and Vidyashanker (1987) also observed in their study that mass media exposure had a significant relationship with their attitude towards chemical fertilizer.

Bari (2000) also reported that there is no relationship between extension media contact and attitude of farmers towards hybrid rice ALOK 6201.

Chowdhury (2003) observed no relationship between extension media contact and attitude of farmers towards crop diversification.

Shehrawat (2002), Sadat (2002) and Siddique (2002) reported in their studies that there was a significant and positive relationship between extension contact and attitude of farmers.

### **2.3.7 Tomato cultivation experience and attitude**

Habib (2000) reported that experience of the farmers had a positive significant relationship with their attitude.

Sarker (2002) reported that experience of the farmers had a positive significant relationship with their attitude.

### **2.3.8 Problem faced on summer tomato cultivation and attitude**

Karim et al.(1997) found that problems of the farmers had a significant relationship with their attitude.

Muttaleb et al.(1998) revealed that problems of the farmers had a significant relationship with their attitude.

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

This study is concerned with the farmers' knowledge and attitude towards summer tomato cultivation. Thus the knowledge and attitude were the main focus of the study and 8 selected characteristics of the farmers' were considered as those might have relationship with knowledge and attitude. Farmers' knowledge and attitude towards summer tomato cultivation may be influenced and affected through interacting forces of many independent factors. It is not possible to deal with all the factors in a single study. Therefore, it was necessary to limit the factors, which included age, education, land possession, annual family income, training exposure, problem faced in summer tomato cultivation, tomato

cultivation experience and extension contact for summer tomato cultivation information. The conceptual framework of the study has been presented in Fig. 2.1

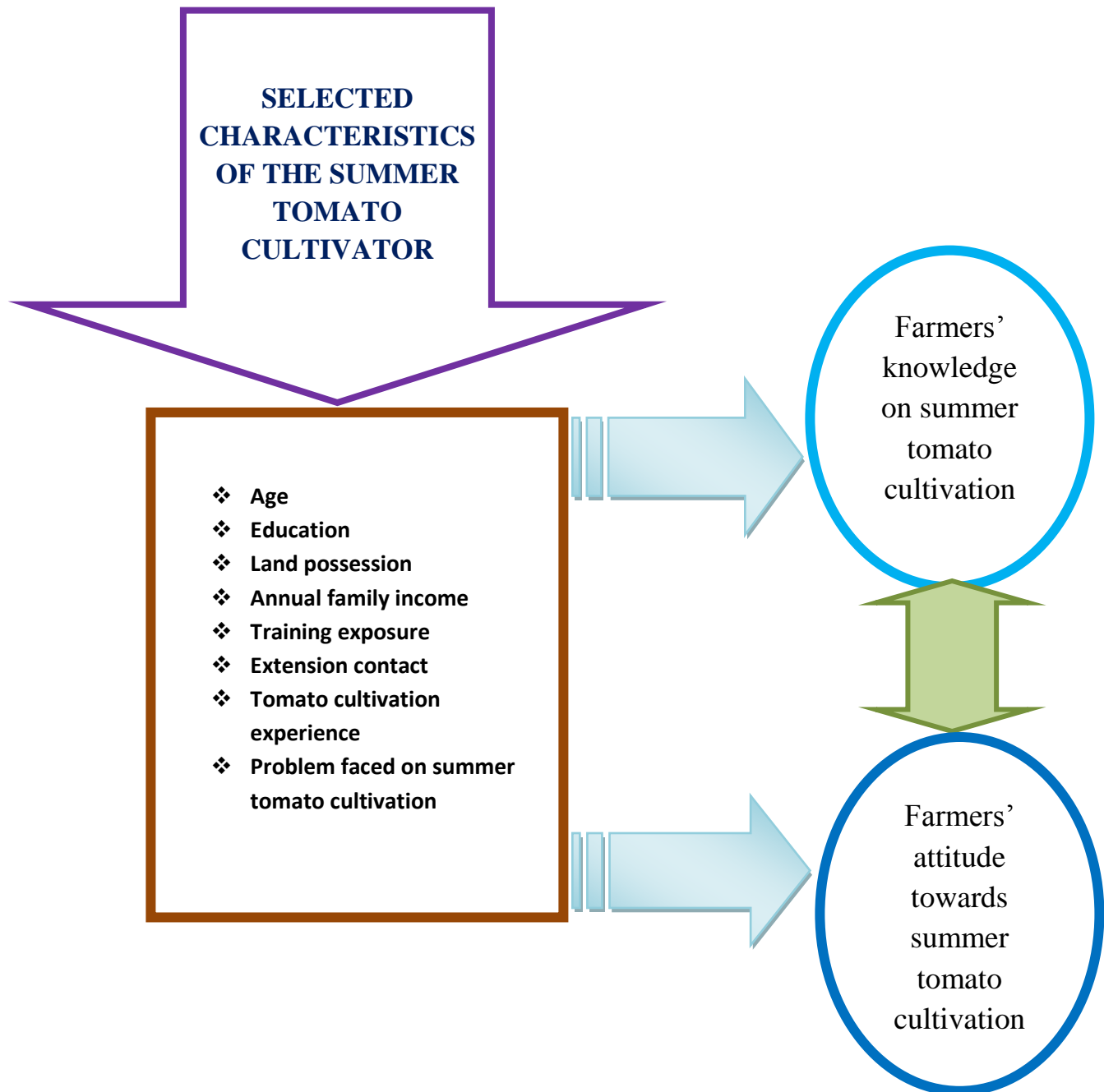


Fig. 2.1 The conceptual framework of the study

## **CHAPTER 3**

### **MATERIALS AND METHODS**

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

#### **3.1 The Locale of the Study**

The study was purposively conducted at Bagherpara upazilla under Jessore district. Two unions namely Basuari and Darajhat were also purposively selected. All tomato growers from the selected villages and six villages were constituted as the population of the study. The selected villages were Koikhali, Debinagar, Daatpur, Rustompur, Laxmipur, Bolorampur. A map of Jessore district showing Bagherpara upazila is presented in Figure 3.1. A map of Bagherpara upazila showing the study area is presented in Figure 3.2.

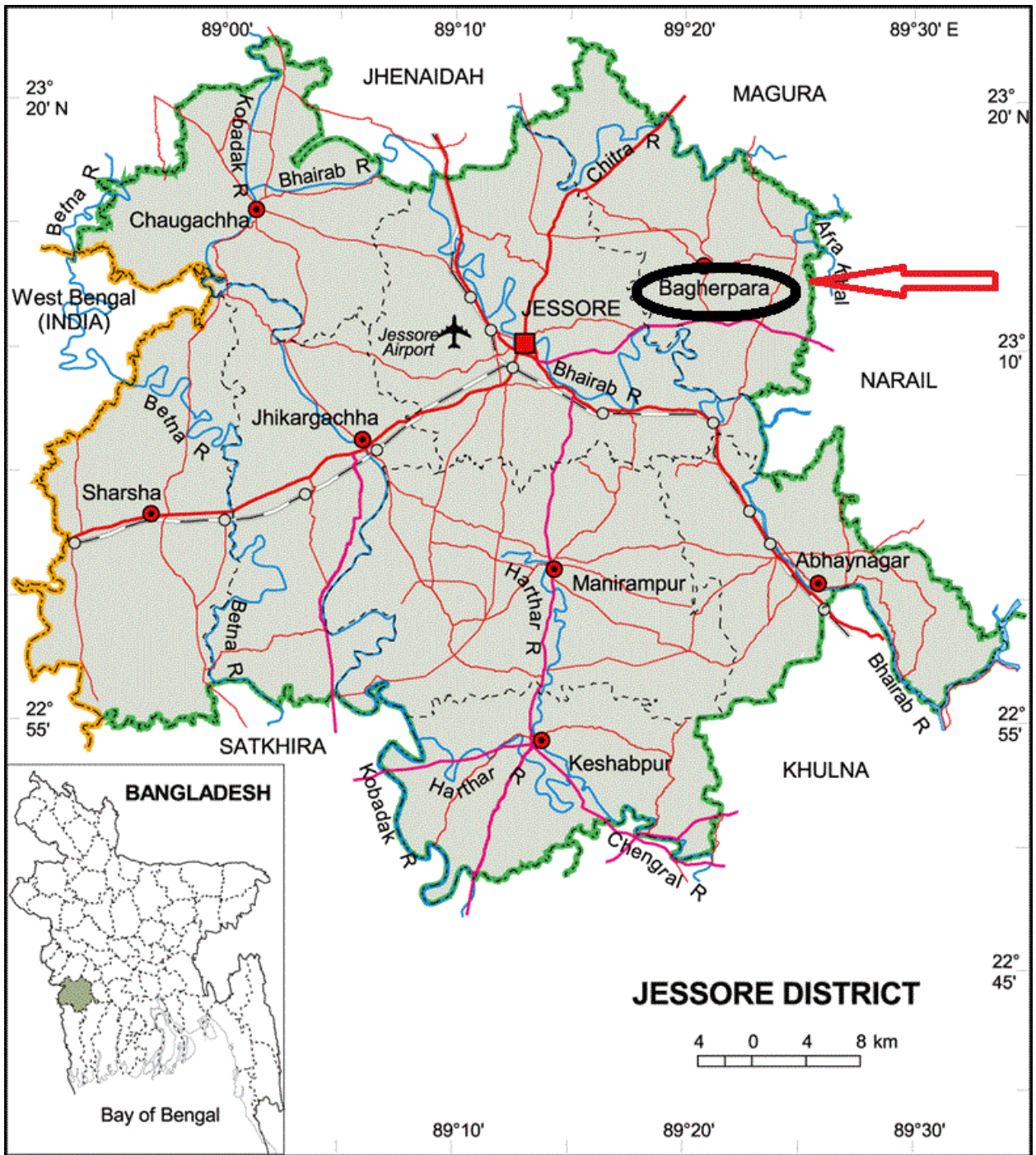


Figure 3.1: A map of Jessore district showing Bagherpara upazila



Figure 3.2: A map of Bagherpara upazilla showing the study area

### 3.2 Population and Sample

The summer tomato farmers under selected six villages were considered as the population of the study. A list of summer tomato farmers who are currently cultivating tomato was prepared with the help of Upazila Agriculture Officer and his field staffs. The number of summer tomato farmers of the selected six villages was 168 which constituted the population of the study. About 60 percent of the population was selected proportionally from the selected villages as the sample by following random sampling method. Thus, the total sample size stood at 101. Moreover, a reserved list of 17 summer tomato farmers was prepared for use when the summer tomato farmers under sample were not available during data collection.

The distribution of the selected summer tomato farmers with reserve list of the selected villages is shown in the table 3.1.

**Table 3.1 Distribution of the sampled farmers in the study area**

<b>Name of village</b>	<b>Total no. of summer tomato farmers</b>	<b>Sample</b>	<b>Reserve list</b>
Debinagar	20	12	2
Daatpur	20	12	2
Bolorampur	75	45	8
Laxmipur	32	20	3
Koikhali	7	4	1
Rustompur	14	8	1
<b>Total</b>	<b>168</b>	<b>101</b>	<b>17</b>



### **3.3 Measurement of Variables**

The various characteristics of the summer tomato farmers might have influence on their knowledge and attitude towards summer tomato cultivation. These characteristics were age, education, land possession, annual family income, training exposure, extension contact, tomato cultivation experience and problem faced.

The knowledge and attitude of summer tomato farmers towards summer tomato cultivation were the main focus of the study.

Measurement of all the factors of the summer tomato farmers and their knowledge and attitude towards summer tomato cultivation are discussed in the following sub sections:

#### **3.3.1 Age**

The age of a summer tomato farmers was measured by counting the actual years from his/her birth to the time of interview. It was expressed in terms of complete years.

#### **3.3.2 Education**

The education of a summer tomato farmers was measured by the number of years of schooling completed in an educational institution. A score of one (1) was given for each year of schooling completed. If a summer tomato farmers didn't know how to read and write, his education score was zero, while a score of 0.5 was given to a summer tomato farmers who could sign his name only. If a summer tomato farmer did not go to school but studied at home or adult learning center, his knowledge status was considered as the equivalent to a formal school student.

#### **3.3.3 Land possession**

The land possession of a summer tomato farmer referred to the total area of land on which his/her family carried out farming operations, the area being in terms of full benefit to his/her family.

The land possession was measured in hectares for each summer tomato farmers using the following formula:

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

Where,

LP= Land possession

A<sub>1</sub> = Homestead area

A<sub>2</sub>= Own land under own cultivation

A<sub>3</sub>= Land given to others on borga

A<sub>4</sub>= Land taken from others on borga

A<sub>5</sub>= Land taken from others on lease

### **3.3.4 Annual family income**

Annual family income of a summer tomato farmers was measured in Thousand Taka. The total yearly earning from agricultural (field crops, vegetables, fruits, spices, livestock and fisheries) and nonagricultural sources (service, business, and others) by the respondent himself/herself and other members of his family was determined. Thus, yearly earning from agricultural and nonagricultural sources were added together to obtain annual family income of a summer tomato farmers. A score of one was given for each Tk. 1,000 to compute the annual income scores of the respondents.

### **3.3.5 Training exposure**

Training exposure of a summer tomato farmer was measured by the total number of days he/she participated in different training programmes. A score of one (1) was assigned for each day of training received.

### **3.3.6 Extension contact**

This variable was measured by computing an extension contact score on the basis of a respondent's extent of contact with 8 selected media as obtained in response to item no.6 of the interview schedule (Appendix A). Each respondent was asked to indicate the

frequency of his contact with each of the selected media.

With four alternative responses as ‘regularly’, ‘occasionally’, ‘rarely’ and ‘never’ basis and weights were assigned as 3, 2, 1 and 0 respectively.

The extension contact score of a respondent was determined by summing up his/her scores for contact with all the selected media. Thus possible extension contact score could vary from zero (0) to 24, where Zero indicated no extension contact and 24 indicated the highest level of extension contact.

### **3.3.7 Tomato cultivation experience**

Tomato cultivation experience of a summer tomato farmer was measured by the total number of years he/she cultivated summer tomato. A score of one (1) was assigned for each year of cultivation.

### **3.3.8 Problem faced in summer tomato cultivation**

This variable was measured by computing the extent of various problems of the respondents with 7 selected problems as obtained in response to item no. 8 of the interview schedule (Appendix A). Each respondent was asked to indicate the extent of his/her problem as severe problem, moderate problem, low problem and not at all problem and score was assigned as 3, 2, 1 and 0 respectively.

The problem faced score of a respondent was determined by summing up his/her scores for all the problems. Thus, possible score could vary from zero (0) to 21, where Zero indicated no problem and 21 indicated the highest level of problem.

### **3.3.9 Knowledge on summer tomato cultivation**

After thorough consultation with relevant experts and reviewing of related literature, 13 question regarding summer tomato cultivation were selected and those were asked to the respondent summer tomato farmers to determine their knowledge on summer tomato cultivation. Two (2) score was assigned for each correct answer and zero (0) for wrong or no answer. Score was also assigned for partially correct answer. Thus, the knowledge on

summer tomato cultivation score of the respondents could range from 0 to 26, where zero indicating no knowledge and 26 indicate the very high knowledge on summer tomato cultivation.

### **3.3.10 Attitude towards summer tomato cultivation**

Attitude of a respondent towards summer tomato cultivation was measured by developing an attitude scale through Puttaswamy (1977) given scale who developed a scale to measure the attitude of village extension workers towards training and visit system in Indian context. Here five-point Likert method of summated ratings was used to findout the tomato farmers' attitude towards summer tomato cultivation.

Nine statements expressing positive and negative feelings towards summer tomato cultivation were constructed. A statement was considered positive if it indicated a favourable attitude towards summer tomato cultivation. If the case was reverse, it was considered as a negative statement. Out of these nine statements five were positive and four were negative. Scoring was done by assigning 4, 3, 2, 1 and 0 scores to the five alternative responses as "strongly agreed", "agreed", "undecided", "disagreed", and "strongly disagreed", respectively in case of a positive statement. Reverse score was assigned for a negative statement. However, attitude towards summer tomato cultivation of a farmer was obtained by summing up his/her scores for all the nine statements in item no. 10 in the interview schedule. Attitude score, thus, obtained for a respondent could range from zero (0) to 36, where zero (0) indicated very unfavorable attitude and 36, indicated highest level of favourable attitude.

### **3.4 Instruments for Data Collection**

Data were collected using a structured interview schedule. Both open and closed form questions were included in the schedule based on the measurement procedures discussed earlier in section 3.3.

Before finalization, the interview schedule was pre-tested with 20 summer tomato farmers of the study area. On the basis of the pre- test experiences necessary corrections,

modifications and alterations were made before finalizing the interview schedule for final data collection. During modification of the schedule, valuable suggestions were received from the research supervisor and relevant experts. The interview schedule was then printed in its final form and multiplied. A copy of interview schedule in English version are placed in Appendix A.

### **3.5 Collection of Data**

Data were collected personally by the researcher herself through face to face interview. To familiarize with the study area and for getting local support, the researcher took help from the local leaders and the field staffs of Upazila Agriculture Office. The researcher made all possible efforts to explain the purpose of the study to the farmers. Rapport was established with the farmers prior to interview and the objectives were clearly explained by using local language as far as possible. Data were collected during the period of March 20 to April 5, 2015.

### **3.6 Data Processing**

After completion of field survey, all the data were coded, compiled and tabulated according to the objectives of the study. Local units were converted into standard units. All the individual responses to questions of the interview schedule were transferred in to a master sheet to facilitate tabulation, categorization and organization. In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative form.

### **3.7 Statistical Analysis**

The data were analyzed in accordance with the objectives of the study. Qualitative data were converted into quantitative data by means of suitable scoring technique wherever necessary. The statistical measures such as range, means, standard deviation, number and percentage distribution were used to describe the variables. Pearson's Product Moment Coefficient of Correlation ( $r$ ) was used in order to explore the relationships between the concerned variables. Five percent (0.05) level of probability was the basis for rejecting any

null hypothesis throughout the study. The SPSS computer package was used to perform all these process.

### **3.8 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 prove correct or incorrect of a proposition. In any event, however, it leads to an empirical test. Hypothesis are always in declarative sentence form and they relate either generally of 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.

#### **3.8.1 Research hypothesis**

Research hypothesis states a possible relationship between the variables being studied or a difference between experimental treatments that the researcher expects to emerge. The following research hypothesis was put forward to know the relationships between each of the 8 selected characteristics of the summer tomato farmers and their i) knowledge and ii) attitude towards summer tomato cultivation. “Each of the 8 selected characteristics of the summer tomato farmers will have significant relationship with their i) knowledge and ii) attitude towards summer tomato cultivation.”

#### **3.8.2 Null hypothesis**

A null hypothesis states that there is no relationship between the concerned variables. The following null hypothesis was undertaken for the present study “There is no relationship between the selected characteristics of summer tomato farmers and their i) knowledge and ii) attitude towards summer tomato cultivation.” “The selected characteristics were age, education, land possession, annual family income, training exposure, extension contact, tomato cultivation experience and problem faced in summer tomato cultivation.”

## **CHAPTER 4**

### **RESULTS AND DISCUSSION**

The findings of the study and interpretations of the results have been presented in this Chapter. These are presented in four sub-sections according to the objectives of the study. The first sub-section deals with the selected characteristics of the farmers, while the second sub-section deals with the extent of farmers' knowledge on summer tomato cultivation. The third sub-section deals with the farmers' attitude towards summer tomato cultivation. In the fourth sub-section, relationships between the selected characteristics of the farmers' with their knowledge and attitude towards summer tomato cultivation have been discussed.

#### **4.1 Selected Characteristics of Summer Tomato Farmers**

Eight characteristics of the summer tomato farmers were selected to find out their relationships with their i) knowledge and ii) attitude towards summer tomato cultivation. The selected characteristics included their age, education, land possession, annual family income, training exposure, extension contact, tomato cultivation experience and problem faced in summer tomato cultivation. These characteristics of the farmers are described in this section.

Data contained in the Table 4.1 reveal the salient features of the characteristics of the summer tomato farmers in order to have an overall picture of these characteristics at a glance. However, for ready reference, separate tables are provided while presenting categorizations, discussing and /or interpreting results concerning each of the characteristics in this chapter.

**Table 4.1 Salient features of the selected characteristics of the farmers****(n=101)**

<b>Sl. no.</b>	<b>Characteristics</b>	<b>Unit of measurement</b>	<b>Possible range</b>	<b>Observed range</b>	<b>Mean</b>	<b>SD</b>	<b>CV</b>
1.	Age	Year	unknown	25-55	38.66	8.24	21.31
2.	Education	Level of schooling	unknown	0-12	7.51	4.57	60.85
3.	Land possession	Hectare	unknown	0.07-1.25	0.45	0.29	64.44
4.	Annual family income	'000' Taka	unknown	73-275	156.86	40.91	26.08
5.	Training exposure	No. of days	unknown	1-3	2.62	0.79	30.15
6.	Extension contact	Score	0-24	10-22	16.79	1.72	10.24
7.	Tomato cultivation experience	No. of years	unknown	5-12	8.66	2.20	25.50
8.	Problem faced in summer tomato cultivation	Score	0-21	3-13	9.42	1.61	17.09



### 4.1.1 Age

The age of the summer tomato farmers ranged from 25 to 55 year, the average being 38.66 years and the standard deviation was 8.24. On the basis of their age, the summer tomato farmers were classified into three categories: “young” (up to 35), “middle aged” (36- 50) and “old” (above 50). The distribution of the summer tomato farmers according to their age is shown in Table 4.2.

**Table 4.2 Distribution of the summer tomato farmers according to their age**

Categories according to age (years)	Summer tomato farmers (n=101)	
	Number	Percent
Young (upto 35)	42	41.6
Middle aged (36-50)	50	49.5
Old (Above 50)	9	8.9
Total	101	100

The highest proportion (49.5 percent) of the summer tomato farmers were middle aged compared to 41.6 percent of them being young and only 8.9 percent old. The overwhelming majority (91.1 percent) of the summer tomato farmers were young to middle aged. This means that summer tomato cultivation in the study area is being managed by comparatively younger summer tomato farmers.

### 4.1.2 Education

The education score of the summer tomato farmers ranged from 0-12, with an average of 7.51 and standard deviation 4.57. Based on their education scores, the summer tomato farmers were classified into five categories namely illiterate (0), can sign only (0.5), primary education (1-5), secondary education (6-10) and above secondary (above 10). The distribution of the summer tomato farmers according to their education is shown in Table 4.3.

**Table.4.3. Distribution of the summer tomato farmers according to their education**

Categories according to education (schooling years)	Summer tomato farmers (n=101)	
	Number	Percent
Illiterate (0)	3	3
Can sign only (0.5)	24	23.8
Primary level (1-5)	1	1
Secondary level (6-10)	49	48.5
Above secondary level (above 10)	24	23.8
Total	101	100

It is evident from the Table 4.3 that the highest proportion (48.5 percent) of the summer tomato farmers had education up to secondary level compared to 23.8 percent of them having above secondary level education. About 24 percent of them could sign only while only 3 percent of the summer tomato farmers were illiterate. The proportion of summer tomato farmers having primary level education was only 1 percent. Thus, the overwhelming majority (72.3 percent) of the summer tomato farmers had education ranging from secondary to above secondary level. The findings thus, indicate that the current literacy rate in the study area is higher than that of the national average of 63 percent (BBS, 2008).

#### **4.1.3 Land possession**

The land possession of the summer tomato farmers ranged from 0.07 to 1.25 hectares and the mean was 0.45 hectares with standard deviation of 0.29. According to the land possession of the summer tomato farmers, they were classified into four categories as suggested by DAE (1999) “Marginal (up to 0.2)”, “Small (0.21-1)”,

“Medium (1.1-3)” and “Large (>3)”.The distribution of the summer tomato farmers according to their land possession is shown in Table 4.4.

**Table 4.4 Distribution of the summer tomato farmers according to their land possession**

Categories according to land possession (hectare)	Summer tomato farmers (n=101)	
	Number	Percent
Marginal (up to 0.2)	14	13.9
Small (0.21-1)	75	74.2
Medium (1.1-3)	4	7.9
Large (>3)	0	0
Total	101	100

Three – fourth (74.2 percent) of the summer tomato farmers possessed small land compared to 13.9 percent of them having marginal land and only 7.9 percent had medium land possession.

#### **4.1.4 Annual family income**

Annual family income of the summer tomato farmers ranged from Taka 73 thousand to 275 thousand, the mean being 156.86 thousand and standard deviation 40.91 thousand. On the basis of their annual income scores, the summer tomato farmers were divided into three categories: “low income” (up to 100), “medium income” (101-220) and “high income” (above 220). The distribution of the summer tomato farmers according to their annual family income is shown in Table 4.5.

**Table 4.5 Distribution of the summer tomato farmers according to their annual family income**

Categories according to annual family income ('000' taka)	Summer tomato farmers (n=101)	
	Number	Percent
Low income (up to 100)	4	4
Medium income (101-220)	89	88.1
High income (above 220)	8	7.9
Total	101	100

The majority (88.1 percent) of the summer tomato farmers had medium income compared to 7.9 percent of them having high income and 4 percent low income. Thus, the vast majority (92.1 percent) of the summer tomato farmers had low to medium income, indicating that tomato cultivation is usually practiced by the farmers of comparatively lower economic standings.

#### 4.1.5 Training exposure

The training exposure score of the summer tomato farmers ranged from 1 to 3 with a mean of 2.62 and standard deviation of 0.79. Based on the training exposure scores, the summer tomato farmers were classified into two categories: “ one day training ” (1), “three days training ” (3). The distribution of the summer tomato farmers according to their training exposure is presented in Table 4.6.

**Table 4.6 Distribution of the summer tomato farmers according to their training exposure**

Categories according to training exposure (no. of days)	Summer tomato farmers (n=101)	
	Number	Percent
One day training (1 day)	19	18.8
Three days training (3days)	82	81.2
Total	101	100

About 81.2 percent of the summer tomato farmers receive three days training while the rest 18.8 percent of them received one day training. Training increases knowledge and skills of the summer tomato farmers in a specific subject matter area. Individuals who gain high training exposure are likely to be more competent in performing in different activities. But the fact that summer tomato farmers who received low training, needs attention of the authorities of extension services (GOs and NGOs) in the country. Providing adequate training on appropriate subject matter is likely to increase the knowledge and attitude of the tomato farmers.

#### 4.1.6 Extension contact

The observed extension contact scores of the summer tomato farmers ranged from 10 to 22 against the possible range from 0 to 24, the mean and standard deviation were 16.79 and 1.72 respectively. According to this score, the summer tomato farmers were classified into three categories: “low extension contact” (up to 14), “medium extension contact” (15-18) and “high extension contact” (above 18). The distribution of the pond farmers according to their extension contact is shown in Table 4.7.

#### 4.7 Distribution of the summer tomato farmers according to their extension contact.

Categories according to extension contact (scores)	Summer tomato farmers (n=101)	
	Number	Percent
Low extension contact (up to 14)	12	11.9
Medium extension contact (15-18)	77	76.2
High extension contact (above 18)	12	11.9
Total	101	100

A proportion of 76.2 percent of the summer tomato farmers had medium extension contact compared to 11.9 percent of them having low extension contact. Only 11.9 percent of the summer tomato farmers had high contact.

Thus, overwhelming majority (88.1 percent) of the summer tomato farmers had low to medium extension contact. Extension contact is a very effective and powerful source of receiving information about various new and modern technologies. The status of no or having low and medium contacts might have significant impacts on the knowledge and attitude of summer tomato farmers.

#### 4.1.7 Tomato cultivation experience

The tomato cultivation experience score of the summer tomato farmers ranged from 5 to 12 with a mean of 8.66 and standard deviation of 2.20. Based on the cultivation experience scores, the summer tomato farmers were classified into three categories: “low experience” (upto 7 years ), “medium experience” (8-10 years) and “high

experience” (above 10 years). The distribution of the summer tomato farmers according to their tomato cultivation experience is presented in Table 4.8.

**Table 4.8 Distribution of the summer tomato farmers according to their tomato cultivation experience**

Categories according to tomato cultivation experience (no. of years)	Summer tomato farmers (n=101)	
	Number	Percent
Low experience (upto 7 years)	39	38.6
Medium experience (8-10 years)	23	22.8
High experience (above 10years)	39	38.6
Total	101	100

About 38.6 percent of the summer tomato farmers had high experience on summer tomato cultivation & while the rest 38.6 and 22.8 percent of them had low and medium experience on summer tomato cultivation.

#### **4.1.8 Problem faced in summer tomato cultivation**

The problem faced score of the summer tomato farmers ranged from 3 to 13 against the possible score of 0-21 with a mean of 9.42 and standard deviation of 1.61. Based on the problem faced scores, the summer tomato farmers were classified into three categories: “low problem” (upto 6), “medium problem” (7-10) and “high problem” (above 10). The distribution of the summer tomato farmers according to their problem faced is presented in Table 4.9.

**Table 4.9 Distribution of the summer tomato farmers according to their problem faced in summer tomato cultivation**

Categories according to problem faces (scores)	Summer tomato farmers (n=101)	
	Number	Percent
Low (upto 6)	2	2
Medium (7-10)	77	76.2
High (above 10)	22	21.8
Total	101	100

About 76.2 percent of the summer tomato farmers had medium problem compared to 21.8 percent of them having high problem and only 2 percent having low problem. Thus, the vast majority (78.2 percent) of the summer tomato farmers had low to medium problem.

#### 4.2 Knowledge of the farmers on summer tomato cultivation

Summer tomato farmers' knowledge scores could theoretically range from 0 to 26. But their observed knowledge scores ranged from 3 to 26, the mean being 22.41 and standard deviation 3.14. Based on the theoretical scores, the farmers were classified into three categories as: "low knowledge" (upto 18), "medium knowledge" (19 to 22), "high knowledge" (above 22). The distribution of the farmers according to their knowledge level is shown in Table 4.10.

**Table 4.10 Distribution of the farmers according to their knowledge on summer tomato cultivation**

Knowledge level (scores)	Summer tomato farmers (n=101)	
	Number	Percent
Low knowledge ( upto 18)	5	5
Medium knowledge (19-22)	43	42.6
High knowledge (above 22)	53	52.4
Total	101	100

About 42.6 percent farmers possessed medium knowledge, 52.4 percent of the farmers possessed high knowledge and only 5 percent of the farmers had low knowledge. Thus, a proportion of 95 percent of the farmers had medium to high knowledge on various aspects of summer tomato cultivation.

#### 4.3 Attitude of the Farmers towards Summer Tomato Cultivation

Attitude scores of the respondents towards summer tomato cultivation could theoretically range from 0 to 36. However, their observed scores ranged from 15 to 25 with an average of 18.92, standard deviation of 2.81, and coefficient of variation 7.9. Based on these attitude scores, the respondents were placed under three

categories namely, unfavorable, neutral, and favourable. The distribution of the respondents under each of the three categories have been shown in Table 4.11.

**Table 4.11 Distribution of the farmers according to their attitude towards summer tomato cultivation**

Extent of attitude (scores)	Summer tomato farmers (n=101)	
	Number	Percent
Unfavourable(upto 17)	38	37.6
Neutral (18)	13	12.9
Favourable ( Above 18)	50	49.5
Total	101	100

Data presented in Table 4.11 reveal that about half (49.5percent) of the respondents held favourable attitude towards the summer tomato cultivation, while the proportions of neutral and unfavourable were 12.9 and 37.6 percent, respectively.

#### **4.4 Relationship between the selected characteristics of the farmers with their knowledge and attitude towards summer tomato cultivation**

To explore the relationships between the selected characteristics of farmers knowledge and attitude towards summer tomato cultivation, "Pearson's Product-Moment Correlation Co-efficient 'r' has been used.

A hypothesis was rejected when the observed 'r' value was greater than the tabulated value of 'r' at 0.05 level of probability.

As mentioned earlier, the eight selected characteristics of the farmers were considered for the study. The variables were age, education, land possession, annual family income, training exposure, extension contact, tomato cultivation experience & problem



faced on summer tomato cultivation. Farmers' knowledge and attitude towards summer tomato cultivation were the main focus of the study.

The results of the correlation analysis between each of the selected characteristics of the farmer with their knowledge and attitude are shown in Table 4.12. In a bid to achieve the said intercorrelations, the correlation coefficients among the variables were arranged in matrix (Appendix-B).

**Table 4.12 Co-efficient of correlation (r) of selected characteristics of the summer tomato farmers' with their i) knowledge on summer tomato cultivation and ii) attitude towards summer tomato cultivation (n=101)**

Characteristics of the Farmers	Correlation of co-efficient (r) with knowledge	Correlation of co-efficient (r) with Attitude	Table value significant at (df= 99)	
			0.05 level	0.01 level
Age	0.006 <sup>NS</sup>	0.009 <sup>NS</sup>	0.195	0.254
Education	0.267**	0.017 <sup>NS</sup>		
Land possession	0.285**	0.202*		
Annual family income	0.233*	0.134 <sup>NS</sup>		
Training exposure	0.066 <sup>NS</sup>	0.041 <sup>NS</sup>		
Extension contact	0.211*	0.048 <sup>NS</sup>		
Tomato cultivation experience	0.086 <sup>NS</sup>	0.005 <sup>NS</sup>		
Problem faced in summer tomato cultivation	-0.200*	-0.136 <sup>NS</sup>		

<sup>NS</sup> Not significant

\* Significant at 0.05 level of probability

\*\* Significant at 0.01 level of probability

#### **4.4.1 Relationship between the selected characteristics of the farmers and their knowledge on summer tomato cultivation**

##### **Age and knowledge on summer tomato cultivation**

The computed value of 'r' (0.006) was smaller than that of the tabulated value (r=0.195) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12. Hence, the concerned null hypothesis was accepted and it was concluded that

age of the farmers had no significant relationship with their knowledge on summer tomato cultivation.

#### **Education and knowledge on summer tomato cultivation**

The computed value of 'r' (0.267) was greater than the tabulated value ( $r=0.254$ ) with 99 degrees of freedom at 0.01 level of probability as shown in Table 4.12 and the relationship showed a positive trend. Hence, the concerned null hypothesis was rejected. The findings indicated that education of the farmers had significant positive relationship with their knowledge on summer tomato cultivation.

#### **Land possession and knowledge on summer tomato cultivation**

The computed value of 'r' (0.285) was greater than the tabulated value ( $r=0.254$ ) with 99 degrees of freedom at 0.01 level of probability as shown in Table 4.12 and the relationship showed a positive trend. Hence, the concerned null hypothesis was rejected. The findings indicated that land possession of the farmers had significant positive relationship with their knowledge on summer tomato cultivation.

#### **Annual family income and knowledge on summer tomato cultivation**

The computed value of 'r' (0.233) was greater than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12 with a positive trend. Hence, the concerned null hypothesis was rejected. The findings indicated that annual family income of the farmers had significant positive relationship with their knowledge on summer tomato cultivation.

#### **Training exposure and knowledge on summer tomato cultivation**

The computed value of 'r' (0.066) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in the Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicated that training exposure of the farmers had no significant relationship with their knowledge on summer tomato cultivation.

#### **Extension contact and knowledge on summer tomato cultivation**

The computed value of 'r' (0.211) was greater than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12 with a

positive trend. Hence, the concerned null hypothesis was rejected. The findings indicated that extension contact of the farmers had a significant positive relationship with their knowledge on summer tomato cultivation.

#### **Tomato cultivation experience and knowledge on summer tomato cultivation**

The computed value of 'r' (0.086) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in the Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicated that tomato cultivation experience of the farmers had no significant relationship with their knowledge on summer tomato cultivation.

#### **Problem faced and knowledge on summer tomato cultivation**

The computed value of 'r' (-0.200) was greater than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12 with a negative trend. Hence, the concerned null hypothesis was rejected. The findings indicated that problem faced of the farmers had a significant negative relationship with their knowledge on summer tomato cultivation.

### **4.4.2 Relationship between the selected characteristics of the farmers and their attitude towards summer tomato cultivation**

#### **Age and attitude towards summer tomato cultivation**

The computed value of 'r' (0.009) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicated that age of the farmers had no significant relationship with their attitude towards summer tomato cultivation.

#### **Education and attitude towards summer tomato cultivation**

The computed value of 'r' (0.017) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicated that education of the farmers had no significant relationship with their attitude towards summer tomato cultivation.

### **Land possession and attitude towards summer tomato cultivation**

The computed value of 'r' (0.202) was greater than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12 with appositive trend. Hence, the concerned null hypothesis was rejected. The findings indicated that land possession of the farmers had significant positive relationship with their attitude towards summer tomato cultivation.

### **Annual family income and attitude towards summer tomato cultivation**

The computed value of 'r' (0.134) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicated that annual family income of the farmers had no significant relationship with their attitude towards summer tomato cultivation.

### **Training exposure and attitude towards summer tomato cultivation**

The computed value of 'r' (0.041) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicate that training exposure of farmers had no significant relationship with their attitude towards summer tomato cultivation.

### **Extension contact and attitude towards summer tomato cultivation**

The computed value of 'r' (0.048) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicated that extension contact of the farmers had no significant relationship with their attitude towards summer tomato cultivation.

### **Tomato cultivation experience and attitude towards summer tomato cultivation**

The computed value of 'r' (0.005) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12. Hence, the concerned null hypothesis could not be rejected. The findings indicate that tomato

cultivation experience of farmers had no significant relationship with their attitude towards summer tomato cultivation.

### **Problem faced and attitude towards summer tomato cultivation**

The computed value of 'r' (-0.136) was smaller than the tabulated value ( $r=0.195$ ) with 99 degrees of freedom at 0.05 level of probability as shown in Table 4.12 with a negative trend. Hence, the concerned null hypothesis could not be rejected. The findings indicate that problem faced of the farmers had no significant relationship with their attitude towards summer tomato cultivation.

### **Relationship between farmers knowledge and attitude towards summer tomato cultivation**

To find out the relationship between knowledge and attitude of farmers towards summer tomato cultivation Pearson Product Moment Correlation was run.

The computed value of 'r' (0.306) was greater than the tabulated value ( $r=0.254$ ) with 99 degrees of freedom at 0.01 level of probability and the relationship showed a positive trend. Hence, the concerned null hypothesis was rejected. It was concluded that knowledge and attitude of the farmers had significant positive relationship with each other. The result of 'r' between knowledge on summer tomato cultivation and attitude towards summer tomato cultivation may be seen in Appendix B.

## CHAPTER 5

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Summary of the Findings

##### 5.1.1 Selected characteristics of the summer tomato farmers

**Age:** Vast majority (91 percent) of the farmers were middle aged to young. This seems that summer tomato cultivation in the study area is being managed by comparatively younger farmers.

**Education:** The overwhelming majority (72.3 percent) of the farmers had education ranging from secondary to above secondary level.

**Land possession:** Three – fourth (74.2 percent) of the summer tomato farmers possessed small land.

**Annual family income:** The majority (88.1 percent) of the summer tomato farmers had medium income.

**Training exposure:** Overwhelming majority (81.2 percent) of the summer tomato farmers receive three days training.

**Extension contact:** Almost three-fourth (76.2 percent) of the farmers had medium extension contact.

**Tomato cultivation experience:** About 38.6 percent of the summer tomato farmers had high experience on summer tomato cultivation.

**Problem faced on summer tomato cultivation:** About 76.2 percent of the farmers had medium problem.

##### 5.1.2 Knowledge of the summer tomato farmers on summer tomato cultivation

Vast majority (95 percent) of the farmers had medium to high knowledge on various aspects of summer tomato cultivation.

### **5.1.3 Attitude of the farmers towards summer tomato cultivation**

About half (49.5 percent) of the farmers had favourable attitude towards summer tomato cultivation.

### **5.1.4 Result of hypothesis testing**

Out of eight selected characteristics of the farmers, education, land possession, annual family income and extension contact of the farmers had significant positive relationship with their knowledge on summer tomato cultivation, while problem faced by the farmers had significant negative relationship with their knowledge on summer tomato cultivation. Rest three characteristics i.e. age, training exposure and tomato cultivation experience had no significant relationship with their knowledge on summer tomato cultivation. Only land possession of the farmers had significant positive relationship with their attitude towards summer tomato cultivation. Rest six characteristics i.e. age, education, annual family income, training exposure, extension contact and tomato cultivation experience had no significant relationship with their attitude towards summer tomato cultivation.

## **5.2 Conclusions**

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

1. The findings of the study revealed that vast majority of the farmers (95 percent) had medium to high knowledge on summer tomato cultivation. Knowledge of the farmers had significant positive relationship with their education, land possession, annual family income and extension contact. Therefore, it may be concluded that it would be a wiseful thinking to improve the overall situation of knowledge by taking care of the factors related to the increase of knowledge among the farmers.
2. Attitude of the farmers is not up to mark. A proportion of 50.5 percent of the farmers had unfavourable to neutral attitude towards various aspects of summer tomato cultivation. It may be concluded that the cultivation of summer tomato will not be possible to improve to a significant extent unless the concerned authorities

take proper steps to improve farmers attitude towards summer tomato cultivation.

3. Education of the farmers had significant positive relationship with their knowledge on summer tomato cultivation. It was thus proved that farmers' knowledge is dependent with their education. Attitude of the farmers' is independent with their education. In other words it may be concluded that the education was not an important factor towards attitude of the farmers.
4. Land possession had significant and positive relationship with their knowledge and attitude towards summer tomato cultivation. It was thus proved that farmers' knowledge and attitude is dependent with their land possession.
5. Annual family income of the farmers had significant positive relationship with their knowledge on summer tomato cultivation. It was thus proved that farmers' knowledge is dependent with their annual family income.
6. Extension contact of the farmers had significant positive relationship with their knowledge on summer tomato cultivation. It was thus proved that farmers' knowledge is dependent with their extension contact.
7. Problem faced by the farmers had significant and negative relationship with their knowledge on summer tomato cultivation. It may be concluded that farmers' knowledge is dependent with their problem faced.

### **5.3 Recommendations**

Based on the findings and conclusions of the study, the following recommendations were made.

#### **5.3.1 Recommendations for policy implication**

1. It is observed that 95 percent of the farmers had medium to high knowledge on various aspects of summer tomato cultivation. So, it is strongly recommended that adequate technical support and training facilities should be extended to improve the knowledge of summer tomato farmers.



2. It is observed that 50.5 percent farmers' showed unfavourable to neutral attitude towards summer tomato cultivation. So the concerned GOs and NGOs should take necessary steps to increase positive attitude towards summer tomato cultivation.
3. The farmers' literacy rate was high and it related to their knowledge gain. It is therefore, recommended that farmers can take advantage of different printed materials i.e. book, booklets, leaflets, posters, newspapers, etc. so that they can get more knowledge easily and can increase positive attitude. It is, therefore, recommended that arrangement should be made by the concerned authorities to undertake more educational activities for increasing the education level of the farmers.
4. As stated before that generally extension contact is positive in relation to knowledge gain. The use of result demonstration and method demonstration could be more effective than mass media. But the fact that no such demonstration was found in the study area. It is thus, strongly recommended that a media campaign should be launched involving all teaching methods in a balanced way to increase the positive attitude towards summer tomato cultivation.
5. Summer tomato farmers faced considerable amount of problems on summer tomato cultivation It is therefore, recommended that concerned authorities should give due attention to the solution of the problems as soon as possible.

### **5.3.2 Recommendations for further study**

1. The study was conducted of the summer tomato farmers of selected area of Bagherpara upazila at Jessore district. Findings of this study need verification by similar research in other parts of the country.
2. Relationships of eight characteristics of the summer tomato farmers and their knowledge and attitude have been investigated in this study. Further research should be conducted to explore relationships of other characteristics of the farmers with their knowledge and attitude.

3. Education, land possession, annual family income, extension contact and problem faced of the farmers were significant related with their knowledge. Land possession of the farmers was significant related with their attitude .So, further investigation may be undertaken to verify the result.
4. Farmers' knowledge and attitude towards summer tomato cultivation has been investigated in this study. It is also necessary to study the summer tomato farmers' knowledge and attitude towards other agricultural practices.

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## APPENDICES

### Appendix - A

(English version of the interview schedule)

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

Interview schedule

#### FARMERS' KNOWLEDGE AND ATTITUDE TOWARDS SUMMER TOMATO CULTIVATION

Name of the respondent : -----

Sl. No. : -----

Father's Name : -----

Village : Upazila :

Union : District :

#### Please answer the following questions

##### 1. Age

What is your present Age? ----- Years.

##### 2. Education

a) Can't read and write: -----

b) Can sign only: -----

c) I read up to class: -----

d) I passed ----- class

##### 3. Land Possession

Please indicate your area of lands according to use

Sl. No.	Use of land	Land possession	
		Local unit	Hectare
1	Homestead area ( $A_1$ )		
2	Own land under own cultivation ( $A_2$ )		
3	Land taken from others as barga system( $A_3$ )		
4	Land given to others as barga system ( $A_4$ )		
5	Land taken from others as lease ( $A_5$ )		
	Total		

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

#### 4. Annual family income:

Mention your annual family income from the following sources.

Income sources	Income in '000' Tk.
A. Farm source	
1) Crop	
a) Rice	
(i) Aus	
(ii) Aman	
(iii) Boro	
b) Jute	
c) Wheat	
d) Sugarcane	
e) Tomato	
f) Other vegetables	
2) Livestock	
3) Poultry	
4) Fisheries	
B. Non-farm sources	
(i) Business	
(ii) Job	
(iii) Laborer	
(iv) Others	
Total	



### 5. Training exposure

Do you have participated any training?

Yes ..... No. ....

If yes, mention the following information

Sl. No.	Subject matter	Duration of training (Days)

### 6. Extension contact

Please state the extent of your contact with the following personnel.

Sl. No.		Extent of Participation			
		Regularly	Occasionally	Rarely	Never
1	Sub-Assistant Agricultural Officer (SAAO)				
2	Other farmers /neighboring farmers				
3	NGO worker				
4	Agricultural input dealer				
5	Upazilla Agricultural Officer (UAO)				
6	Radio				
7	Television program				
8	Publications like newspaper, poster, leaflet etc.				

### 7. Tomato cultivation experience

What is the extent of your tomato cultivation experience ? ..... Years.

## 8. Problem Faced in summer tomato cultivation

Please state the extent of the following problems faced in summer tomato cultivation

Sl. No.	Problem	Extent of Problems			
		Severe	Moderate	Low	Not at all
1	Inadequate training facilities				
2	Poor communication system				
3	High production cost				
4	Heavy rainfall & high temperature				
5	Lack of personal interest				
6	Lack of money				
7	Lack of contact with communication media				

## 9. Knowledge

Please answer the following questions

Questions	Full marks	Marks obtained
1. Name two varieties of summer tomato.	2	
2. What is the suitable soil condition for summer tomato cultivation?	2	
3. What is the seed rate of summer tomato (per decimal)?	2	
4. Mention the suitable time of the year for summer tomato cultivation.	2	
5. What is the function of Urea in summer tomato cultivation?	2	
6. What is the function of TSP in summer tomato cultivation?	2	
7. What is the function of MP in summer tomato cultivation?	2	
8. Name two diseases of summer tomato.	2	
9. What are the symptoms of late blight of tomato?	2	
10. Name two insects of summer tomato.	2	
11. Name two fungicides of summer tomato.	2	
12. Harvesting period of summer tomato.	2	
13. What is the difference between summer & winter tomato?	2	
<b>Total</b>	26	

## 10. Attitude towards

Please state your degree of agreement with the following statements

Sl. No.	Statements	Extent of agreement				
		Strongly agreed	Agreed	Undecided	Disagreed	Strongly disagreed
1(+)	Less infestation of diseases occurs in summer tomato cultivation.					
2(-)	High cost is involved in summer tomato cultivation.					
3(+)	Less insect attack in summer tomato cultivation than winter tomato cultivation.					
4(-)	Less yield in summer tomato production than winter tomato production.					
5(+)	Summer tomato meets the demand of tomato at summer season.					
6(-)	Summer tomato cultivation is complex.					
7(+)	Less irrigation is required for summer tomato cultivation.					
8(-)	Heavy rainfall & high temperature is injurious for tomato plant.					
9(+)	Most of the pest can be controlled by clean cultivation.					

Thank you for your cooperation.

---

Signature of the Interviewer

Date:

## APPENDIX B

**Correlation Matrix of the dependent and independent variables (N = 101)**

Variable	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>
X <sub>1</sub>	1.000	-	-	-	-	-	-	-	-	-
X <sub>2</sub>	-0.686	1.000	-	-	-	-	-	-	-	-
X <sub>3</sub>	0.035	0.098	1.000	-	-	-	-	-	-	-
X <sub>4</sub>	0.033	0.115	0.610**	1.000	-	-	-	-	-	-
X <sub>5</sub>	-0.205	0.076	0.073	0.176	1.000	-	-	-	-	-
X <sub>6</sub>	0.069	0.173	0.183	0.199*	0.401**	1.000	-	-	-	-
X <sub>7</sub>	0.158	-0.070	0.086	0.044	0.111	0.172	1.000	-	-	-
X <sub>8</sub>	0.122	-0.213*	-0.142	-0.034	0.078	-0.179	0.207*	1.000	-	-
X <sub>9</sub>	0.006	0.267**	0.285**	0.233*	0.066	0.211*	0.080	-0.200*	1.000	-
X <sub>10</sub>	0.009	0.017	0.202*	0.134	0.041	0.048	0.005	-0.136	0.306**	1.000

\* = Correlation is significant at 0.05 level of probability

\*\* = Correlation is significant at 0.01 level of probability

X<sub>1</sub> = Age

X<sub>2</sub> = Education

X<sub>3</sub> = Land possession

X<sub>4</sub> = Annual family income

X<sub>5</sub> = Training exposure

X<sub>6</sub> = Extension contact

X<sub>7</sub> = Tomato cultivation experience

X<sub>8</sub> = Problem faced in summer tomato cultivation

X<sub>9</sub> = Knowledge on summer tomato cultivation

X<sub>10</sub> = Attitude towards summer tomato cultivation

