

**ADOPTION OF LITCHI CULTIVATION BY THE
FARMERS OF DINAJPUR DISTRICT**

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INFORMATION SYSTEM**

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**ADOPTION OF LITCHI CULTIVATION BY THE
FARMERS OF DINAJPUR DISTRICT**

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CERTIFICATE

*This is to certify that the thesis entitled, “Adoption of litchi cultivation by the farmers of Dinajpur district” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE IN AGRICULTURAL EXTENSION**, embodies the result of a piece of bonafide research work carried out by **Md. Nur Alam** Registration No.15-06922 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

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

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**DEDICATED
TO MY
BELOVED PARENTS**

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TABLE OF CONTENTS

Chapters	Contents	Page
	ACKNOWLEDGEMENTS	i
	TABLE OF CONTENTS	ii
	LIST OF TABLES	vi
	LIST OF FIGURES	vii
	LIST OF APPENDICES	vii
	ABSTRACT	viii
1	INTRODUCTION	1
1.1	Background of the Study	1
1.2	Statement of the Problem	3
1.3	Specific Objectives of the Study	3
1.4	Justification of the Study	4
1.5	Assumptions of the Study	5
1.6	Limitations of the Study	6
1.7	Definition of Important Terms	6
2	REVIEW OF LITERATURE	9
2.1	Review of literature on Adoption of Crop Cultivation	9
2.2	Relationship between Farmers Characteristics with their Adoption of Innovations	11
2.2.1	Age and adoption of innovations	11
2.2.2	Education and adoption of innovations	12
2.2.3	Family size and adoption of innovations	13
2.2.4	Farm size and adoption of innovations	15
2.2.5	Annual family income and adoption of innovations	16
2.2.6	Extension media contact and adoption of innovations	17
2.2.7	Cosmopolitaness and adoption of innovations	18
2.2.8	Knowledge and adoption of innovations	19
2.2.9	Attitude and adoption of innovations	20
2.2.10	Innovativeness and adoption of innovations	21
2.3	Conceptual Framework of the Study	22

TABLE OF CONTENTS (CONT'D.)

Chapters	Contents	Page
3	METHODOLOGY	24
3.1	Locale of the Study	24
3.2	Population and Sample	24
3.3	Instrument for data collection	27
3.4	Selection of variables	27
3.5	Measurement of the Variables	28
3.5.1	Age	28
3.5.2	Education	28
3.5.3	Family size	28
3.5.4	Farm size	28
3.5.5	Annual family income	29
3.5.6	Extension media contact	29
3.5.7	Cosmopolitaness	30
3.5.8	Knowledge on litchi cultivation	30
3.5.9	Attitude toward litchi cultivation	31
3.5.10	Innovativeness	31
3.5.11	Adoption of litchi cultivation	32
3.6	Collection of data	33
3.7	Statistical Treatment	34
3.8	Statement of Hypothesis	34
3.8.1	Research hypothesis	35
3.8.2	Null hypothesis	35
4	RESULTS AND DISCUSSION	36

TABLE OF CONTENTS (CONT'D.)

Chapters	Contents	Page
4.1	Selected Characteristics of the Farmers	36
4.1.1	Age	38
4.1.2	Education	38
4.1.3	Family size	39
4.1.4	Farm size	40
4.1.5	Annual family income	40
4.1.6	Extension media contact	41
4.1.7	Cosmopolitaness	42
4.1.8	Knowledge on litchi cultivation	42
4.1.9	Attitude toward litchi cultivation	43
4.1.10	Innovativeness	44
4.2	Adoption of Litchi Cultivation	44
4.3	Relation between the Selected Characteristics of Litchi Farmers and their Adoption of Litchi Cultivation	45
4.3.1	Relationship between age of the litchi farmers and their adoption of litchi cultivation	47
4.3.2	Relationship between the education of the litchi farmers and their adoption of litchi cultivation	47
4.3.3	Relationship between family size of the litchi farmers and their adoption of litchi cultivation	48
4.3.4	Relationship between farm size of the litchi farmers and their adoption of litchi cultivation	49
4.3.5	Relationship between annual family income of the litchi farmers and their adoption of litchi cultivation	50
4.3.6	Relationship between extension media contact of the litchi farmers and their adoption of litchi cultivation	51
4.3.7	Relationship between cosmopolitaness of the litchi farmers and their adoption of litchi cultivation	51
4.3.8	Relationship between knowledge on litchi cultivation of the litchi farmers and their adoption of litchi cultivation	52
4.3.9	Relationship between attitude towards litchi cultivation of the litchi farmers and their adoption of litchi cultivation	53
4.3.10	Relationship between innovativeness of the litchi farmers and their adoption of litchi cultivation	54

TABLE OF CONTENTS (CONT'D.)

Chapters	Contents	Page
5	SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	55
5.1	Summary of Findings	55
5.1.1	Selected characteristics of the farmers	55
5.1.2	Adoption of litchi cultivation	56
5.1.3	Relationship between the selected characteristics of the Litchi farmers with their adoption of litchi cultivation	56
5.2	Conclusions	56
5.3	Recommendations	58
5.3.1	Recommendations for policy implications	58
5.3.2	Recommendation for further study	59
	REFERENCES	60
	APPENDICES	66

LIST OF TABLES

Sl. No.	Table	Page
1.1	Areas and production of litchi in Dinajpur district and Bangladesh from 2006-2007 to 2010-2011	2
1.2	Area coverage and production of litchi in different district of Bangladesh from 2009-2010 to 2010-2011	2
3.1	Distribution of the population, sample and number of litchi farmers in the reserve list	27
4.1	A summary profile of the farmers' selected characteristics	37
4.2	Distribution of the litchi farmers according to their age	38
4.3	Distribution of the litchi farmers according to their education	39
4.4	Distribution of the litchi farmers according to their family size	39
4.5	Distribution of the litchi farmers according to their farm size	40
4.6	Distribution of the litchi farmers according to their annual family income	41
4.7	Distribution of the litchi farmers according to their extension media contact	41
4.8	Distribution of the litchi farmers according to their cosmopolitaness	42
4.9	Distribution of the litchi farmers according to their knowledge on litchi cultivation	43
4.10	Distribution of the litchi farmers according to their attitude towards litchi cultivation	43
4.11	Distribution of the litchi farmers according to their innovativeness	44
4.12	Distribution of the litchi farmers according to their adoption of litchi cultivation	45
4.13	Spearman rank co-efficient of co-relation showing relationship between adoption of litchi cultivation and selected characteristics of the farmers	46

LIST OF FIGURES

Sl. No.	Figure	Page
2.1	Conceptual framework of the study	23
3.1	A map of Dinajpur district	25
3.2	A map of Sadar upazila showing the study unions	26

LIST OF APPENDICES

Sl. No.	Appendix	Page
A	English version of the interview schedule	66
B	Correlation matrix of the among the variables of the study	72

ADOPTION OF LITCHI CULTIVATION BY THE FARMERS OF DINAJPUR DISTRICT

BY

MD. NUR ALAM

ABSTRACT

The purpose of the study was to determine and describe the extent of adoption of litchi cultivation by the farmers and to explore the relationships between each of the selected characteristics of the farmers and their adoption of litchi cultivation. Auliapur union and Chehelgazi union under Sadar upazila of Dinajpur district was the locale of the study. Data were collected from 103 randomly selected farmers by using interview schedule during 15 May to 7 July 2017. The finding revealed that about three-fourths (70.9%) of the farmers had medium adoption, 25.2 percent had low and 3.9 percent had high adoption of litchi cultivation. Spearman Rank Correlation co-efficient (r) was computed to explore the relationships between each of the selected characteristics of the farmers and their adoption of litchi cultivation. The correlation analysis indicated that, age, education, cosmopolitaness, knowledge on litchi cultivation and attitude towards litchi cultivation had significant positive relationship with the adoption of litchi cultivation. Family size, farm size, annual family income, extension media contact and innovativeness had no significant relationships with the adoption of litchi cultivation.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Litchi (*Litchi Chinensis.*) is one of the most important sub-tropical evergreen trees. Litchi fruit is famous for its excellent quality, juicy, slightly sour and sweetly taste, characteristics pleasant flavour and for attractive colour. A bunch of ripen litchi attracts everyone irrespective of all ages. Litchi is mostly consumed as table fruit. It is also preserved and canned. Litchi contains 77.83% water, 6.74% - 20.64% sugar, 0.8-0.9% protein, 0.3% fat, minerals specially calcium, phosphorus and iron 0.7% and vitamin C 40.2-90 mg/100g of fruits (Bose and Mitra, 1990; Scanlan, 1995).

Litchi was originated in southern China but it is now cultivated throughout the warm sub-tropics and is believed to have been introduced in the Indian subcontinent through Myanmar towards the end of the 17th century (Bose and Mitra. 1990). The leading litchi growing countries of the world are China. Myanmar. Taiwan, Thailand, Vietnam, Indonesia, India, Pakistan, Philippines, West Indies, USA (Hawaii and Florida), Brazil. Israel. Madagascar, South Africa and Australia (Menzell and Simpson. 1986; Tindall, 1994).

Due to certain limitations of soil and climatic conditions, litchi grows well in some selective areas of Bangladesh. The leading litchi growing districts are Dinajpur, Rajshahi, Rangpur, Jessore, Pabna, Chittagong, Dhaka and Mymensingh. There are number of litchi cultivars such as Bedana, Bombai, Dinajpur local, Mangalbari growing in different Muzaffarpuri and Madrajee are introduced and cultivated in different areas of Bangladesh. Recently BARI litchi-1, 2 and 3 were released for commercial production by Bangladesh Agricultural Research Institute (BARI) as high yielding litchi cultivars. From the statistics of litchi cultivation of last 5 years (Table 1.1), it is found that both area and production of litchi cultivation is increasing not only in the whole country but also in Dinajpur district. The yield of litchi is increasing with the production of the increasing area.

Table 1.1 Areas and production of litchi in Dinajpur district and Bangladesh from 2006-2007 to 2010-2011

Year	Bangladesh		Dinajpur	
	Area (Acre)	Production (M. Tons)	Area (Acre)	Production (M. Tons)
2006-2007	4286	43565	518	9465
2007-2008	5789	43767	870	9245
2008-2009	3973	55288	1001	10191
2009-2010	4259	64995	1087	13226
2010-2011	4602	66510	1420	12387

Source: BBS, 2011

Table 1.2 Area coverage and production of litchi in different districts of Bangladesh from 2009-2010 to 2010-2011

Region	Area (Acre)		Production (M. Tons)	
	2009-2010	2010-2011	2009-2010	2010-2011
Dinajpur	1087	1420	13226	12387
Pabna	1044	1034	3779	4986
Rajshahi	390	304	9226	7998
Dhaka	164	163	2166	2138
Rangpur	61	80	2886	2858
Jessore	180	203	4811	6241
Khulna	202	177	1385	1374
Kushtia	501	536	3234	4518
Mymensingh	50	20	8665	9187

Source: BBS, 2011

The findings of the present study can be a key in extending the adoption of litchi cultivation in Bangladesh. These will be helpful for planning adaptive research, formulating extension message and production plans. This will help to understand the picture of litchi cultivation, adopted by the farmers under sadar upazila of Dinajpur district. With the end in view the Author become keenly interested to investigate the characteristics of the farmers related to adoption of litchi cultivation under sadar upazila of Dinajpur district.

1.2 Statement of the Problem

Litchi is one of the most important fruit in Bangladesh. The importance of the cultivation is increasingly recognized by the implement as of agricultural extension programs as well as policy makers. The government of Bangladesh is promoting the extent of cultivation and production of this fruits through various projects. As a high value fruit, litchi has much potentiality for widespread cultivation by the respondents. But before undertaking any massive programme for its increased cultivation in Bangladesh, it is first necessary to know the existing situation of the extent of cultivation of litchi in the most potential areas of Bangladesh. The Dinajpur region is mostly well known for cultivation of litchi in this country. To expand the cultivation of this fruits in other parts of the country, the knowledge on the present situation of litchi cultivation in this region will be significantly contributory to design appropriate programs for its widespread cultivation. In these respects, the answers to the following questions will be very much pertinent.

1. At what extent the farmers of Sadar Upazila of Dinajpur district adopted litchi cultivation?
2. What are the characteristics of the litchi farmers that are to be selected for studying the adoption of litchi cultivation?
3. Are there any relationships between the adoption of litchi cultivation by the farmers and their selected characteristics?

1.3 Specific Objectives of the Study

In order to give proper direction to the study and to keep it under manageable limit, the following objectives were developed:

1. To determine and describe the extent of adoption of litchi cultivation by the farmers
2. To determine and describe the following selected characteristics of the farmers:

The selected characteristics are:

- ❖ Age
- ❖ Education
- ❖ Family size

- ❖ Farm size
- ❖ Annual family income
- ❖ Extension media contact
- ❖ Cosmopolitaness
- ❖ Knowledge on litchi cultivation
- ❖ Attitude towards litchi cultivation
- ❖ Innovativeness

3. To explore the relationship between each of the selected characteristics of the farmers and their adoption of litchi cultivation

1.4 Justification of the Study

To meet the nutritional and caloric value of the growing population and for increasing employment opportunities and income of the growers, the government of Bangladesh has much emphasis on diversified fruit cultivation. Before giving any policy direction towards increasing cultivation of various fruits, relevant and adequate information on different aspects of cultivation at the growers level are required. So far, little systematic investigations on litchi cultivation have been undertaken either by private or government organizations in Bangladesh.

The present study is an attempt to know the adoption of litchi cultivation. This study will be helpful to the researchers for further studies of similar nature and to the extension personnel who are directly involved in different agricultural development programmes and to the planners for making effective plans. The study will also aid extension workers to learn the cultivation problems of the fruit and therefore, they will be able to give suggestions to the growers related to various aspects of litchi cultivation.

1.5 Assumptions of the Study

An assumption is the supposition that an apparent fact on principle is true in the light of the available evidence (Goode, 1945). The researcher had the following assumption in mind while carrying out this study:

1. The respondents included in the sample were competent enough to furnish proper responses to the queries included in the interview schedule.
2. The researcher who acted as an interviewer was well adjusted to the social and cultural environment of the study area. Hence, the data collected by him from the respondents were free from bias and the respondents furnished their opinion without hesitation.
3. The responses furnished by the respondents were reliable which they expressed about their activities and opinions.
4. The findings of the study will have general implication to any part of the country where, physical, socio-economic and cultural conditions do not differ much from the study area.
5. The adoption of litchi cultivation practices by the Litchi farmers is normally and independently distributed with their respective means and standard deviation.
6. The nature of problems gave a representative feature in the context of the other rural areas of Bangladesh.

1.6 Limitations of the Study

In order to keep the study under manageable limit, the following limitations were recognized:

1. This study was confined to different villages of two unions of Sadar upazila under Dinajpur district.
2. There were many farmers in the study area, but only the farmers who were involved in litchi cultivation were considered for this study.
3. Characteristics of the farmers were many and varied but only ten characteristics were selected for investigation in this study.
4. During data collection the researcher had to depend on data furnished by the respondents. As none of the farmers kept records of their farming activities, they furnished information to the different questions by recall.
5. Facts and figures were collected by the investigator applied to the present situation in the selected area.
6. Adoption of the farmer could be measured in various ways. However in this study these were measured by combining three dimension of adoption.

1.7 Definition of Important Terms

For clarity of understanding certain terms frequently used throughout the study are defined and interpreted as follows:

Adoption

Innovation-decision is a psychological process through which an individual of a social system engages in mental activities just from first hearing about an innovation to its final adoption. The entire process consists of five stages viz.; knowledge, persuasion, decision, implementation and confirmation (Bhuiyan, 2012). Simply, adoption is an implementation of a decision to use of an innovation. According to Rogers (1995), "Adoption is a decision to make full use of an innovation as the best course of action

available". When an individual takes up a new idea as the best course of action and practices it, the phenomenon is known as adoption (Ray, 1991).

Age

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

Education

Education refers to the ability of the respondents to read and write or having formal education received up to a certain standard. Education is measured on the basis of class a farmer had passed from formal educational institution.

Family size

It refers to the total number of members in the family including the respondents himself, his wife, children and other permanent dependents, who live and ate together as a family unit.

Farm size

The term related to the hectare of land owned by a farmers on which he carried his farming and family business, the area being estimated in terms of full benefit to the farmers. A farmer was considered to have full benefit from cultivated area either owned by himself or obtained or, lease from others and half benefit from the area which was either cultivated by borga or given to others for cultivation on borga basis.

Annual income

The term annual income refers to the earning of the respondent himself from agriculture, livestock, fisheries and other accessible sources (business, service, daily labour etc.) during a year. It was expressed in Taka.

Extension contact

Extension contact refers to one's access to the communication process through various extension teaching methods during one year prior to data collection.

Cosmopolitanness

Cosmopolitanness of a respondent is referred to the degree of external orientation of an individual to his own social system.

Knowledge on litchi cultivation

It refers to the extension of understanding of an individual about different facts information, causes and effects related to litchi cultivation.

Attitude towards Litchi cultivation

The term attitude towards litchi cultivation of an individual was used to refer to his feelings, belief and action tendencies towards the various aspects of litchi cultivation.

Innovativeness

Innovativeness refers to the degree to which an individual is relatively earlier in adopting new ideas than the other members of social system (Rogers, 1995). The respondents measured innovativeness of a respondent on the basis of adoption of five improved practices.

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this Chapter is to review of literature having relevance to the present study. The researcher made an elaborate search of available literature for the above purpose. But there are few studies that deal with the relationship of the characteristics of farmers and their adoption of litchi cultivation by the litchi farmers. The researcher attempted to search the literatures on a number of studies related to adoption of litchi cultivation by the litchi farmers. Therefore, the finding of such studies related to the extent of adoption of litchi cultivation by the litchi farmers and other partial studies have been reviewed in this chapter. This chapter is divided into three sections. The first section deals with the review of literature on adoption of crop cultivation, the second section deals with the relationship between farmers characteristics and their adoption of innovations and the third section deals with the conceptual framework of the study.

2.1 Review of Literature on Adoption of Crop Cultivation

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

Salam (2003) found that an overwhelming majority (94%) of the respondents had high constraints in adopting environmentally friendly farming practices while 6 percent had medium constraints. No farmer was found having low constraint.

Hasan (2003) found that majority (60%) of the farmers had medium adoption of recommended potato cultivation practices while 33 percent had low adoption and 7 percent had high adoption of recommended potato cultivation practices.

Hasan (2006) reported that about three-fifths (63%) of the growers had medium adoption while 17 percent had low adoption and 20 percent had high adoption of improved practices in litchi cultivation.

Yadav and Kumar (2006) found that majority (78.75%) of the farmers had medium adoption while 12.50 percent had low adoption and only 8.75 percent had high adoption of scientific wheat cultivation technologies.

Nande and Basunathe (2009) revealed that majority (65.12%) of the farmers had medium adoption while 18.60 percent had low adoption and 16.28 percent had high adoption of improved dairy cattle management practices.

Singh (2010) observed that majority (58%) of the farmers had medium adoption while 24 percent had low adoption and 18 percent had high adoption of recommended potato cultivation practices.

Prasad and Ram (2010) found that majority (50.00%) of the farmers had medium adoption while 16.37 percent had low adoption and 33.63 percent had high adoption of improved wheat cultivation technologies.

Ziauddin and Goswami (2010) reported that 38.3 percent of the farmers had medium adoption while 25.8 percent had low adoption and 35.8 percent had high adoption of scientific fish cultivation practices.

Singh and Barman (2010) observed that majority (66%) of the farmers had medium adoption while 19 percent had low adoption and 15 percent had high adoption of recommended vegetable cultivation practices.

Singh and Priyadarshi (2010) found that majority (59.5%) of the farmers had medium adoption while 28 percent had low adoption and 12.5 percent had high adoption of improved mango production practices.

Baruah and Singha (2011) revealed that 58.00 percent of the farmers had medium adoption while 31.11 percent had low adoption and 24.44 percent had high adoption of recommended rice cultivation practices.

Kumbhare and Singh (2011) observed that majority (53.75%) of the farmers had high adoption while 14.5 percent had low adoption and 31.75 percent had medium adoption of improved wheat and paddy production technology.

Yadaw and Sharma (2012) reported that majority (82.5%) of the farmers had high adoption while only 5.0 percent had low adoption and 12.50 percent had medium adoption of recommended goat rearing practices.

Mehta and Sonawane (2012) revealed that 73 percent of the farmers had medium adoption while 10 percent had low adoption and 17 percent had high adoption of recommended mango cultivation practices.

Devi (2013) found that majority (59.09%) of the farmers had medium adoption while 18.18 percent had low adoption and 22.73 percent had high adoption of dairy farming technologies.

Chouhan and Singh (2013) reported that majority (74.16%) of the farmers had medium adoption while 12.50 percent had low adoption and 13.34 percent had high adoption of improved sugarcane cultivation practices.

Rao and Singh (2014) observed that majority (65.33%) of the farmers had medium adoption while 10 percent had low adoption and 24.67 percent had high adoption of recommended pineapple cultivation practices.

Deshmukh and Bariya (2014) found that majority (65.83%) of the farmers had medium adoption while 19.17 percent had low adoption and 15.00 percent had high adoption of recommended Kharif groundnut practices.

2.2 Relationship between Farmers Characteristics with their Adoption of Innovations

2.2.1 Age and adoption of innovations

Pathak *et al.* (1992) observed that there was positive and significant relationship between the age of the marginal farmers and their adoption of jute technologies.

Sardar (2002) found that the age of the farmers had negative significant correlation with their adoption of IPM practices.

Aurangozeb (2002) observed that there was significant negative relationship between age and adoption of integrated homestead farming technologies.

Ali (2004) found there was no relationship between age of the farmers and adoption of aquaculture technology by them.

Ahmed (2006) found that the age of the farmers had no significant negative relationship with their adoption of selected wheat varieties.

Mahmud (2006) found that the age of the farmers had non significant positive correlation with their adoption of modern wheat cultivation technologies.

Hasan (2006) observed that age of the growers did not show any significant relationship with their adoption of improved practices in litchi cultivation.

Ghosh and Maitra (2008) reported that age of the farmers show negative and significant relationship with their adoption of dairy farming practices.

Nande and Basunathe (2009) revealed that age of the farmers did not show any significant relationship with their adoption of improved dairy cattle management practices.

Singh (2010) observed that age of the farmers show negative and significant relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) found that age of the farmers show negative and significant relationship with their adoption of scientific fish cultivation practices.

Yadaw and Sharma (2012) revealed that age of the farmers show negative relationship with their adoption of recommended goat rearing practices.

Chander and Akila (2012) reported that age of the farmers did not show any significant relationship with their adoption of draught bullock management.

Mehta and Sonawane (2012) revealed that age of the farmers show negative relationship with their adoption of recommended mango cultivation practices.

Chouhan and Singh (2013) reported that age of the farmers show significant relationship with their adoption of improved sugarcane cultivation practices.

Devi (2013) found that age of the farmers did not show any significant relationship with their adoption of dairy farming technologies.

Rao and Singh (2014) observed that age of the farmers show negative and significant relationship with their adoption of pineapple cultivation practices.

2.2.2 Education and adoption of innovations

Sardar (2002) found that the education of the farmers had significant positive relationship with their adoption of IPM practices.

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

Islam (2003) conducted a study on adoption of organic manures. He found that there was a positive and significant positive relationship between education of the farmers and their adoption of organic manures.

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

Ahmed (2006) found that the education of the farmers had no significant positive relationship with their adoption of selected wheat varieties.

Mahmud (2006) found that the education of the farmers had significant positive correlation with their adoption of modern wheat cultivation technologies.

Hasan (2006) found that education of the growers showed significant and positive relationship with their adoption of improved practices in litchi cultivation.

Nande and Basunathe (2009) reported that education of the growers showed positive and significant relationship with their adoption of improved dairy cattle management practices.

Singh (2010) observed that education of the farmers showed significant and positive relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) revealed that education of the farmers did not show any significant relationship with their adoption of scientific fish cultivation practices.

Chander and Akila (2012) found that education of the farmers show positive but not significant relationship with their adoption of draught bullock management.

Yadaw and Sharma (2012) reported that education of the farmers did not show any significant relationship with their adoption of recommended goat rearing practices.

Mehta and Sonawane (2012) observed that education of the farmers showed significant relationship with their adoption of recommended mango cultivation practices.

Chouhan and Singh (2013) revealed that education of the farmers show significant relationship with their adoption of improved sugarcane cultivation practices.

Devi (2013) reported that education of the farmers showed significant relationship with their adoption of dairy farming technologies.

Rao and Singh (2014) found that education of the farmers showed significant and positive relationship with their adoption of pineapple cultivation practices.

2.2.3 Family size and adoption of innovations

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok-6201 hybrid rice in sadar upazila of Mymensingh district. He found that family size of the farmers had no significant relationship with their adoption of Aalok-6201 hybrid rice.

Hasan (2006) found that family size of the growers showed significant and negative relationship with their adoption of improved practices in litchi cultivation.

Ghosh and Maitra (2008) reported that family size of the farmers show negative relationship with their adoption of dairy farming practices.

Nande and Basunathe (2009) observed that family size of the farmers did not show any significant relationship with their adoption of improved dairy cattle management practices.

Singh (2010) found that family size of the farmers showed positive relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) revealed that family size of the farmers show negative and non-significant relationship with their adoption of scientific fish cultivation practices.

Singh and Priyadarshi (2010) reported that family size of the farmers showed negative significant relationship with their adoption of improved mango production practices.

Mehta and Sonawane (2012) found that family size of the farmers showed negative relationship with their adoption of recommended mango cultivation practices.

Yadaw and Sharma (2012) observed that family size of the farmers did not show any significant relationship with their adoption of recommended goat rearing practices.

Chander and Akila (2012) revealed that family size of the farmers showed negative relationship with their adoption of draught bullock management.

Chouhan and Singh (2013) reported that family size of the farmers did not show any significant relationship with their adoption of improved sugarcane cultivation practices.

Devi (2013) found that family size of the farmers did not show any significant relationship with their adoption of dairy farming technologies.

Rao and Singh (2014) observed that family size of the farmers did not show any significant relationship with their adoption of pineapple cultivation practices.

2.2.4 Farm size and adoption of innovations

Rahman (2001) conducted an investigation on knowledge, attitude and adoption of Aalok-6201 hybrid rice by the farmers of sadar upazila in Mymenshigh district. He observed that there was a significant positive relationship between farm size of the farmers and their adoption of Aalok-6201 hybrid rice.

Hussen (2001) conducted an investigation on adoption of modern sugarcane cultivation practices by the farmers' of Dewangonj upazila in Jamalpur district. He observed that there was a significant positive relationship between farm size of the farmers and their adoption of modern sugarcane cultivation practices.

Aurangozeb (2002) conducted a study on adoption of integrated homestead farming technologies by the rural women in RDRS. He found that there had no relationship between homestead area and their adoption of integrated homestead farming technologies.

Hasan (2006) revealed that farm size of the growers showed significant and positive relationship with their adoption of improved practices in litchi cultivation.

Singh (2010) found that farm size of the farmers showed positive relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) observed that farm size of the farmers show positive and significant relationship with their adoption of scientific fish cultivation practices.

Chander and Akila (2012) reported that farm size of the farmers showed positive and significant relationship with their adoption of draught bullock management.

Yadaw and Sharma (2012) found that knowledge of the farm size showed positive and highly significant relationship with their adoption of recommended goat rearing practices.

Chouhan and Singh (2013) observed that farm size of the farmers show significant relationship with their adoption of improved sugarcane cultivation practices.

Devi (2013) found that farm size of the farmers show negative relationship with their adoption of dairy farming technologies.

Rao and Singh (2014) reported that farm size of the farmers showed positive and significant relationship with their adoption of pineapple cultivation practices.

2.2.5 Annual family income and adoption of innovations

Sardar (2002) conducted a study on adoption of IPM practices by the farmers under PETRRA project of RDRS. He found that the annual income of the farmers had no relationship with their adoption of IPM practices.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He observed that the annual income of the farmers had no relationship with their adoption of modern agricultural technologies.

Aurangozeb (2002) conducted a study on adoption of integrated homestead farming technologies by the rural women in RDRS. He found that there was a positive significant relationship between annual income of the respondents and their adoption of integrated homestead farming Technologies.

Hasan (2006) reported that annual income of the growers showed significant and positive relationship with their adoption of improved practices in litchi cultivation.

Singh (2010) found that annual income of the farmers showed significant relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) observed that annual income of the farmers showed positive and significant relationship with their adoption of scientific fish cultivation practices.

Yadaw and Sharma (2012) revealed that annual income of the farmers showed positive and highly significant relationship with their adoption of recommended goat rearing practices.

Mehta and Sonawane (2012) found that annual income of the farmers showed positive and highly significant relationship with their adoption of recommended mango cultivation practices.

Chouhan and Singh (2013) observed that annual income of the farmers showed significant relationship with their adoption of improved sugarcane cultivation practices.

Rao and Singh (2014) found that annual income of the farmers had positive and significant relationship with their adoption of pineapple cultivation practices.

2.2.6 Extension media contact and adoption of innovations

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

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

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

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

Mahmud (2006) found that the extension media contact of the farmers had significant positive correlation with their adoption of modern wheat cultivation technologies.

Hasan (2006) observed that extension contact of the growers showed significant relationship with their adoption of improved practices in litchi cultivation.

Ghosh and Maitra (2008) found that extension contact of the growers showed positive and highly significant relationship with their adoption of dairy farming practices.

Nande and Basunathe (2009) reported that extension contact of the growers showed positive and significant relationship with their adoption of improved dairy cattle management practices.

Singh (2010) revealed that extension contact of the farmers showed positive relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) found that extension contact of the farmers showed positive and significant relationship with their adoption of scientific fish cultivation practices.

Singh and Barman (2011) observed that extension contact of the farmers showed significant relationship with their adoption of tomato and cauliflower cultivation technologies.

Yadaw and Sharma (2012) reported that extension contact of the farmers showed positive and significant relationship with their adoption of recommended goat rearing practices.

Mehta and Sonawane (2012) found that extension contact of the farmers showed positive and highly significant relationship with their adoption of recommended mango cultivation practices.

Chouhan and Singh (2013) revealed that extension contact of the farmers showed significant relationship with their adoption of improved sugarcane cultivation practices.

Devi (2013) reported that extension contact of the farmers showed positive and significant relationship with their adoption of dairy farming technologies.

Rao and Singh (2014) found that extension contact of the farmers showed positive and significant relationship with their adoption of pineapple cultivation practices.

2.2.7 Cosmopolitanism and adoption of innovations

Rahman (2001) conducted an investigation on knowledge, attitude and adoption of Aalok-6201 hybrid rice by the farmers of sadarupazila in Mymenshig district. He observed that there was a significant positive relationship between cosmopolitanism of the farmers and their adoption of Aalok-6201 hybrid rice.

Hussen (2001) conducted an investigation on adoption of modern sugarcane cultivation practices by the farmers of Dewangonjupazila in Jamalpur district. He observed that there was a significant positive relationship between cosmopolitanism of the farmers and their adoption of modern sugarcane cultivation practices.

Auronggeb (2002) conducted a study on the adoption of integrated homestead farming technologies by the rural women in RDRS. He found a significant relationship between cosmopolitanism and adoption of integrated homestead farming technologies.

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

Rahman (2003) found that cosmopolitanism of the farmers had significant positive relationship with their adoption of intercropping in pineapple cultivation.

Hasan (2006) observed that cosmopolitanism of the growers showed significant relationship with their adoption of improved practices in litchi cultivation.

Ghosh and Maitra (2008) reported that cosmopolitanism of the growers showed positive and highly significant relationship with their adoption of dairy farming practices.

Singh (2010) found that cosmopolitanism of the farmers showed positive relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) revealed that cosmopolitanism of the farmers showed positive and significant relationship with their adoption of scientific fish cultivation practices.

Goswami (2012) found that cosmopolitanism of the farmers had positive and highly significant relationship with their adoption of scientific fish cultivation practices.

Yadav and Sharma (2012) observed that cosmopolitanism of the farmers had positive and significant relationship with their adoption of recommended goat rearing practices.

2.2.8 Knowledge and adoption of innovations

Sarder (2002) in his study revealed that agricultural knowledge of the farmers had positively significant with their adoption of IPM practices.

Ahmed (2006) found that the knowledge on wheat cultivation of the farmers had significant positive relationship with their adoption of selected wheat varieties.

Mahmud (2006) found that the knowledge on wheat cultivation of the farmers had significant positive correlation with their adoption of modern wheat cultivation technologies.

Hasan (2006) found that knowledge of the growers showed significant and positive relationship with their adoption of improved practices in litchi cultivation.

Ghosh and Mitra (2008) observed that knowledge of the growers showed positive and highly significant relationship with their adoption of dairy farming practices.

Singh (2010) revealed that knowledge of the farmers showed positive and significant relationship with their adoption of potato cultivation practices.

Ziauddin and Goswami (2010) reported that knowledge of the farmers show positive and significant relationship with their adoption of scientific fish cultivation practices.

Singh and Barman (2011) observed that knowledge of the farmers showed significant relationship with their adoption of tomato and cauliflower cultivation technologies.

Chander and Akila (2012) found that knowledge of the farmers showed positive and significant relationship with their adoption of draught bullock management.

Yadaw and Sharma (2012) revealed that knowledge of the farmers showed positive and highly significant relationship with their adoption of recommended goat rearing practices.

Mehta and Sonawane (2012) found that knowledge of the farmers show positive and highly significant relationship with their adoption of recommended mango cultivation practices.

Chouhan and Singh (2013) reported that knowledge of the farmers showed significant relationship with their adoption of improved sugarcane cultivation practices.

Devi (2013) found that knowledge of the farmers showed positive and significant relationship with their adoption of dairy farming technologies.

2.2.9 Attitude and adoption of innovations

Hossain (1981) conducted a study on relationships of selected characteristics of the Jute growers with their adoption of improved practices of Jute cultivation. He found that there is no relationship between attitude towards intensive Jute cultivations scheme of the Jute growers and their adoption of improved practices of jute cultivation.

Hasan (1996) conducted a study on adoption of some selected agricultural technologies among the farmers as perceived by the frontline GO and NGO workers. He found that there was strong positive relationship between attitude towards development and perceived adoption of selected technologies.

Podder (1999) conducted a study on the adoption of Mehersagar Banana by the farmers of Gazaria union under Sakhipur Thana of Tangail district. He found that there was no relationship between attitude towards technology of the growers and their adoption of mehersagar banana.

Islam (2002) revealed that the attitude towards technology of the farmers had a significant positive relationship with their adoption of modern agricultural technologies.

Ahmed (2006) found that the attitude toward wheat cultivation of the farmers had significant positive relationship with their adoption of selected wheat varieties.

2.2.10 Innovativeness and adoption of innovations

Hossain (1999) found a positive relationship between innovativeness of the farmers and their adoption of fertilizer and also observed no relationship with adoption of pesticides.

Aurangozeb (2002) observed that there was significant relationship between innovativeness and adoption of integrated homestead farming technologies.

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

Ahmed (2006) found that the innovativeness of the farmers had significant positive relationship with their adoption of selected wheat varieties.

Hasan (2006) found that innovativeness of the growers showed significant relationship with their adoption of improved practices in litchi cultivation.

Ghosh and Maitra (2008) observed that innovativeness of the growers showed positive and highly significant relationship with their adoption of dairy farming practices.

Ziauddin and Goswami (2010) reported that innovativeness of the farmers showed positive and significant relationship with their adoption of scientific fish cultivation practices.

Singh and Priyadarshi (2010) revealed that innovativeness of the farmers showed positive and highly significant relationship with their adoption of improved mango production practices.

Mehta and Sonawane (2012) found that innovativeness of the farmers showed positive and highly significant relationship with their adoption of recommended mango cultivation practices.

Rao and Singh (2014) reported that innovativeness of the farmers did not show any significant relationship with their adoption of pineapple cultivation practices.

2.3 The Conceptual Framework of the Study

The present study would be tried to focus two concepts; first the farmers' selected characteristics and the second, their adoption of litchi cultivation. Adoption of litchi cultivation of an individual may be influenced and affected through interacting forces in his surrounding. Adoption of litchi cultivation and individual farmer may also be influenced by these personal, economic, social and physiological characteristics. In this study, farmers' characteristics have only been taken into consideration. Moreover, it is quite impossible to deal with all the characteristics. Selected characteristics were: age, education, family size, farm size, annual income, extension contact, cosmopolitanism, knowledge on litchi cultivation, attitude towards litchi cultivation and innovativeness. These ten (10) characteristics were the casual variables of this study, while adoption of litchi cultivation being the main focus of the study. A sample conceptual framework in this connection has been given below:

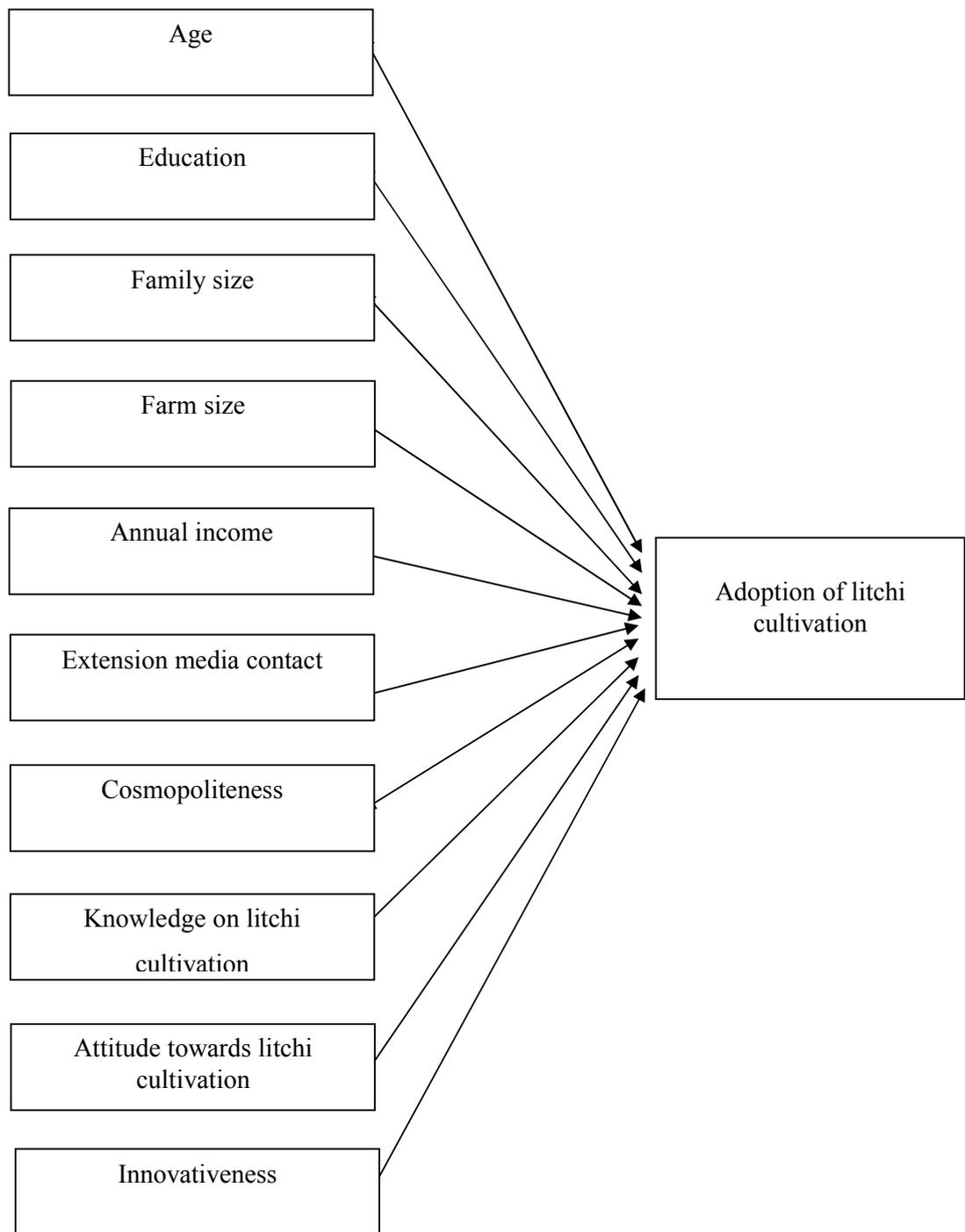


Figure 2.1 Conceptual framework of the study

CHAPTER 3

METHODOLOGY

In any scientific research methodology plays an important role. Methodology should be such that enables the researcher to collect valid information and to analyze the same properly to arrive at correct decisions. The purpose of this Chapter is to describe the methods and procedures followed in conducting the present study.

3.1 Locale of the Study

Considering the litchi growing area, two unions namely Auliapur and Chehelgazi under sadar upazila of Dinajpur district were selected as the local of the study. The map of Dinajpur district showing Sadar upazila and a map of Sadar upazila showing the study area have been shown in the Figure 3.1 and Figure 3.2, respectively.

3.2 Population and Sample

Two upto date lists of all the litchi farmers of the selected unions were collected from agricultural survey report of sadar upazila Agricultural Office of Dinajpur. The total number of litchi farmers in these two unions was about 309 which constituted the population of the study.

Out of these 309 litchi farmers of the selected 2 unions, 103 litchi farmers were selected as the sample of the study by using proportionate random sampling technique by taking 33% from each of the two unions.

Besides, reserve list of litchi farmers was also prepared. Farmers of the reserve list were used only when a respondent included in the original list was not available during data collection. Distribution of the farmers constituting population, sample and reserve list are shown in Table 3.1.



Figure 3.1 A Map of Dinajpur District showing sadar upazila

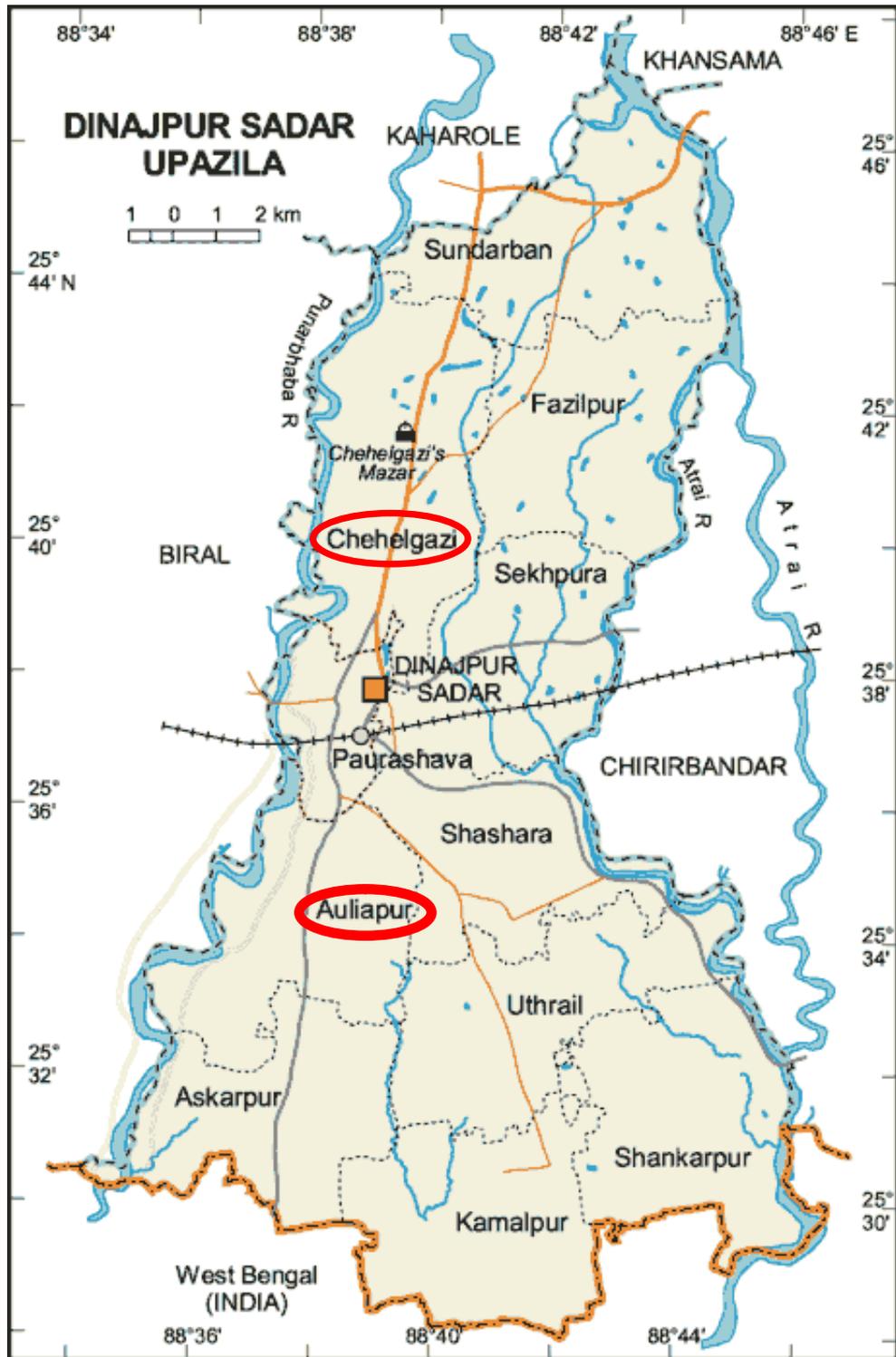


Figure 3.2 A map of sadar upazila showing the study unions

3.1 Distribution of the population, sample and number of litchi farmers in the reserve list

Name of the union	Population size	Sample size	Reserve list
Auliapur	197	66	6
Chehelgazi	112	37	4
Total	309	103	10

3.3 Instrument for data collection

An interview schedule was prepared for data collection from the litchi farmers of Sadar Upazila of Dinajpur district. It was prepared keeping the objectives of the study in mind. The schedule contained both open and closed form questions. Direct and simple questions were included in the schedule to collect data on the selected variables. A draft schedule was prepared and pre-tested before using the same for collection of data. For pre-test purpose twelve farmers of the study area were interviewed by using the draft interview schedule. Based on the pre-test experience, necessary corrections, additions, alterations and rearrangement were made in the schedule. Then final interview schedule was prepared and multiplied. Thus, the schedule was prepared for final use.

3.4 Selection of Variables

The researcher employed adequate care in selecting the variables of the study. Considering personal, economic, social and psychological factors of the rural community, time and resources availability to researcher, reviewing relevant literature and discussing with relevant expert, the researcher selected the variables for the study.

Ten characteristics of the respondents such as age, education, family size, farm size, annual family income, extension media contact, cosmopolitaness, knowledge on litchi cultivation, attitude towards litchi cultivation and innovativeness were considered as the causal variables of the study. Adoption of litchi cultivation by litchi farmers was the main focus of this study.

3.5 Measurements of the Variables

In order to conduct the study in accordance with the objectives it was necessary to measure the variables. The procedure for measuring the variables described below.

3.5.1 Age

Age of a farmer referred to the period of time from his birth to the time of interview. It was measured in terms of actual years on the basis of his statement. One (1) score was assigned for each year of his/her age.

3.5.2 Education

A respondent's educational score was measured on the basis of completed years of schooling. One (1) score was assigned for each completed year of schooling. If a respondent does not know reading and writing his/her score was assigned as zero (0). A score of 0.5 was assigned to a respondent who could sign his/her name only. Besides, the respondent got actual score of his/her every year of schooling i.e. 1 for class one, 2 for class two and so on.

3.5.3 Family size

Family size of a litchi farmers referred to the total number of members in his/her family including the respondent himself, his wife, sons, daughters and other members fully or partially dependent on him. The total number of family members were considered as the family size score of a respondent. For example, if a respondent has 6 members in his family, then his family size score was 6.

3.5.4 Farm size

Farm size was measured as the size of the respondent's farm on which he/she continued his/her farming operations during the period of study. The area was being estimated in terms of full benefit to the growers. The data were first recorded in terms of local unit i.e; bigha, katha or pakhi and then were converted to hectare and the size was measured by using the following formula:

$$FS = F_1 + F_2 + F_3 + \frac{1}{2} (F_4 + F_5) + G$$

Where,

FS = Farm size

F₁ = Homestead

F₂ = Own land under own cultivation

F₃ = Land taken from other on lease

F₄ = Land taken from other on borga

F₅ = Own land given to others on borga

G= Others/Pond/Garden

3.5.5 Annual family income

Annual income of a respondent was measured on the basis of total yearly earning from agricultural and non Agricultural sources (service, business, day labour etc.) by the respondent himself and other family members. The value of all the agricultural products encompassing litchi, crops, livestock, fisheries, fruits, vegetables etc, were taken into consideration. For calculation a score of one (1) was assigned for each one thousand taka of income.

3.5.6 Extension contact

Extension contact may be defined as one's extent of exposure to different communication media. The extent of contact was determined against 6 communication media by using five point (0-4) scale as follows:

Extension of contact	Assigned score
Not at all	0
Rarely	1
Occasionally	2
Often	3
Frequently	4

Logical frequencies of contact were considered for the all alternative responses as shown in item no. 6 of the interview schedule. The extension contact of a respondent was, therefore, determined by adding the total responses against 6 selected communication media. The extension contact score could range from 0 to 24, where 0 indicating no extension contact and 24 indicating very high contact.

3.5.7 Cosmopolitaness

A cosmopolitaness score was computed for each respondent to determine the degree of his exposure on the basis of his number of visit to different types of places. Each respondent was asked to indicate the number of visit to five different types of places according to the frequency of his visit to each type of places. Weights assigned to his responses were as follows:

Extent of visit	Assigned score
Not at all	0
Rarely	1
Occasionally	2
Often	3
Frequently	4

Logical frequencies of contact was assigned for the all alternative responses as shown in item no. 7 of the interview schedule. Cosmopolitaness score of a respondent was obtained by summing the weights for his visit to the 5 types of places. The cosmopolitaness score could range from 0 to 20, while 0 indicating no cosmopolitaness and 20 indicating high cosmopolitaness.

3.5.8 Knowledge on litchi cultivation

Litchi cultivation knowledge of a respondent was measured by asking 15 questions related to different aspect of litchi cultivation. It was measured in score. The total assigned scores for all the questions were 22 by assigning 1 to 3 for each question. Full score for each question was assigned for each correct answer, and 0 (zero) was assigned for the wrong answer; while partial score was assigned for each partially correct answer.

The knowledge score of a respondent could range from 0-22, where “0” indicating very poor knowledge and 22 indicating very high knowledge on litchi cultivation.

3.5.9 Attitude towards litchi cultivation

Attitude towards litchi cultivation was measured through a Likert type scale. Six statements on various aspects of litchi cultivation were asked to the farmers. The number of positive and negative questions was equal. They were asked to indicate for each of the statements, whether “strongly agree”, “agree”, “disagree” and “strongly disagree” and score were assigned as 4, 3, 2, and 1 respectively, if the statement was positive. A reverse scoring method was followed in case of negative statement. The attitude score of a litchi farmer was computed by summing the scores for his responses to all the items.

Hence, attitude score of a litchi farmers could range from 6 to 24; where 6 indicating very low favorable attitude and ‘24’ indicating very high favorable attitude towards litchi cultivation.

3.5.10 Innovativeness

Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in a social system (Rogers, 1995). Hence, innovativeness of a respondent was measured on the basis of the period of adoption of 5 improved technologies in litchi cultivation from the period he first listened about the innovation. Scores were assigned on the basis of time required by an individual to adopt each of the technology in the following manner:

Period of adoption	Assigned score
Within 1 st year of hearing	5
Within > 1 to 2 year of hearing	4
Within > 2 to 3 year of hearing	3
Within > 3 to 4 year of hearing	2
After 4 year of hearing	1
Not adopted at all	0

Thus the innovativeness score of a respondent was obtained by adding the score of all items and it ranged from 0 to 25, where 0 indicating no innovativeness and 25 indicating highest innovativeness.

3.5.11 Adoption of litchi cultivation

Adoption of litchi cultivation by the litchi farmers was the main focus of this study. The researcher selected 3 dimensions, which were considered in this investigation. These included:

- a) Area dimension
- b) Time dimension
- c) Recommended practices dimension

Area dimension: Area dimension was measured on the basis of percent area coverage by litchi cultivation as follows:

$$\text{Area dimension} = \frac{\text{Area used for litchi cultivation}}{\text{Area suitable for litchi cultivation}} \times 100$$

Then percentage of the area coverage was converted into score as follows:

% Area coverage	Score
1-25	1
26-50	2
51-75	3
76-100	4

Time dimension: Time subscore was measured by the following manner:

Duration of litchi cultivation	Score
Upto 10 years	1
>10-20 years	2
>20-30yars	3
>30 Years	4

Recommended practices dimension:

The extent of use of recommended practices was determined against firstly five (5) point scales as not use at all, up to one third use, more than one third to two third use, more than two third but less than fully use and fully use Scores was assigned as 0, 1, 2, 3 and 4 respectively for the alternative responses all the 10 selected recommended practices. Thus the extent of use of recommended practice score of a respondent was obtained by adding the score of all items and it ranged from 0 to 40. Then these score were further converted into recommended practices subscore by the following manner:

Extent of use of recommended practices score	Assigned score
0-10	1
11-20	2
21-30	3
31-40	4

So, adoption of litchi cultivation could measure by multiplying area subscore, time subscore and recommended practices subscore as follows:

Adoption of litchi cultivation = Area subscore \times Time subscore \times Recommended practices subscore. Thus adoption of litchi cultivation score of a respondent could range from 1-64, where 1 indicating low adoption and 64 indicating high adoption

3.6 Collection of data

The researcher himself collected data from the sample respondents through face to face interview using the pre-scheduled leisure period of respondent from 15 May to 07 July, 2017.

The researcher made all possible efforts to establish rapport with the respondents so that they could feel to respond to the questions contained in the schedule. Rapport was established with the farmers prior to interview and the objectives were clearly explained by using local language as far as possible. Interviews were conducted with the respondents in the home and tea shops during their off time. During the visit the objectives of the study were explained to most of the respondents. Brief information regarding the nature and purpose of the study was given to the respondents before actual

interview. Questions were asked systematically and explanations were made whenever it was necessary. The information was duly checked in order to minimize errors. Some data were recorded in local unit. These were subsequently converted to appropriate standard units. The respondents were interviewed at their off time so that they could give accurate information in a cool mind. The researcher in collecting data faced no serious problem. Excellent cooperation was obtained from the respondent during the data collection.

3.7 Statistical Treatment

Collected data were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. Qualitative data were quantified by means of suitable scoring techniques. The statistical measures such as range, frequencies and percentage distribution, mean and standard deviation were used to describe the variables. Tables were also used in presenting data for clarity of understanding and categorization of the respondents based on the nature of the variables. In order to explore the relationships of each of the selected characteristics of the farmers with their adoption of litchi cultivation, the Spearman rank Correlation Co-efficient was computed. Correlation matrix were also computed to determine the inter relationships among the variables. Five percent (0.05) level of significance was used as the basis of rejecting any null hypothesis. If the calculated value of co-efficient of correlation “r” was equal to or greater than tabulated value at designated level of significance for the relevant degrees of freedom, the null hypothesis was rejected and it was concluded that there was a significant relationship between the concerned variables. However, when the calculated value of co-efficient of correlation was found to be smaller than the tabulated value at the designated level of significance for the relevant degrees of freedom, it was concluded that the null hypothesis was accepted and hence, there was no relationship between the concerned variables. Co-efficient values significant at 0.05 level is indicated by single asterisk (*) and at 0.01 level by double asterisks (**).

3.8 Statement of Hypothesis

According to Kerlinger (1973), a hypothesis is a conjectural statement of the relation between two or more variables. Hypotheses are always in declarative sentence form and they relate either generally or specifically variables to sentence form and they relate

either generally or specifically variables to variables. Hypothesis may be broadly divided into two categories, namely, research hypothesis and null hypothesis.

3.8.1 Research hypothesis

The following research hypotheses were put forward to know the relationships between each of the ten selected characteristics of the litchi farmers and their adoption of litchi cultivation. "Each of the ten selected characteristics of the litchi farmers will have significant relationships with their adoption of litchi 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 each of the selected characteristics of litchi farmers and their adoption of litchi cultivation." The selected characteristics are age, education, family size, farm size, annual income, extension media contact, cosmopolitaness, knowledge on litchi cultivation, attitude towards litchi cultivation, and innovativeness. If a null hypothesis is rejected on the basis of a statistical test, it was assumed that there was a relationship between the concerned variables.

CHAPTER 4

RESULTS AND DISCUSSION

In this Chapter, the findings of the study and interpretation of the results have been presented. Data obtained from respondents by interview were measured, analyzed, tabulated and statistically treated according to the objectives of the study. These are presented in three sections according to the objectives of the study. The **first** section deals with the selected characteristics of the litchi farmers the **second** section deals with the extent of adoption of litchi cultivation by the farmers and the **third** section deals with the relationships between each of the selected characteristics of the litchi farmers and their extent of adoption of litchi cultivation.

4.1 Selected Characteristics of the Farmers

This section deals with the classification of the farmers according to their various characteristics. Behaviour of an individual is largely determined by his characteristics. These characteristics of an individual contribute to a great extent in the matter of shaping of his/her behaviour. In this section the finding on the farmers' selected characteristics have been discussed. The selected characteristics were (i) age, (ii) education, (iii) family size, (iv) farm size, (v) annual income, (vi) extension media contact, (vii) cosmopolitaness, (viii) knowledge on litchi cultivation, (ix) attitude towards litchi cultivation and (x) innovativeness. Therefore; the major hypothesis of the study was that the adoption of litchi cultivation would also be influence by selected characteristics of the farmers. Range, mean and standard deviations of these characteristics of the litchi farmers are also described in this section. Table 4.1 gives a summary profile of the farmers' selected characteristics.

Table 4.1 A summary profile of the farmers' selected characteristics

Sl. No.	Selected Characteristics	Scoring Method	Range		Mean	SD
			Possible	Observed		
01	Age	Actual Years	-	32-80	50.22	8.38
02	Education	Year of schooling	-	0-17	7.34	4.18
03	Family size	No. of member	-	3-10	5.54	1.48
04	Farm size	Hactare	-	0.10-3.0	0.67	0.66
05	Annual income	'000' Taka	-	110-2390	433.85	377.69
06	Extension media contact	Scores	0-24	3-15	9.15	2.32
07	Cosmopoliteness	Scores	0-20	3-19	14.18	2.29
08	Knowledge on litchi cultivation	Scores	0-22	8-20	13.50	2.89
09	Attitude towards litchi cultivation	Scores	6-24	13-21	18.30	1.43
10	Innovativeness	Scores	0-25	6-19	12.49	2.55

4.1.1 Age

Age of the farmers ranged from 32 to 80 years, the average being 50.22 years and the standard deviation of 8.38. On the basis of their age, the farmers were classified into three categories as shown in Table 4.2.

Table 4.2 Distribution of the farmers according to their age

Categories	Farmers	
	Number	Percent
Young aged (up to 35)	3	2.9
Middle-aged (36-50)	55	53.4
Old (>50)	45	43.7
Total	103	100

The highest proportion (53.4%) of the litchi farmers were felt in the "middle age" category, while 2.9 percent of them were young and only 43.7 percent were old. The findings again indicates that most of the farmers (97.1%) were middle to old aged. So, it was expected data that middle aged and old famers were more interested to adopt litchi cultivation than the younger of the study area.

4.1.2 Education

The education scores of the farmers ranged from 0 to 17. The average was 7.34 and the standard deviation was 4.18. On the basis of their educational scores, the litchi farmers were classified into four categories as shown in Table 4.3.

Table 4.3 Distribution of the farmers according to their education

Categories	Farmers	
	Number	Percent
Illiterate/can sign only (0-0.5)	16	15.50
Primary level (1-5)	15	14.60
Secondary level (6-10)	55	53.40
Above secondary level (>10)	17	16.50
Total	103	100.00

The findings reveal that more than two-third (69.9%) of the farmers had secondary to above secondary level of education. Therefore, it can be said that comparatively higher educated farmers were involved in litchi cultivation in the study area.

4.1.3 Family size

The family size of the litchi growers ranged from 3 to 10 members. The average was 5.54 with a standard deviation of 1.48. On the basis of their family size the farmers were classified into the following three categories as shown in Table 4.4.

Table 4.4 Distribution of farmers according to their family size

Categories	Farmers	
	Number	Percent
Small family (up to 4)	30	29.1
Medium family (5-7)	65	63.1
Large family (>7)	8	7.8
Total	103	100

Data presented in Table 4.4 revealed that the highest proportion (63.1%) of the farmers were felt under the medium family size category as compared to 29.1 percent small and 7.8 percent large family category. The findings also indicate that 92.2 percent of the respondents had small to medium family. The average family size (5.54) of the respondents of the study area was higher than the national average of 4.9 (BBS, 2003). This may be due to the lack of proper adoption of family planning measures among the respondents or the prevalence of joint family in the study area.

4.1.4 Farm size

The farm size of the respondents varied from 0.1 to 3.0 hectares. The average farm size was 0.67 hectare with a standard deviation of 0.66. The respondents were classified into the following three categories based on their farm size as shown in Table 4.5.

Table 4.5 Distribution of the farmers according to their farm size

Categories	Farmers	
	Number	Percent
Marginal farm (0.02- 0.2 ha)	18	17.5
Small farm (0.21-0.99 ha)	65	63.1
Medium farm (1.0-3.0 ha)	20	19.4
Total	103	100

The highest proportion of the farmers (63.1%) had small farms as compared to 19.4 percent of them had medium farms and only 17.5 percent had marginal farms. Thus, an overwhelming majority (82.5%) of the farmers were the owners of small to medium farms.

4.1.5 Annual income

The observed annual family income of the respondents ranged from 110 thousand Tk. to 2390 thousand Tk., the mean being 433.85 thousand Tk. and standard deviation of 377.69. Based on their income scores, the farmers were classified into three categories as shown in Table 4.6.

Table 4.6 Distribution of the farmers according to their annual income

Categories	Farmers	
	Number	Percent
Low income (upto 250)	35	34
Medium income (251-500)	42	40.8
High income (>500)	26	25.2
Total	103	100

From the 4.6 Table, the highest proportion (40.8%) of the respondents had medium annual family income as compared to 25.2 percent of them had high income and 34 percent had low income. Thus, all most three-fourth (74.80) of the respondents had low to medium annual income.

4.1.6 Extension media contact

The computed extension media contact scores of the respondents ranged from 3 to 15 with an average of 9.15 and a standard deviation of 2.32 against the possible range of 0 to 24. On the basis of their extension media contact scores, the farmers were classified into three categories as shown in Table 4.7.

Table 4.7 Distribution of the farmers according to their extension contact

Categories	Farmers	
	Number	Percent
Low extension contact (< Mean - 0.5sd, i.e. < 8)	26	25.2
Medium extension contact (Mean \pm 0.5sd, i.e. 8-10)	52	50.5
High extension contact (> Mean + 0.5sd, i.e. > 10)	25	24.3
Total	103	100

Half (50.5%) of the farmers had medium extension media contact, while 24.3 percent of them had high contact and 25.2 percent had low extension contact. Thus, about three-fourth (75.7%) of the farmers had low to medium extension media contact.

4.1.7 Cosmopolitaness

Cosmopolitaness scores of the respondents ranged from 3 to 19 with an average of 14.18 and a standard deviation of 2.29 against the possible range of 0 to 20. On the basis of their cosmopolitaness scores, the farmers were classified into three categories as shown in Table 4.8.

Table 4.8 Distribution of the farmers according to their cosmopolitaness

Categories	Farmers	
	Number	Percent
Low cosmopolite (< Mean - 0.5sd, i.e. < 14)	35	34
Medium cosmopolite (Mean \pm 0.5sd, i.e. 14-15)	43	41.7
High cosmopolite (> Mean + 0.5sd, i.e. > 15)	25	24.3
Total	103	100

The majority (41.7%) of the farmers were "medium cosmopolite" as compared to 34 percent of them being "low cosmopolite" and 24.3 percent "highly cosmopolite". Thus, almost all three-fourth (75.7%) of the farmers were low to medium categories in terms of their cosmopolitaness.

4.1.8 Knowledge on litchi cultivation

Litchi cultivation knowledge scores of the respondents ranged from 8 to 20 against the possible range of 0 to 22. The average and standard deviation were 13.50 and 2.89 respectively. Based on the observed litchi cultivation knowledge scores, the respondents were classified into two categories as shown in Table 4.9.

Table 4.9 Distribution of the famers according to their knowledge

Categories	Famers	
	Number	Percent
Medium knowledge (8-15)	77	74.8
High knowledge (>15)	26	25.2
Total	103	100

The highest proportion (74.8%) of the farmers had medium knowledge compared to 25.2 percent of them having high knowledge. Thus, in general the knowledge level of the farmers in the study area was quite satisfactory. Possession of comparatively medium to high knowledge is likely to be contributory to the adoption of litchi cultivation.

4.1.9 Attitude towards litchi cultivation

Attitude towards litchi cultivation of the respondents was quantified by computing scores for their attitude towards litchi cultivation. The attitude towards litchi cultivation scores ranged from 13 to 21 against the possible scores 6 to 24 with an average of 18.30 and a standard deviation of 1.43. Based on the observed attitude towards litchi cultivation scores, the respondents were classified into three categories as shown in Table 4.10.

Table 4.10 Distribution of the farmers according to their attitude towards litchi cultivation

Categories	Farmers	
	Number	Percent
Unfavourable (upto 15)	5	4.9
Low favourable (16-18)	46	44.6
Highly favourable (above 18)	52	50.5
Total	103	100

Data presented in Table 4.10 show that half (50.5%) of the litchi farmers belonged to highly favourable attitude towards litchi cultivation as compared to 44.6 percent had low favourable attitude and 4.9 percent had unfavourable attitude. The findings also reveal that an overwhelming majority (95.1%) of the respondents had low to high favourable attitude towards litchi cultivation.

4.1.10 Innovativeness

The maximum innovativeness score of the respondents was 19 and the minimum was 6 against the possible range of 0 to 25. However, the average was 12.49 and the standard deviation was 2.55. Based on their innovativeness scores, the respondents were classified into three categories as shown in Table 4.11.

Table 4.11 Distribution of the farmers according to their innovativeness

Categories	Farmers	
	Number	Percent
Low Innovativeness (< Mean - 0.5sd, i.e. < 12)	37	35.9
Medium Innovativeness (Mean \pm 0.5sd, i.e. 12-13)	30	29.1
High Innovativeness (> Mean + 0.5sd, i.e. > 13)	36	35
Total	103	100

Data contained in Table. 4.11 indicate that highest proportion (35.9%) of the farmers had low innovativeness as compared to 29.1 percent medium innovativeness and 35 percent high innovativeness. Data also revealed that majority (65 percent) of the respondent farmers of the study area had low to medium level of innovativeness.

4.2 Adoption of Litchi Cultivation

The adoption of litchi cultivation score of the farmers ranged from 12 to 48 against the possible range from 1 to 64. The average adoption score was 24.44 with a standard deviation of 8.76. Based on the possible adoption score, the farmers were classified into three categories as shown in Table 4.12.

Table 4.12 Distribution of the farmers according to their adoption of litchi cultivation

Categories	Farmers		Mean	SD
	Number	Percent		
Low adoption (1-21)	26	25.2	24.44	8.76
Medium adoption (22-43)	73	70.9		
High adoption (above 43)	4	3.9		
Total	103	100		

Data contained in Table. 4.12 indicated that highest proportion (70.9%) of the farmers had medium adoption as compared to 25.2 percent low adoption and only 3.9 percent had high adoption of litchi cultivation. Data also revealed that an overwhelming majority (96.1%) of the respondents farmers of the study area had low to medium level of adoption of litchi cultivation.

4.3 Relationships between the Selected Characteristics of the Litchi Farmers and their Adoption of Litchi Cultivation

Adoption of litchi cultivation was measured in ordinal scale. Therefore, Spearman Rank Correlation Co-efficient (r) was computed in order to find out the extent of relationship between each of selected characteristics of the litchi farmers and their adoption of litchi cultivation. To reject or accept the null hypothesis, 0.05 level of probability was used. Results of correlation have been shown in Table 4.12. Correlation co-efficient among all the variables might be seen in the correlation matrix in appendix-B.

Table 4.13 Spearman rank co-efficient of correlation showing relationships between each of the selected characteristics of the farmers and their adoption of litchi cultivation (N = 103)

	Selected characteristics of the litchi farmers	Value of co-efficient of correlation (r)	Tabulated value at 101 df	
			0.05 Level	0.01 Level
Adoption of litchi cultivation	Age	0.384**	0.194	0.254
	Education	0.250*		
	Family size	0.126 ^{NS}		
	Farm size	0.092 ^{NS}		
	Annual family income	0.029 ^{NS}		
	Extension media contact	0.059 ^{NS}		
	Cosmopolitaness	0.285**		
	Knowledge on litchi cultivation	0.284**		
	Attitude towards litchi cultivation	0.272**		
	Innovativeness	0.104 ^{NS}		

** Significant at the 0.01 level, * Significant at the 0.05 level, ^{NS} Not significant

4.3.1 Relationship between age of the litchi farmers and their adoption of litchi cultivation

The relationship between age of the litchi growers and their adoption of litchi cultivation was examined by testing the following null hypothesis:

“There is no relationship between age of the farmers and their adoption of litchi cultivation.”

Co-efficient of correlation between the concerned variables was found to be ‘r’ = 0.384 as shown in Table 4.13 This led to the following observations regarding the relationship between the two variables under consideration:

- ❖ The relationship showed a positive trend.
- ❖ The computed value of ‘r’ (0.384) was greater than the table value ($r = 0.254$) with 101 degrees of freedom at 0.01 level of probability.
- ❖ The concerned null hypothesis was rejected.

The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

Thus, the age of the litchi farmers had positive significant relationship with their adoption of litchi cultivation. Chouhan and Singh (2013), Pathak *et al.* (1992) observed the similar findings in their studies.

4.3.2 Relationship between the education of the litchi farmers and their adoption of litchi cultivation

The relationship between the education of the litchi farmers and their adoption of selected litchi cultivation was examined by testing the following null hypothesis:

“There is no relationship between education of the farmers and their adoption of litchi cultivation.”

The co-efficient of correlation between the concerned variables was found to be 'r' = 0.250 as shown in Table 4.13. This led to the following observations regarding the relationship between the two variables under consideration:

- ❖ The relationship showed a positive trend.
- ❖ The computed value of 'r' (0.250) was greater than the table value ($r = 0.194$) with 101 degrees of freedom at 0.05 level of probability.
- ❖ Hence, the concerned null hypothesis was rejected.
- ❖ The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.

Thus, education of the litchi farmers had positive and significant relationship with their adoption of litchi cultivation. Similar findings were also observed by Sardar (2002), Islam (2003), Hossain (2003), Hasan (2006), Nande and Basunthe (2009), Rao and Singh (2014) and Singh (2010).

4.3.3 Relationship between family size of the farmers and their adoption of litchi cultivation

The relationship between family size of the farmers and their adoption of selected litchi cultivation was examined by testing the following null hypothesis.

“There is no relationship between family size of the litchi farmers and their adoption of litchi cultivation.”

The co-efficient of correlation between the concerned variables was found to be 0.126 as shown in Table 4.13. This led to the following observations regarding the relationship between the two variables under consideration:

- ❖ The relationship showed a tendency in the positive direction between the concerned variables.
- ❖ The computed value of “r” (0.126) was smaller than the table value ($r = 0.194$) with 101 degrees of freedom at 0.05 level of probability.

- ❖ The co-efficient of correlation between the concerned variable was non significant at 0.05 level of probability.
- ❖ The null hypothesis was accepted.

The finding demonstrates that the family size of the farmers had no significant relationship with their adoption of litchi cultivation. It means that size of the farmers was not an important factor in adoption of litchi cultivation. Rahman (2001), Nande and Basunathe (2009), Rao and Singh (2014), Yadaw and Sharma (2012) observed the similar findings in their respective studies.

4.3.4 Relationship between farm size of the litchi farmers and their adoption of litchi cultivation

The relationship between farm size of the litchi farmers and their adoption of litchi cultivation was examined by testing the following null hypothesis.

“There is no relationship between farm size of the litchi farmers and their adoption of litchi cultivation.”

Computed value of the co-efficient of correlation between farm size of the farmers and their adoption of selected litchi cultivation was found to be ‘r’ = 0.092 as shown in Table 4.13. The following observations were recorded regarding the relationship between the two variables on the basis of the coefficient of correlation:

- ❖ The relationship showed a tendency in the positive direction between the concerned variables.
- ❖ The computed value of ‘r’ (0.092) was found to be smaller than the table value ($r = 0.194$) with 101 degrees of freedom at 0.05 level of probability.
- ❖ The concerned null hypothesis was accepted.
- ❖ The co-efficient of correlation between the concerned variable was non significant at 0.05 level of probability.

The findings imply that the farm size of the litchi farmers had no significant relationship with their adoption of selected litchi cultivation. Aurangozeb (2002) observed similar findings in his study.

4.3.5 Relationship between annual income of the litchi farmers and their adoption of litchi cultivation

The relationship between annual income of the litchi farmers and their adoption of litchi cultivation was examined by testing the following null hypothesis.

“There is no relationship between annual income of the litchi farmers and their adoption of litchi cultivation.”

Computed value of the co-efficient of correlation between annual income of the litchi farmers and their adoption of litchi cultivation was found to be $r = 0.029$ as shown in Table 4.13. The following observations regarding the relationship between the two variables on the basis of the coefficient of correlation:

- ❖ The relationship showed a tendency in the positive direction between the concerned variables.
- ❖ The computed value of r (0.029) was found to be smaller than the table value ($r = 0.194$) with 101 degrees of freedom at 0.05 level of probability.
- ❖ The concerned null hypothesis was accepted.
- ❖ The co-efficient of correlation between the concerned variable was non significant at 0.05 level of probability.

The annual income of the litchi farmers had no significant relationship with their adoption of litchi cultivation. Similar findings were observed by Sardar (2002) and Islam (2002).

4.3.6 Relationship between extension media contact of the litchi farmers and their adoption of litchi cultivation

The relationship between extension media contact of the litchi farmers and their adoption of litchi cultivation was examined by testing the following null hypothesis.

“There is no relationship between extension media contact of the litchi farmers and their adoption of litchi cultivation.”

The co-efficient of correlation between the concerned variables was found to be ‘r’= 0.059 as shown in Table 4.13. This led to the following observations regarding the relationship between the two variables under consideration:

- ❖ The relationship showed a positive trend.
- ❖ The computed value of ‘r’ (0.059) was smaller than the table value ($r = + 0.194$) with 101 degrees of freedom at 0.05 level of probability.
- ❖ The concerned null hypothesis was accepted.
- ❖ The co-efficient of correlation between the concerned variable was no significant at 0.05 level of probability.

Thus, the researcher concluded that the extension contact of the litchi farmers had no significant relationship with their adoption of litchi cultivation. Similar findings were observed by Alam (1997).

4.3.7 Relationship between cosmopolitanism of the litchi farmers and their adoption of litchi cultivation

The relationship between cosmopolitanism of the litchi farmers and their adoption of litchi cultivation was examined by testing the following null hypothesis:

“There is no relationship between cosmopolitanism of the litchi farmers and their adoption of litchi cultivation.”

The co-efficient of correlation between the concerned variables was found to be 'r'= 0.285 as shown in Table 4.13. This led to the following observations regarding the relationship between the two variables under consideration:

- ❖ The relationship showed a positive trend.
- ❖ The computed value of 'r' (0.285) was greater than the table value ($r = 0.254$) with 101 degrees of freedom at 0.01 level of probability.
- ❖ Hence, the concerned null hypothesis was rejected.
- ❖ The co-efficient of correlation between the concerned variable was positively significant at 0.01 level of probability.

The cosmopolitaness of the litchi farmers had positive and significant relationship with their adoption of litchi cultivation. Similar findings were observed by Rahman (2001), Hussien (2001), Hossain (2003), Gosh and Mitra (2008), Ziauddin and Gosami (2010), Yadaw and Sharma (2012) in their respective studies.

4.3.8 Relationship between knowledge on litchi cultivation and their adoption of litchi cultivation

The relationship between knowledge on litchi cultivation and their adoption of litchi cultivation was examined by testing the following null hypothesis:

“There is no relationship between knowledge of the litchi farmers and their adoption of litchi cultivation.”

Computed value of the co-efficient of correlation between knowledge on litchi cultivation and their adoption of litchi cultivation was found to be 'r' = 0.284 as shown in Table 4.13. The following observations regarding the relationship between the two variables on the basis of the coefficient of correlation:

- ❖ The relationship showed a positive trend.
- ❖ The computed value of 'r' (0.284) was found to be greater than the table value ($r = + 0.254$) with 101 degrees of freedom at 0.01 level of probability.

- ❖ The concerned null hypothesis was rejected.
- ❖ The co-efficient of correlation between the concerned variable was positively significant at 0.01 level of probability.

Thus, the knowledge on litchi farmers had positive significant relationship with their adoption of litchi cultivation. This finding indicates that adoption of litchi cultivation increases with the increase of knowledge of the farmers. Similar findings were observed by Sarder (2002), Ahmed (2006), Mahmud (2006), Mahmud (2006), Hasan (2006), Gosh and Mitra (2008), Singh (2010) and Devi (2013).

4.3.9 Relationship between attitude towards litchi cultivation of the litchi farmers and their adoption of litchi cultivation

The relationship between attitude towards litchi cultivation of the litchi farmers and their adoption of litchi cultivation was examined by testing following null hypothesis:

“There is no relationship between attitude of the litchi farmers and their adoption of litchi cultivation.”

Computed value of the co-efficient of correlation between attitude towards litchi cultivation of the litchi farmers and their adoption of litchi cultivation was found to be ‘ r ’ = 0.272 as shown in Table 4.13. The following observations regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- ❖ The relationship showed a positive trend.
- ❖ The computed value of ‘ r ’ (0.272) was found to be greater than the table value ($r = 0.254$) with 101degrees of freedom at 0.01 level of probability.
- ❖ Hence, the concerned null hypothesis was rejected.
- ❖ The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

Thus, the attitude towards litchi cultivation of the litchi farmers had positive significant relationship with their adoption of litchi cultivation practices. It could influence directly

to adopt litchi cultivation. Hasan (1996), Islam (2002) and Ahmed (2006) also found the similar findings in their studies.

4.3.10 Relationship between the innovativeness of the litchi farmers and their adoption of litchi cultivation

The relationship between innovativeness of the litchi farmers and their adoption of litchi cultivation was examined by testing following null hypothesis.

“There is no relationship between innovativeness of the farmers and their adoption of litchi cultivation.”

The co-efficient of correlation between the concerned variables was found to be ‘r’ = 0.104 as shown in Table 4.13. This led to the following observations regarding the relationship between the two variables under consideration:

- ❖ The relationship showed a positive trend.
- ❖ The computed value of ‘r’ (0.104) was smaller than the table value ($r = 0.194$) with 101 degrees of freedom at 0.05 level of probability.
- ❖ Hence, the concerned null hypothesis was accepted.
- ❖ The co-efficient of correlation between the concerned variable was non significant at 0.05 level of probability.

So, the innovativeness of the litchi farmer had no significant relationship with their adoption of litchi cultivation practice. Similar findings were observed by Hossain (1999), Rao and Singh (2014) in their respective studies.

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

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

5.1 Summary of Findings

The major findings of the study are summarized below:

5.1.1 Selected characteristics of the farmers

Age: Highest proportions (53.4%) of the farmers were middle aged Category as compared to 2.9 percent being young and 43.7 percent old aged.

Education: The highest proportion (53.4%) of the farmers had “secondary compared to 15.5 percent having “ illiterate”, 14.6 percent having “primary education” and 16.5 percent having “above secondary education”.

Family size: The highest proportion (63.1%) of the farmers had medium family size compared to 29.1 percent small and 7.8 percent large family size categories.

Farm size: The highest proportion (63.1%) of the farmers had small farm size compared to 19.4 percent having medium farm size and 17.5 percent having marginal farm size.

Annual family income: The highest proportion (40.8%) of the farmers had medium income as compared to 34 percent low income and 25.2 percent under high income categories.

Extension media contact: The highest proportion (50.5%) of the respondents had medium extension contact as compared to 25.2 percent having low and 24.3 percent having high extension media contact.

Cosmopolitaness: The highest proportion (41.7%) of the farmers had medium cosmopolitaness compared to 34 percent having low cosmopolitaness and only 24.3 percent having high cosmopolitaness.

Knowledge on litchi cultivation: The highest proportion (74.8%) of the farmers had medium knowledge on litchi cultivation as compared to 25.2 percent high knowledge on litchi cultivation.

Attitude towards litchi cultivation: The highest proportion (50.5 %) of the respondents had high favourable attitude towards litchi cultivation compared to 44.6 percent having low favourable and 4.9 percent having unfavourable attitude towards litchi cultivation.

Innovativeness: The highest proportion (35.9%) of the farmers had low innovativeness as compared to 35 percent having high innovativeness and 29.1 percent having medium innovativeness.

5.1.2 Adoption of litchi cultivation

The highest proportion (70.9%) of the farmers had medium adoption category while 25.2 percent had low adoption and only 3.9 percent had high adoption of litchi cultivation.

5.1.3 Relationship between the selected characteristics of the litchi farmers with their adoption of litchi cultivation

Age, education, cosmopolitaness, knowledge on litchi cultivation and attitude towards litchi cultivation of the farmers had significant positive relationship with their adoption of litchi cultivation. Other variables like family size, farm size, annual family income, extension media contact and innovativeness of the farmers had no significant relationship with their adoption of litchi cultivation.

5.2 Conclusions

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

- ❖ Majority (70.9%) of the farmers had medium adoption of litchi cultivation. Therefore, it may concluded that the adoption behavior of the farmers in respect of litchi cultivation presents a promising picture, but there is further scope for increasing the extent of adoption of litchi cultivation.

- ❖ Age of the farmers had a significant positive relationship with the adoption of litchi cultivation. Therefore, it was concluded that there is a good ground for increasing adoption of litchi cultivation among the young farmers in the study area.
- ❖ Education of the farmers had a significant positive relationship with the adoption of litchi cultivation. Therefore, it was concluded that any arrangement made to increase the level of education would ultimately increase the adoption of litchi cultivation.
- ❖ Cosmopolitaness of the litchi farmers had significant positive relationship with the adoption of litchi cultivation. Therefore, it was concluded that any arrangement made to increase the cosmopolitaness would ultimately increase the adoption of litchi cultivation.
- ❖ Knowledge on litchi cultivation had a significant positive relationship with the adoption of litchi cultivation. Therefore, it was concluded that any arrangement made to increase the knowledge would ultimately increase the adoption of litchi cultivation.
- ❖ Attitude towards litchi cultivation had a significant positive relationship with the adoption of litchi cultivation. Therefore, it was concluded that any arrangement made to increase the favorable attitude towards litchi cultivation would ultimately increase the adoption of litchi cultivation.

5.3 Recommendations

5.3.1 Recommendations for policy implications

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

- ❖ Majority of the farmers had medium adoption of litchi cultivation. Therefore, it may be recommended that agricultural extension agencies especially the DAE and relevant NGOs should strengthen their extension services to the litchi farmers to motivate them for adoption of litchi cultivation
- ❖ Age had a positive relationship with the adoption of litchi cultivation. Therefore it was recommended that DAE should target young farmers to increase adoption of litchi cultivation.
- ❖ Education had a positive relationship with the adoption of litchi cultivation. Therefore, it was recommended that step should be taken by the government to increase level of education for increasing adoption of litchi cultivation.
- ❖ Cosmopolitenss had a positive relationship with the adoption of litchi cultivation. Therefore, it was recommended that steps should be taken to increase the cosmopoliteness of the farmers for increasing adoption of litchi cultivation.
- ❖ Knowledge had a positive relationship with the adoption of litchi cultivation. Therefore, it was recommended that DAE and other extension providing organizations should take necessary action to increase the knowledge of the farmers for enhancing their adoption of litchi cultivation.
- ❖ Attitude had a positive relationship with the adoption of litchi cultivation. Therefore, it was recommended that DAE and other extension providing organizations should arrange motivational campaigning to develop favorable attitude for increasing adoption of litchi cultivation.

5.3.2 Recommendations for further study

A small piece of study can not provide all information for the proper understanding of the adoption of litchi cultivation. Therefore, the following suggestions are made for further study:

- ❖ The present investigation explored the relationships of the ten selected characteristics of the litchi farmers with their adoption of litchi cultivation. Further research may be conducted by taking other characteristics to observe relationships with their adoption of litchi cultivation.
- ❖ The present study was conducted in Auliapur and Chehelgazi unions under Sadar upazila of Dinajpur district. So, similar studies may be undertaken in other parts of the country to verify the findings of the present study.
- ❖ Relationships of ten selected characteristics of the litchi farmers with their adoption of litchi cultivation have been investigated in this study. Future research should be conducted to investigate other characteristics of the farmers in adoption of other crop cultivation.
- ❖ The study was confined among the litchi farmers only. Further study needs to be conducted among the general farmers.

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Appendix-A
Department of Agricultural Extension & Information System
Sher-e-Bangla Agricultural University, Dhaka.
INTERVIEW SCHEDULE FOR A RESEARCH STUDY
ON
ADOPTION OF LITCHI CULTIVATION BY THE FARMERS OF DINAJPUR
DISTRICT

Serial no

Name of the respondent

Village Union Upazila.....

District Contact Number

Please answer the following questions

1. Age

How old are you? Years.

2. Education

Please mention your educational background

- a) Can not read and write (.....)
- b) Can sign only (.....)
- c) I studied up to class (.....)

3. Family size

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

4. Farm size

Please indicate your farm size on the following head:

Sl. No.	Types of land	Land area	
		Local unit	Hectare
1	Homestead		
2	Own land under own cultivation		
3	Land taken from others on lease		
4	Land given to others on borgha		
5	Land taken from others on borgha		
6	Others/pond/garden		
Total			

5. Annual family income

Please mention your last year income from different sources.

Sources of income		Area	Production	Income	Total amount in (TK)
A. Agriculture					
1.	Litchi				
2.	Rice				
3.	Litchi				
4.	Maize				
5.	Jute				
6.	Pulse				
7.	Oil crops				
8.	Vegetables				
9.	Fruits				
10.	Spices				
11.	Livestock				
12.	Poultry				
13.	Fisheries				
B. Non Agriculture					
1.	Business				
2.	Service				
3.	Day labor				
4.	Others				
Grand Total					

6. Extension media contact: Please indicate the nature of your extension media contact. (Give tick (√) mark in the right place.)

Sl. No.	Name of the media	Frequently	Often	Occasionally	Rarely	Not at all
01	Contact with SAAO	>3 times/month	3 times/month	2 times/month	1 time/month	0 time/month
02	Contact with model farmers	>3 times/month	3 times/month	2times/Month	1 time/month	0 time/month
03	Contact with neighbor	>6 times/month	5-6 times/month	3-4 times/month	1-2 times/month	0 time/month
04	Watching TV Programme	>6 times/month	5-6 times/month	3-4 times/month	1-2 time/month	0 time/month
05	Listening krishi radio Programme	>6 times/month	5-6 times/month	3-4 times/month	1-2 time/month	0 time/month
06	Reading agriculture poster, booklet and bulletin etc	>6 times/year	5-6 times/year	3-4 times/year	1-2 time/year	0 time/year

7. Cosmopolitaness

Please mention the frequencies of visits in the following places. (Please tick mark in right space)

Sl. No.	Name of visit	Frequency of visit				
		Regularly	Often	Occasionally	Rarely	Not at all
01	Upazila Agriculture office	>3 times/year	3 times/year	2 times/year	1time/year	0 time/year
02	Attend field days at block level	>3 times/year	3 times/year	2 times/year	1time/year	0 time/year
03	Attend result demonstration meetings at block	>3 times/year	3 times/year	2 times/year	1time/year	0 time/year
04	Upazila Agriculture fair	>1time/Year	1time/2-3 Years	1times/4-5 Years	1time/>5 years	0 time/year
05	District Agriculture fair	>1time/Year	1time/2-3 Years	1times/4-5 Years	1time/>5 years	0 time/year

8. Knowledge on litchi cultivation

Please answer the following questions

Sl. No.	Questions	Score	
		Weighted	Obtained
1.	Mention the name of two improved varieties of litchi	1	
2.	Which type of land is suitable for litchi cultivation?	1	
3.	Mention the planting distance of litchi cultivation.	1	
4.	What do you mean by air layering?	1	
5.	What fertilizer need to use in pit for litchi plantation?	2	
6.	Mention the name of two insects of litchi	1	
7.	How can you control litchi fruit borer?	2	
8.	Why litchi fruit crack?	1	
9.	How can you control powdery mildew of litchi?	2	
10.	What measures can be taken for protecting litchi fruits from birds?	1	
11.	Mention the causes of fruit dropping.	2	
12.	How can you apply fertilizer in adult litchi trees?	3	
13.	Why pruning is necessary in litchi trees?	1	
14.	How can you control litchi mite?	2	
15.	Mention harvesting time of litchi.	1	
Total		22	

9. Attitude towards litchi cultivation

Please indicate your agreement with the following statement.

Sl. No.	Statement	Extent of agreement / disagreement			
		Strongly Agree	Agree	Disagree	Strongly Disagree
01(+)	Litchi cultivation is highly profitable.				
02(-)	Litchi cultivation is complex.				
03(+)	Pest infestation is less in litchi cultivation.				
04(+)	Less irrigation is required for litchi cultivation.				
05(-)	Litchi orchard can give return for long time.				
06(-)	Litchi orchard maintenance cost is high				

10. Innovativeness

Sl. No.	Name of technology	Duration of adoption					Not adopted at all
		Within 1 st year of hearing	Within > 1 to 2 year of hearing	Within > 2 to 3 year of hearing	Within > 3 to 4 year of hearing	After 4 year of hearing	
1.	Use of improved litchi varieties(BARI litchu-3, BARI litchu-4)						
2.	Use of air layering for propagation						
3.	Use of hormones						
4.	Mulching in litchi garden						
5.	Intercropping in litchi orchard						

11. Adoption of litchi cultivation

A. Area dimension

Mention area you are using for litchi cultivation

Suitable area for litchi cultivation (hectare)	Actual area used for litchi cultivation (hectare)

B. Time dimension

How many years you are cultivating litchi ?years

C. Use of recommended practices dimension

SL. No.	Name of the practices	Fully use	More than two third but less than fully use	More than one third to two third use	Up to one third use	Not use at all
		(100%)	(>66 -< 100%)	(> 33%- 66%)	(0-33%)	
01.	Recommended varieties(BARI lichu-3,BARI lichu-4,Bedana, Bombai)					
02.	Recommended spacing (8-10 m)					
03.	Recommended dose of cowdung for adult tree					
04.	Recommended dose of urea for adult tree					
05.	Recommended dose of TSP for adult tree					
06.	Recommended dose of MOP for adult tree					
07.	Recommended dose of gypsum for adult tree					
08.	Recommended dose of zinc sulphate for adult tree					
09.	Recommended irrigation 6 times(3 times after flower initiation and 3 times after fertilizer application)					
10.	Recommended pest and physiological disorder management (4 pest and 2 physiological disorder)					

Thanks for your participation.

Dated

Signature of respondent

Appendix-B
CORRELATION MATRIX AMONG THE VARIABLES OF THE STUDY

Variables	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	Y
X ₁	1										
X ₂	-.039 ^{NS}	1									
X ₃	.444**	-.126 ^{NS}	1								
X ₄	.324**	.143 ^{NS}	.059 ^{NS}	1							
X ₅	.153 ^{NS}	.183 ^{NS}	.003 ^{NS}	.445**	1						
X ₆	-.077 ^{NS}	.199*	- .182 ^{NS}	.143 ^{NS}	.229*	1					
X ₇	.009 ^{NS}	.202*	- .130 ^{NS}	.102 ^{NS}	.034 ^{NS}	.204*	1				
X ₈	.156 ^{NS}	.434**	- .043 ^{NS}	-.043 ^{NS}	.069 ^{NS}	.090 ^{NS}	.069 ^{NS}	1			
X ₉	.138 ^{NS}	.044 ^{NS}	.120 ^{NS}	.120 ^{NS}	- .120 ^{NS}	- .079 ^{NS}	-.005 ^{NS}	-.095 ^{NS}	1		
X ₁₀	.238*	.017 ^{NS}	.070 ^{NS}	.070 ^{NS}	- .031 ^{NS}	.204*	.137 ^{NS}	-.001 ^{NS}	.037 ^{NS}	1	
Y	.384**	.250*	.126 ^{NS}	.126 ^{NS}	.029 ^{NS}	.059 ^{NS}	.285**	.284**	.272**	.104 ^{NS}	1

NS=Correlation is not significant, * Correlation is significant at the 0.05 level (2-tailed),
** Correlation is significant at 0.01 level

X₁ = AGE

X₂ = EDUCATION

X₃ = FAMILY SIZE

X₄ = FARM SIZE

X₅ = ANNUAL INCOME

X₆ = EXTENSION CONTACT

X₇ = COSMOPOLITENESS

X₈ = KNOWLEDGE ON LITCHI CULTIVATION

X₉ = ATTITUDE TOWARDS LITCHI CULTIVATION

X₁₀ = INNOVATIVENESS

Y = ADOPTION OF LITCHI CULTIVATION