

PROBLEMS FACED BY THE FARMERS IN COTTON CULTIVATION

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**PROBLEMS FACED BY THE FARMERS IN COTTON
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CERTIFICATE

This is to certify that thesis entitled, “**PROBLEMS FACED BY THE FARMERS IN COTTON CULTIVATION**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in AGRICULTURAL EXTENSION & INFORMATION SYSTEM**, embodies the result of a piece of *bona fide* research work carried out by **S.M. ABDUL BATEN**, Registration No.12-05228 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 duly been acknowledged.

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Place: Dhaka, Bangladesh

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ABBREVIATIONS

CDO	=	Cotton Development Officer
BBS	=	Bangladesh Bureau of Statistics
<i>et al.</i>	=	All others
etc.	=	et cetera, and the other
GDP	=	Gross Domestic Product
HYV	=	High Yielding Variety
PFI	=	Problem Faced Index
SAAO	=	Sub-Assistant Agricultural Officer
CIS	=	Commonwealth of Independent States
USA	=	United States of America
FFS	=	Farmers Field School
IPM	=	Integrated Pest Management
DAE	=	Department of Agricultural Extension

ABSTRACT

The purpose of the study was to find out the extent of problems faced by the farmers in cotton cultivation and to explore the relationships of the farmers' selected characteristics with their problems faced in cotton cultivation. The study was conducted in 8 selected unions under five upazilla as namely Dhamrai from Dhaka, Sadar and Satoria from Manikgong, and Nagarpur and Mirzapur from Tangail districts. Data were collected from a proportionately random sample of 116 cotton farmers by using an interview schedule during the period from 10 January, 2014 to 15 February, 2014. The majority (73.3 percent) of the farmers faced medium problem in cotton cultivation, while 16.4 percent low and 10.3 percent high problem in cotton cultivation. Correlation analysis indicated that among 12 selected characteristics of the farmers, 08 namely, education, land possession, cotton cultivation area, input availability, innovativeness, extension media contact, training exposure and cotton cultivation knowledge had significant negative relationship with their problem faced in cotton cultivation and the rest 04 characteristics namely, age, family size, annual family income, credit availability had no significant relationship with their problem faced in cotton cultivation. On the basis of Problem Faced Index, it was observed that "Long duration of cotton cultivation" ranked first followed by "Low price of cotton", "Adverse climate", "High price of pesticides" were the major four problems in cotton cultivation.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Along with food and shelter, clothing is one of the primary requirements of human beings. Cotton, unique among agricultural crops provides food and fiber. Cotton is a major natural fiber crop. Its seeds provide edible oil and oil cakes used for livestock feed.

Because of being a rural based agricultural country Bangladesh has remarkable contribution in agricultural sectors especially in rice, vegetables, fruits and fish production during last three decades. Bangladesh is highly populated country, so our attention was to produce food to feed the people. Presently Bangladesh has reached to a sustainable level of food production. Now the Government is going to crop diversification which is more profitable for the farmers. Cotton is now one of the high value crops by introducing hybrid and Bt hybrid production.

The cultivation of cotton (*Gossypium spp.*) and its manufactures into textile has been practiced in this region since prehistoric time. The finest cotton fiber-Moslin once produced in medieval Bengal was famous through-out the world. The cotton for producing Moslin was grown on highlands around Dhaka where most Moslin handlooms were located. However, the production and trading of Moslin gradually declined during the British rule ultimately resulting to closure of the industry by early nineteenth century. Later on, the British Government attempted revival of cotton production in India and introduced American variety of cotton(*Gossypiumhirsutum*) but the farmers didn't accept cotton as a commercial crop in Bengal.

Cotton is the major textile fiber used by the human race in the world and playing a key role in economic and social welfare. Cotton cultivated more than 80 countries of the world represents 2.5% of all cultivated land but among these, 10 countries-China, U.S.A , Russia, India, Brazil, Pakistan, Turkey, Egypt, Mexico and Sudan are accounted for 85-

90 % of the total production. The seed of cotton that produced both for food and industrial uses and as a residual product, cotton seed meal, that is high protein used as fish and livestock feed. After harvest of cotton, the plant is widely used as fuel wood that is scarce in Bangladesh.

Among the various field crops, cotton occupies a unique position in most of the Asian countries. It sustained millions of people for their livelihood at farms, ginning factories, textile mills, edible oil and soap factory, etc. Cotton is, therefore, rightly called the lifeblood of economy of many countries in Asia.

Two types of cotton are grown in Bangladesh namely (i) American upland cotton (*Gossypium hirsutum*) and (ii) Hill cotton (*Gossypium arboreum*). Upland cotton is cultivated in the south western region, northern region and central region covering more than 32 districts out of 61 plain districts of Bangladesh. The course type hill cotton, on the other hand, is grown in 3 hill districts. Hill cotton is an indigenous variety and cultivated in Jhum system as mixed crop but as it is grown in Jhum with many crops, it gives very low yield and less economic benefit. To increase yield and economic benefit, the American upland cotton has been introduced in 3 hill districts recently as rice-cotton intercropping, an alternative option for the hill farmers.

Bangladesh cotton: Current scenario

- Second largest apparel producer of the world
- Bangladesh is the 5th largest raw cotton consumer in the world
- 2nd highest raw cotton importer of the world
- Raw cotton import from-Uzbekistan, India, USA, other CIS and some African countries
- Quality of domestic cotton is equivalent to CIS and Indian cotton

- Hybrid cotton has been introduced and Bt cotton introduction is under process (Global Cotton Summit Bangladesh 2015).

Textile sector of Bangladesh:

The present textile sector of Bangladesh showed in table 1.1.

Table1.1.Textile sector of Bangladesh

Spinning mills	393 No.s (appox)
Annual production of yarn	1,800 million Kg
weaving Mills	1,343 No.s
Annual production of Woven fabric	1,000 million meters
Knit industries	446 Nos.
Annual production of knit fabric	5,200 million meters
Ready- made garment(RMG) units	5,000 Nos.
Handlooms	3 lakhs Nos
Annual production capacity of handlooms	92 million meters
Employment of laborers in textile sector	5 million
Annual requirement of raw cotton	4.20-4.50 million bales
Total yearly expenses for import of cotton	Tk.12,000 crores

Source:Global Cotton Summit Bangladesh 2015

Requirement and Source of cotton

Annual requirement of raw cotton for textile industry of Bangladesh is 40-42 lac bale (1 bale = 182 kg or 400 pounds). Around 3-5 % of the national requirement is fulfilled through the local production(0.1 million bales), remaining 95-96% requirement is

fulfilled by importing raw cotton from Uzbekistan(33%), India(33%), USA(13%), African countries (11%), Turkmenistan (6%), Australia(5%) and Pakistan (4%). (Global Cotton Summit Bangladesh 2015)

Cotton cultivation in Bangladesh

Cotton is growing mainly in south eastern zone. middle zone and northern part of Bangladesh. It covers 32 districts of Bangladesh mainly Kushtia, Chuadanga, Jhenaidah, Meherpur, Magura, Jessore, Rangpur and Thakurgaon. After introduction of Chinese hybrid, cotton is the most economic crop in those areas. Now the total production is 150000 bales per year.

Cotton(*Gossypium Spp.*) is the second important cash crop in Bangladesh after jute. It is the main raw materials of textile industries. The area, production and yield of cotton per hector in Bangladesh for the last six years are shown in figure 1.1.

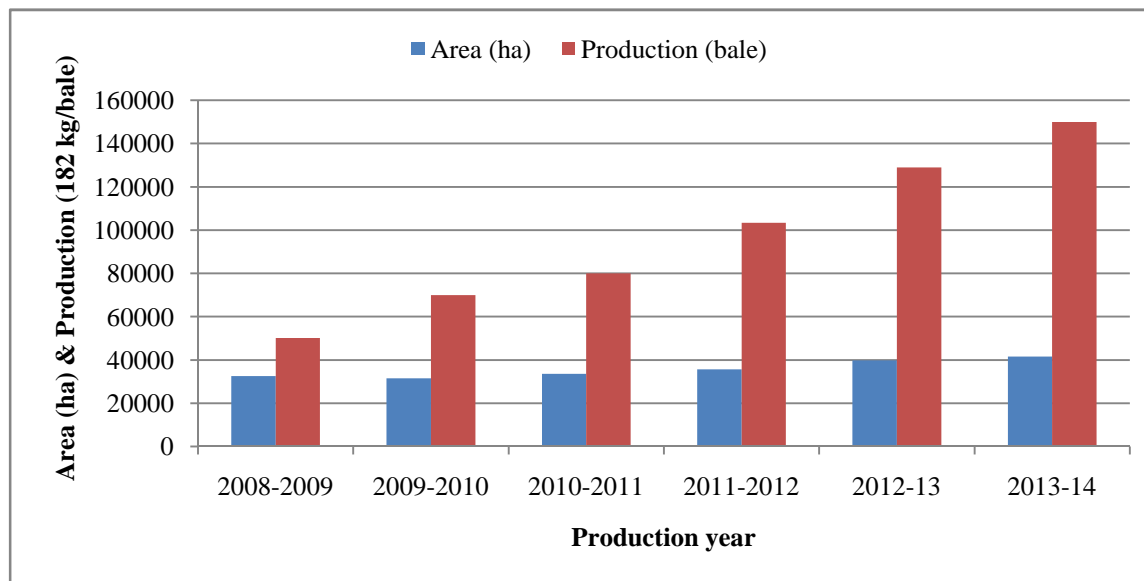


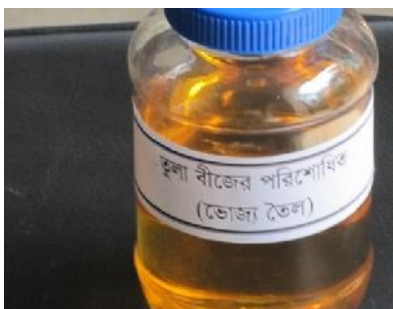
Figure 1.1. Area and production of cotton from 2008-2009 to 2013-2014 cropping seasons in Bangladesh(Global Cotton Summit Bangladesh 2015)

Important value from cotton by products: (Cotton oil, Oil cake)

Cotton oil is one of the important edibles used in many countries of the world which is lower in cholesterol than Soyabean. Bangladeshi private ginners established expeller and refinery in Kushtia(Figure.1.2) and Jhenaidah and have started marketing of cotton seed oil, very shortly they are going to branding of cotton seed oil.



Figure.1.2 Cotton oil refinery at Kushtia



Locally produced edible oil from cotton seed



Locally produced oil cake from cotton seed

Cotton oil cake is a byproduct of cotton seed and it is produced during well extraction. The oil cake is generally used for livestock feeding and fish feed. Cotton oil cake has high demand in the market for multiple uses with high percentage of protein. Cotton oil cake is also used as organic fertilizer like mustard oil cake. Even it is better than mustard oil cake.

But in spite of very promising and huge amount of foreign currency saving cash crop, the farmers are not that much interested interested to cultivate cotton because of several major and minor problems. A very few researchers tried to find out the problems in cotton cultivation. Therefore, the present researcher felt necessity to conduct the research entitled, "Problems Faced by the Farmers in Cotton Cultivation".

1.2 Statement of the problem

Problems of the cotton farmers about cotton cultivation means the difficulties that the farmers face in long duration, low price of cotton, adverse climate, pest attack, lack of high yielding varieties, unavailability of pesticides, fertilizers and irrigation water, unavailability of labor, difficulties of getting loans, high bank interest, lack of training facilities, need high crop management, lack of proper knowledge, lack of marketing facilities, undue flood, high price of pesticides and fertilizers. Cotton is only the valuable cash and fiber crop that has a big opportunity to keep contribution in the world's second largest textile sector of Bangladesh saving 13-15 thousand crore foreign currency. Very

practically this crop should stay a very sensitive and important consideration in the agricultural fields of Bangladesh. It is, therefore, important and essential to preserve clear and good understanding on problems faced by the farmers in cotton cultivation at field level.

In many cases cotton farmers are not familiar with modern technologies and management practices of cotton cultivation. Most of the farmers are unable to understand the behavior and physiology of cotton. As a result, they failed to take necessary steps in due time of adverse situations as well as management practice. Finally their yield decreases and they begin to lose interest of cotton cultivation and migrate from cotton. So behind their migration from cotton many problems faced by the farmers are responsible. Therefore, a research study entitled, "problem faced by the farmers in cotton cultivation" was undertaken.

Considering the problems faced in cotton at field level, this study should be designed to find out the following research questions:

1. What are the different characteristics of the farmers?
2. What is the extent of problems faced by the farmers in cotton cultivation?
3. Is there any relationship between the farmers' problems faced in cotton cultivation and their selected characteristics?
4. What are the levelsof severities of the different problems faced by the farmers in cotton cultivation?

1.3 Specific Objectives

The following specific objectives were formed to give proper direction to the study:

1. To assess the extent of problems faced by the farmers in cotton cultivation.
2. To assess following selective characteristics of cotton farmers.
 - Age
 - Education

- Family size
 - Land possession
 - Cotton cultivation area
 - Annual family income
 - Credit availability
 - Input availability
 - Extension media contact
 - Innovativeness
 - Training Exposure
 - Cotton Cultivation Knowledge
3. To explore the relationship of the problems faced by the farmers in cotton cultivation with their selected characteristics.
 4. To compare among the severity of problems faced by the farmers in cotton cultivation.

1.4 Justification of the study

It is stated that cotton is the valuable cash and fiber crop of Bangladesh. In the world, Bangladesh is the second largest country in textile sector. To fulfill the demand of these huge textile sector, Cotton Development Board, the only Government body for providing technological support to the cotton farmers is capable a little to supply raw cotton(2-3%) of the total demand. So, Bangladesh expends a huge money(12-15 thousand croreTk.) to collect raw cotton from foreign countries. To save this huge money, cotton cultivation in Bangladesh must be increased. But increasing of cotton cultivation depends on raising the yield per unit area. Because yield is the most important parameter to sustain the long durable crops, cotton. So the research thinking and effort is determined to produce more cotton by increasing its yield from less land. Thus, area of cotton should be increased. In this way the farmers will not only be benefited, but also they would be able to play a vital role in the national economic development. But different problems act adversely in the cultivation of cotton.

It is therefore, urgently necessary to devise ways and means to increase cotton cultivation through identifying the problems and by minimizing the problems.

The findings of the study are expected to be useful to the planners, research personnel and extension workers in planning and execution of cotton extension programs in a better way.

1.5 Assumption of the study

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

1. The respondents included in the sample for this study were competent enough to furnish proper responses to the queries included in the interview schedule.
2. The researcher who acted as interviewer was adjusted to social and environmental conditions of the study area. Hence, the data collected by him from the respondents were free from bias.
3. The responses furnished by the respondents were valid and reliable.
4. Views and opinions furnished by the cotton growers included in the sample were the representative views and opinions of the whole population of the study area.
5. The findings of the study might have general application to other parts of the country with similar personal, socio-economic and cultural condition of the study area.

1.6 Scope of the study

The findings of the study will be particularly applicable to the study area. However, the findings may also have generally implications for other areas of Bangladesh, where socioeconomic, physical, cultural and geographical conditions are mostly similar to the study area. Thus, the findings are expected to be useful to students, researchers, extension workers and particularly for planners in formulating future plans related to nation building activities. The findings may be a piece of contribution to the body of knowledge in the field of agricultural extension services.

1.7 Limitations of the study

The objective of the study was to make an understanding of the problem faced in cotton cultivation by the cotton farmers. However, from the research point of view, it was necessary to impose certain limitations as follows:

1. The study was conducted on only 08 selected unions under 05 Upazillas of 03 districts.
2. Farmers have many varied characteristics but only 12 were selected to complete this study as stated in the objectives.
3. Population for the present study was kept confined within the heads of the cotton cultivated families. Because they were the major decision makers regarding cotton cultivation.
4. The researcher dependent on the data as furnished by the selected farmers during interview.

1.8 Definition of terms

In this study, the certain terms have been frequently used. These are defined and interpreted below for clarity of understanding.

Age

Age of the respondent refers to the period of the time from his birth to the time of interview in years.

Education

Education was considered as the formal education of the respondent by the number of years spent to obtain formal education through successful schooling.

Family size

It was considered as the actual number of permanent members in a respondent's family including himself, his wife, children and others that live and eat together in a family unit.

Land possession

Land possession has been measured as the total cultivated area that the respondent used for his farming operations owned by himself or obtained from others. The area was estimated in terms of full benefit or half benefit to the person. If the cultivated area was either owned by him or obtain on lease from others was considered as full benefit. But if the respondent took the land from others as barga or gave his land to others for cultivation on barga basis then this has been considered as half benefit. It was expressed in hectare.

Cotton cultivation area

It refers to the cultivation areas of the respondents on which they and their family operate cotton cultivation and is expressed in hectare.

Annual family income

It was considered as the total annual earnings by the all earning family members of the respondent from cotton, other crops, poultry, livestock, fisheries, business, service, daily labor and other accessible sources during one year.

Credit availability

Credit availability of a respondent refers to the demand of cash money treated as loan for cotton cultivation received from institutional or non institutional sources by the respondent during the sowing season. It was expressed in percentage.

Input availability

Some elements are essential for cotton cultivation but for successful cultivation farmers must need these elements in proper time. This is considered as input availability. It includes availability of modern variety, availability of fertilizers, availability of pesticides, availability of irrigation water, availability of seed treatment chemical etc.

Innovativeness

Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in a social system(Rogers,1995). This has been defined as the quickness of accepting innovation by the respondent in relation to others and also was measured on the basis of time dimension.

Extension media contact

Extension media contact refers to the respondents' participation directly or indirectly for collecting information from different sources that are used technology dissemination among the farmers.

Training exposure

This has been determined as the number of days attended by the respondent in his whole life to the training courses on various agriculture related subject matters including cotton cultivation.

Cotton cultivation knowledge

Cotton cultivation knowledge of the farmers refers to the clear conception of the cotton farmer about different subjects of cotton cultivation. This includes the basic understanding about the use of different inputs of cotton cultivation and practice and knowledge about cotton.

Problem faced

Problem is the difference between desired situation and the present situation of a matter. Problem faced refers to facing difficulties to do any work. Problem faced by the farmers in cotton cultivation means degree to facing difficulties in various management practices of cotton cultivation from seed to seed of cotton.

CHAPTER 2

REVIEW OF LITERATURE

The aim of this Chapter is to describe the review of past researches conducted in line of the major focus of this study. Literature having relevance to the present study has been reviewed in three sections. The first section deals with the literature on problems faced by the farmers in producing various crops, the second section deals with review of studies dealing with the relationship of selected characteristics with problem faced. Finally last section of this chapter deals with the conceptual framework of the study.

2.1 Literatures on Problems Faced by the Farmers in Cultivating Various Crops

Biswas (1992) in his study identified farmers' problems in cotton cultivation. Non availability of quality seed in time, unfavorable and high cost of fertilizer and insecticides, lack of operating capitals, not getting fair weight and reasonable price according to grade, lack of technical knowledge, lack of storage facility, stealing from field, and late buying of raw cotton by Cotton Development Board were identified as major problems of cotton in Jessore District.

The most important problems identified by Kher and Halyal (1988) regarding cotton cultivation technology were an irregular and insufficient electricity supply, small size of holding for green manuring, inconvenience of intercropping due to weeds, high cost of farm fuel, scarce irrigation facilities. absence of location specific recommendations for ear thing up, lack of drought resistant varieties and lack of technical knowledge about plant protection and chemical fertilizers.

Chander and Sharma (1990) revealed that the main problems of potato cultivation were ignorance about improved cultivars and cultivation practices, ignorance about scientific method of sowing, lack of guidance of marketing potato, high cost of improved

cultivars, high cost of fertilizers, pesticides and irrigation, lack of enough space for storing potatoes scientifically.

Nahid (2005) revealed that the highest proportion (91 percent) of the growers had medium overall problem confrontation in cotton production, while 5 percent had high and 4 percent had low problem confrontation. The problems confronted by the cotton growers were not getting the price at a time after selling the cotton, selling problem of cotton, difficulty in getting purjifrom sugar mill, non-availability of fertilizer and pesticide in time, low supply of fertilizer and pesticide in time, delay of payment after selling the cotton, difficulty in getting loan, relay crops are not successful, lack of capital, lack of necessary advice from SAAO, lack of necessary advice from Agricultural Extension Officer, adverse climate, high price of fertilizer and pesticide, transport problem in carrying cotton, facing problem in tying cotton, insect and pest attack in cotton crop, late insupply of new varieties, lack of necessary advice and instructions from ACDO, irrigation problem, lack of skilled labor, lack of knowledge about diseases of cotton crop, lack of knowledge about rate of fertilizer and pesticide, absence of sufficient demonstration plots on cotton production, lack of training facility about cotton production and lack of leaflets, posters, etc. about cotton producion.

The most important problems identified by Kher and Halyal (1988) regarding cotton cultivation technology were an irregular and insufficient electricity supply, small size of holding for green manuring, inconvenience of intercropping due to weeds, high cost of farm fuel, scare irrigation facilities. absence of location specific recommendations for ear thing up, lack of drought resistant varieties and lack of technical knowledge about plant protection and chemical fertilizers.

Akandaet *al.* (1997) revealed that majority (80.95 percent) of the farmers had high problem confrontation compared to 16.19 percent having medium and 2.69 percent having low problem confrontation.

Hassan *et al.* (1998) observed that almost two-thirds (64.15 percent) of the respondents had medium problem confrontation compared to 18.82 percent high and 1.98 percent low problem confrontation.

Muttalebet *al.* (1998) revealed that among different constraints, high fertilizer cost, high seed cost, lack of quality seed, lack of awareness, lack of technological knowledge and low price of potato at harvest period were perceived as barriers for the adoption of potato technologies.

Alamet *al.* (2005) conducted a survey on jute crop in seven districts of Bangladesh and found that scarcity of quality seeds; high labor wage and low market price of fiber were the major constraints of jute production.

Ismail (2001) conducted a study on problems faced by the farm youths of hoar area of Mohangonjupazila. Study revealed six top problems in rank order and these were (i) no arrangement of loan for the farm youth for fishery cultivation, (ii) lack of government programmes in agriculture for the farm youth, (iii) absence of loan giving agencies for establishing farm in locality, (iv) general people face problem for fishery due to government leasing of Jalmohal, (v) lack of government programmes for establishing poultry farm, and (vi) lack of agricultural loan for the farm youth.

Pramanik (2001) made an extensive study on twenty-four problems of farm youth in Mymensingh villages relating to different problems in crop cultivation. Out of twenty-four problems the top four problems in rank order were: (i) NGO take high rate of interest against a loan. (ii) lack of agricultural machinery and tools, (iii) lack of cash and (iv) financial inability to arrange improved seeds, fertilizers and irrigation.

2.2 Studies on Relationship of Selected Characteristics of the Respondents with their Problem faced

2.2.1 Age and problem faced

Nahid (2005) conducted a study and found that there was no relationship between age of the cotton growers and their problem confrontation in cotton production.

Akanda (1993) found that there was no relationship between age of farmers and their problem faced in using quality rice (BR 11) seed.

Hasan (1995) found that there was no relationship between age of the block supervisors and their problem faced.

Rahman (1995) conducted a study and found negative relationship between age of the farmers and their problem faced.

Bhuyan (2002) in his study found a positive and significant relationship between age of the farmers and their constraint in banana cultivation. Similar findings were obtained by

Karim (1996) conducted a study and found that age had no significant relationship with problem faced.

Hossain (1985) in a study on landless laborers in Bhabakhali union of Mymensingh district found that there was no relationship between age of the landless laborers and their problem faced. Similar findings were obtained by Rahman (1995), All (1999), Rashid (1999), Parmanik (2001), Ahmed (2002), Hossain (2002) and Salam (2003) in their respective studies.

2.2.2 Education and problem faced

Nahid (2005) conducted a study and found that there was very high significant negative relationship between education of the cotton growers and their problem confrontation in cotton production.

Akanda (1993) in his study on problem confrontation of the farmers in respect of cultivating BR 11 rice found a significant negative relationship between education of the farmers and their problem faced.

Rahman (1995) found that the education of the farmers had significant negative effect on their faced constraint in cotton cultivation. The finding indicated that higher the education of the farmers, the lower was their faced constraint Mansur (1989), Islam (1987), and Kashem (1977) obtained similar findings.

Rahman (1995) in his study on problem faced by the pineapple growers found a significant negative relationship between education of the farmers and their problem faced.

Karim (1996) in his study found that education of the farmers had significant negative relationship with their problem faced.

Hague (2001) found a significant negative relationship between education and problem faced of the FFS farmers in practicing IPM.

Huque (2006) found that education of the farmers had highly significant negative relationship with their problem faced in using integrated plant nutrient management.

Basher (2006) found that education of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

Aziz (2006) found that education of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhircargachaupazilla under Jessore district.

The study of Ismail (2001) revealed that there was no significant relationship between education and problem faced of farm youth. Similar findings were obtained by Rashid (1975), Rahman (2006) and Raha (1989) in their respective studies.

2.2.3 Family size and problem faced

Nahid (2005) conducted a study and found that there was no significant relationship between family size of the cotton growers and their problem confrontation in cotton production.

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

Hague (1995) found that there was no significant relationship between family size and problem faced of the MohilaBittahenSamabayaSamittee. Similar findings were obtained by Rashid (1999), Bhuyan (2002), Hossain (2002) and Ahmed (2002) in their respective studies.

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

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

Haque (2006) found that family size of the farmers had no significant relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that family size of the farmers had no significant relationship with their constraints faced in Banana cultivation of SunargaonUpazilla under Narayangonjdistrict.

Basher (2006) found that family size of the farmers had no significant relationship with their problem confrontation in mashroom cultivation.

Aziz (2006) found that family size of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhikargachaupazilla under Jessore district.

2.2.4 Land possession and problem faced

Nahid (2005) conducted a study and found that there was a high significant negative relationship between total farm size of the cotton growers and their problem confrontation in cotton production.

Hossain (1985) found that barga farm size of the landless laboureres had a significant relationship with their problem confrontation. The problem confrontation was higher in barga farming than no barga farming category.

Islam (1987) in his research found that cattle strength of the Farmers had a significant negative relationship with their artificial insemination problem confrontation. Similarly, Ali and Anwar (1987) found that there was a negative relationship between cattle strength of the farmers and their cattle problem confrontation.

Raha (1989) found that there was no significant relationship between the farmers' area under irrigation and their irrigation problem confrontation. On the other hand, similar findings were obtained by Mansur (1989) and Bhuyan (2002) in their respective studies.

Rahman (1996) found that farm size of the respondents had a negative significant relationship with their problem confrontation in potato cultivation.

Karim (1996) conducted a study and found that farm size of the fanners had no significant relationship with their problem confrontation. Rashid (1975) obtained similar finding in his study.

Ali (1999) found that family farm size of the rural youth had no relationship with their anticipated problem confrontation in self-employment by undertaking selected agricultural

income-generating activities. Saha (1997), Rashid (1999), Hossain (2002), Bhuyan (2002), and Salam (2003) found similar findings in their respective studies.

Hague (2001) found that significant positive relationship between farm size and problem confrontation of the FFS farmers in practicing IPM.

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

Huque (2006) found that farm size of the farmers had no significant relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that farm size of the farmers had no significant relationship with their constraints faced in Banana cultivation of SunargaonUpazilla under Narayangonjdistrict.

Basher (2006) found that farm size of the farmers had significant negative relationship with their problem confrontation in mashroom cultivation.

Aziz (2006) found that farm size of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhikargachaupazilla under Jessore district.

2.2.5 Cotton cultivation area

Nahid (2005) conducted a study and found that there was a significant negative relationship between cotton farm size of the cotton growers and their problem confrontation in cotton production.

Basher (2006) found that cotton cultivation area of the farmers had significant negative relationship with their problem confrontation in cottoncultivation.

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

2.2.6 Annual family income and problem faced

Nahid (2005) conducted a study and found that there was a very high significant negative relationship between annual income of the cotton growers and their problem confrontation in cotton production.

Rashid (1975) in his study found that there was no relationship between annual family incomes the farmers and their agricultural problem confrontation. Though the relationship was not significant, relevant data indicated a considerable negative trend between income of the farmers and agricultural problem confrontation of the farmers.

Sarker (1983) in his study found that there was no relationship between the income of the farmers and their poultry problem confrontation.

Hossain (1985) in his study found a significant relationship between in come a problem confrontation of the landless laborers.

Rahman (1995) conducted a study and found negative significant relationship with their problem confrontation in cotton cultivation. Similar finding was obtained by Rahman (1995) and Islam (1987).

Karim (1996) found that the annual income of the farmers had significant negative relationship with their problem confrontation.

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

Haque (2006) found that annual family income of the farmers had no significant relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that annual family income of the farmers had very high negative significant relationship with their constraints faced in Banana cultivation of SunargaonUpazilla under Narayanganjdistrict. Aziz (2006) found the same.

Bashar (2006) found that annual family income high significant negative relationship with problem confrontation in mushroom cultivation.

2.2.7 Credit Availability and problem faced

No literature was found related to relationship between credit availability and problem faced by the famers.

2.2.8 Input availability and problem faced

Conley and Udry (2002) look at pineapple in Ghtma to see whether an individual farmer's fertilizer user respondents to changes in information aboutthe fertilizer productivity of this neighbors. They found that expected profitusing more (less) fertilizer than he did, indicating the importance of social learning. Both these models, however, assume that input price share fixed. In addition they ignore potential faced on the supply of inputs and other localized conditions. Although in some situations these assumptions may not be empirically important, in the context of the adoption of HY varieties, input prices and availability may be critical factors in this situation (Website).

2.2.9 Innovativeness and problem faced

Uddin (1995) reported that there was a highly significant relationship between Innovativeness of the farmers and their reception of information on planting method.

Islam (1987) found that Innovativeness of the farmers had positive and highly significant relation with the use of communication media.

Huque (2006) found that innovativeness of the farmers had highly significant negative relationship with their problem faced in using integrated plant nutrient management.

2.2.10 Extension media contact and problem faced

Nahid (2005) conducted a study and found that there was a very high significant negative relationship between extension media contact of the cotton growers and their problem confrontation in cotton production.

Akanda (1993) in his study conducted that extension contact of exerted significant negative influence on their faced constraints incultivation.

Hague (1995) found in his study that extension contact of the members of MohilaBittaheenSamabayaSamittee had no significant effect on their problem confrontation.

Rahman (1995) in his study conducted that extension contact of the farmers exerted significant negative influence on their faced constraints in cotton cultivation i.e. the higher the extension contact of the farmers the lower was their constraints facing.

The study of Ismail (2001) revealed that there was no significant relation between farm youths' extension contact and their agricultural problem confrontation. Similar findings were obtained by Raha (1989) and Hogue in their respective studies.

Huque (2006) found that extension media contact of the farmers had high significant negative relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that extension media contact of the farmers had no significant relationship with their constraints faced in Banana cultivation of SunargaonUpazilla under Narayangonj district.

Basher (2006) found that extension media contact of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

Aziz (2006) found that extension media contact of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhikargacha upazilla under Jessore district.

2.2.11 Training exposure and problem faced

Nahid (2005) conducted a study and found that there was no significant relationship between training exposure of the cotton growers and their problem confrontation in cotton production.

Saha (1997) found that training experience of the youth had no relationship the problem confrontation in relation to employment opportunity of youth. Similar findings were obtained by All in his study.

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

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

Basher (2006) found that training exposure of the farmers had high significant negative relationship with their problem confrontation in mushroom cultivation.

2.2.12 Cotton cultivation knowledge and problem faced

Nahid (2005) conducted a study and found that there was no significant relationship between cotton cultivation knowledge of the cotton growers and their problem confrontation in cotton production.

Saha (1983) studied on poultry problem confrontation and reported that the relationship between poultry knowledge and poultry problem confrontation was negative.

Raha (1989) reported that knowledge in irrigation of modern boro paddy of the farmers had no significant relationship with their irrigation problem confrontation.

Ralunan (1995) in his study found that the knowledge in cotton cultivation of the farmers had a significant negative effect on their faced constraints in cotton cultivation. Similar findings were obtained by Mansur (1989) and Sarker (1989) in their respective study.

Karim (1996) indicated in his study that agricultural knowledge of the farmers had significant negative relationship with their problem confrontation. Rahman (1996) also found similar findings in his study.

Haque (2006) found that knowledge of the farmers had significant negative relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that knowledge of the farmers had no significant relationship with their constraints faced in Banana cultivation of Sunargaon Upazilla under Narayanganj district.

Basher (2006) found that knowledge of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

Aziz (2006) found that knowledge of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhikargachaupazilla under Jessore district.

2.3 Conceptual framework of the study:

Cotton cultivators faced many problems. Characteristics of the farmers influence the problems faced by them. Considering these issues, the conceptual framework of the study is presented in figure 2.1.

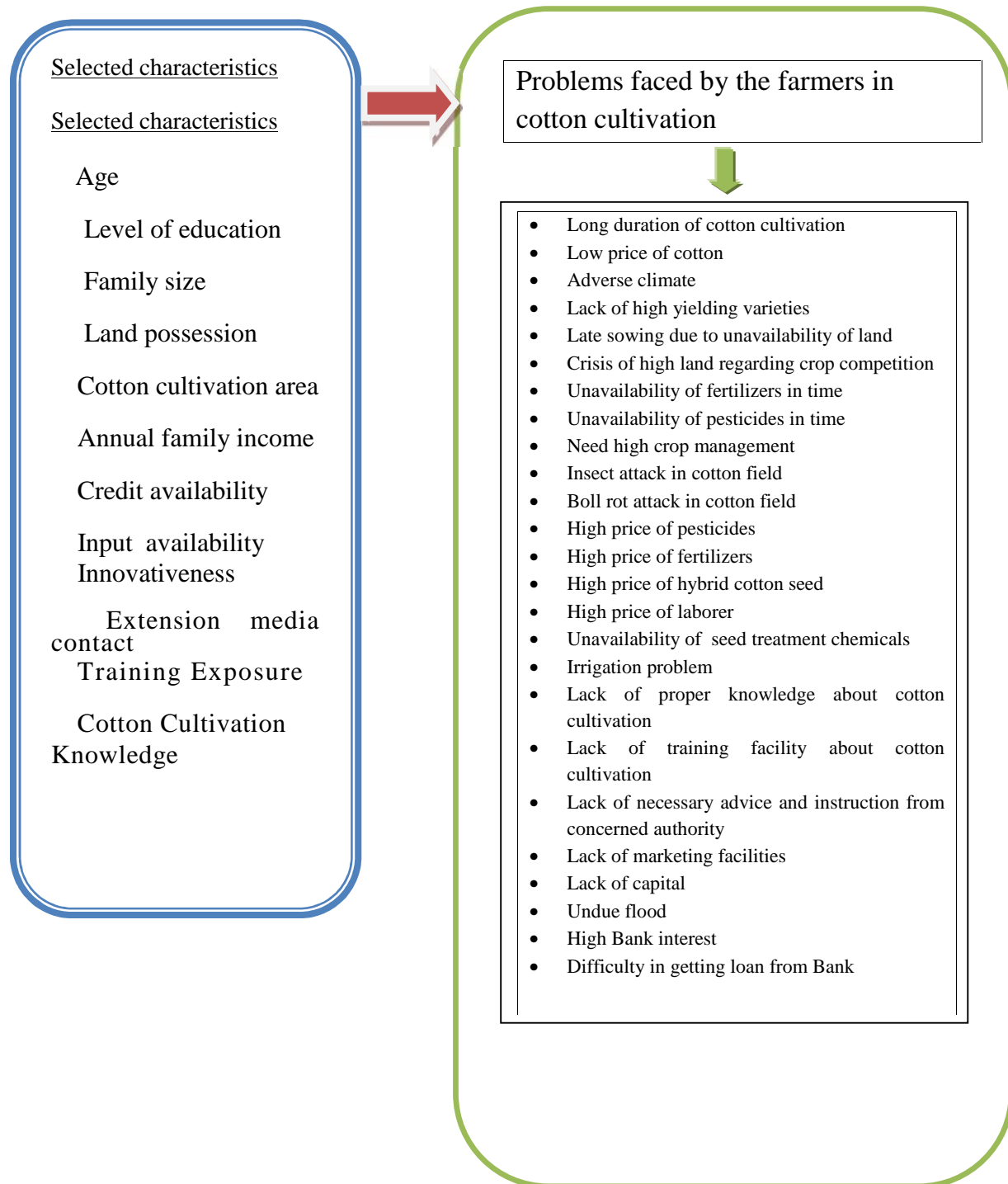


Figure 2.1: Conceptual framework of the study

CHAPTER 3

METHODOLOGY

The methods and procedures used in conducting research need very careful consideration. Methodology should be such that it enables the research to collect the valid information and to analyze the same property to arrive at correct decisions. The methods and procedures followed in conducting this study have been described in this Chapter.

3.1 Locale of the study

Three districts of Bangladesh, namely, Dhaka, Manikgong and Tangail were purposively selected as the locale of the study. From these districts five upazilas namely Dhamrai from Dhaka; Sadar and Saturia from Manikgong; and Nagarpur and Mirzapur from Tangail were purposively selected. Among these upazilas eight unions namely Chouhat and kulla from Dhamrai; Mukna and Pakutia from Nagarpur; Dighulia and Fukurhati from Saturia; Ghorpara from Manikgong Sadar; and Oarsi from Mirzapur were purposively selected. The figures 1 and 2 are showing the locale of the study.

3.2 Population and Sampling

Eight cotton producing unions were randomly selected for the study. Seven hundred and twenty five cotton cultivation farm family heads of the 8 unions constituted the population of this study. Sixteen percent of the farmers of each of the 08 unions were selected proportionately and randomly by using a Table of Random Numbers (Kerlinger, 1973). Thus, 116 farmers were selected to constitute the sample for this study. A reserve list of farmers were also prepared so that the farmers of this list could be used if any respondent of the sample was not available during the interview. Distribution of the farmers constituting the population, sample and those included in the reserve list has been shown in Table 3.1. for clarity of understanding.

Table 3.1 Distribution of the farmers constituting the population, sample and reserve list in selected unions.

SL. NO.	District	Upazillas	Unions	Number of farmers		Reserve list
				Population	Sample	
1	Dhaka	Dhamrai	Chouhat	103	17	2
			Kulla	67	11	1
2	Manikgong	ManikgongSadar	Ghorpara	63	10	1
3		Saturia	Dighulia	107	17	2
			Fukurhati	61	10	1
4	Tangail	Nagarpur	Mukna	101	16	2
			Pakutia	127	20	2
		Mirzapur	Oarsi	93	15	1
	Total			725	116	12



Figure 3: Map of Bangladesh showing selected districts under study area

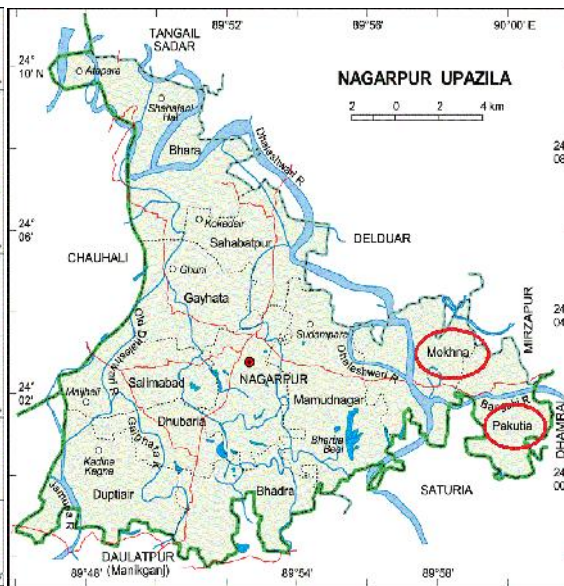
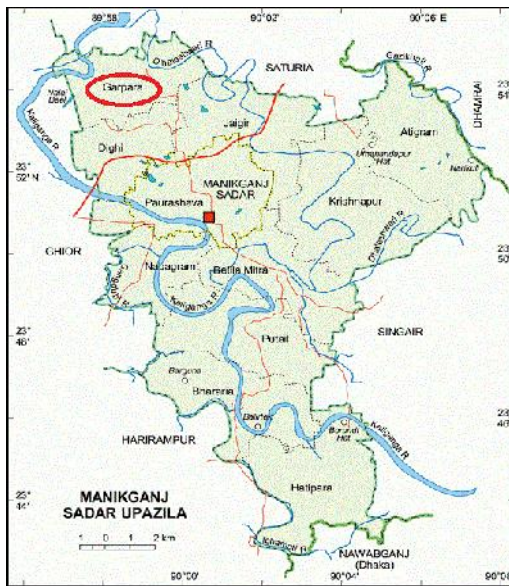




Figure 4: Map of selected Upazilla (Dhamrai, Saturia, ManikganjSadar, Nagarpur and Mirzapur) showing study area.

3.3 Variables of the Study and their Measurement

3.3.1 Measurement of problems faced by the farmers in cotton cultivation

Problems faced by the farmers in cotton cultivation was the main focus of the study. It was measured on the basis of the problems faced by the farmers in cotton cultivation. A scale was used for measuring problems faced by the farmers in cotton cultivation. The scale contained 25 probable problems, which the farmers might face in respect of cotton cultivation. Each respondent was asked to indicate the extent of difficulty faced by each of the problems by checking any one of the four alternative responses as "severe problem", "moderate problem", "little problem" and "no problem". Weights were assigned to these responses as 3, 2, 1 and 0 respectively. Weights for responses against all the 25 problem-items of a respondent were added together to obtain his problem faced score. Therefore, the problems faced score of the farmers could range from 0 to 75, where 0 indicated facing no problem and 75 indicated facing of very high problem.

To compare the severity among the problems, Problem Faced Index (PFI) was computed for each problem-item with help of the following formula:

$$PFI = P_s \times 3 + P_m \times 2 + P_l \times 1 + P_n \times 0$$

Where,

PFI = Problem Faced Index

P_s = Number of farmers facing "serious problem"

P_m = Number of farmers facing "moderate problem"

P_l = Number of farmers facing "little problem"

P_n = Number of farmers facing "no problem"

Thus, the PFI of the problems could range from 0-348, where 0 indicated facing of no problem and 348 indicated facing of serious problem. Rank order also made with the descending order of the PFI of the problem-items.

3.3.2 Measurement of selected characteristics of the cotton farmers

As mentioned earlier, twelve selected characteristics of the farmers constituted the independent variables of this study. Procedures followed for measuring these variables are described below.

3.3.2.1 Age

Age of a respondent was measured in complete years as reported by the respondent in response to question item no. 1 of the interview schedule (Appendix A). Example, if a man of 35 years old, he will get 35 scores.

3.3.2.2 Education

The education of a respondent was measured on the basis of his years of schooling (completed in educational institute), which was determined by his response to item no. 2 of the interview schedule (Appendix A). A score of one was given for each year of schooling. For example, if a respondent passed class V or equivalent, his education score was taken as 5. If a respondent passed the final examination of class IX, his score was taken as

9. A score of 0.5 was given to that respondent who could sign his name only. A score of zero (0) was assigned to the illiterate respondents.

3.3.2.3 Family size

The family size was measured by the total number of members in the family of a respondent including himself, wife, children and other dependents. The information was obtained by a respondent's response to item no. 3 of the interview schedule (Appendix A). The total number of family members was considered as the family size of a respondent.

3.3.2.4 Land possession

The total farm size of a respondent referred to the total area of land, on which his family carried out farming operations, the area being estimated in terms of full benefit to the farmers. A farm was considered to have full benefit from the cultivated area either owned by him or obtained on lease from others and half benefit from the area which was either cultivated by him on barga or given others for cultivation on barga basis. The land possession was measured for each respondent in terms of hectare by using the following formula:

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

Where,

LP = Land Possession

A_1 = Homestead area

A_2 = Own land under own cultivation

A_3 = Land taken from others on lease

A_4 = Land given to others on barga

A_5 = Land taken from others on barga

13.2.5 Annual family income

It referred to the total earnings in thousand taka by all the family members of a respondent from cotton, others crop, poultry, livestock, fisheries, business, service, daily labour, others during a year as contained in question no. 5 of the interview schedule (Appendix A).

3.3.2.6 Cotton cultivation area

The cotton cultivation area of a respondent was measured on the basis of the area on which his family carried out cotton cultivation operations. The area of cotton cultivation was expressed in hectare.

3.3.2.7 Credit availability

Credit availability of a respondent was measured by the following formula and was expressed in percentage.

$$\text{Credit availability} = \frac{\text{Credit requirement (Tk.)}}{\text{Credit requirement (Tk.)}} \times 100$$

Thus, credit availability of the respondents could range from 0-100, where 0 indicated no credit availability and 100 indicated the highest credit availability.

3.3.2.8 Input availability

Input availability refers to the availability of seven selected inputs for cotton cultivation, like modern varieties, fertilizers, insecticides, irrigation water and farm implements. Scores were assigned as 3, 2, 1 and 0 for regular, fair, seldom and not at all availability respectively. Thus, input availability score of the farmers could range from 0 to 21, where 0 indicated no input availability and 21 indicated highest input availability.

3.3.2.9 Innovativeness

Innovativeness was measured by the quickness of accepting innovations by an individual in relation to others. Scores for each of 9 selected innovations were assigned as follows:

'4' for use within 1 year of hearing

'3' for use within > 1 to 2 years of hearing

'2' for use within > 2 to 3 years of hearing

'1' for use after three years of hearing

'0' for don't use

Finally innovativeness score of a respondent was determined by the addition of scores for all the 09 selected innovations of that respondent. Thus, innovativeness score of the respondents could range from 0 to 36, where 0 indicated no innovativeness and 36 indicated highest innovativeness.

3.3.2.10 Extension media contact

Extension media contact was measured as one's extent of contact to different information sources. Each respondent was asked to indicate his/her nature of contact for each of 12 selected media with 05 alternative responses as regularly, often occasionally, rarely and not at all contacts and scores were assigned for those alternative responses as 4, 3, 2, 1 and 0 respectively. Logical frequencies were assigned for each of the alternative responses as mentioned in question no. 10 of interview schedule. Thus, extension media contact score of the farmers could range from 0 to 48, where 0 indicated no extension media contact and 48 indicated highest extension media contact.

3.3.2.11 Training exposure

Training exposure of a respondent was measured by the total number of days for which a respondent attended in different training programs on agriculture. If a respondent takes training for 5 days, s/he will get a score of 5.

3.3.2.12 Cotton cultivation knowledge

A scale consisting of 30 questions was used to determine the cotton cultivation knowledge score of the respondents. The questions were selected from different dimensions of cotton cultivation after thorough consultation with the relevant experts and concerned guide and review of relevant literatures as shown in Appendix A. The score allotted for each question was 2. A respondent could get 2 score against each question for correct response and 0 for wrong or no response. Partial score was assigned for partially correct answer. Thus, cotton cultivation knowledge score of the respondents could range from 0 to 60, where 0 indicated very low cotton cultivation knowledge and 60 indicated very high cotton cultivation knowledge.

3.4 Data Gathering instrument

In order to collect relevant data from the respondents an interview schedule was prepared. The interview schedule was pre-tested before final data collection for necessary correction, modification and adjustment. The interview schedule contained both open and closed form of questions. Simple and direct questions, and some scales were included in the schedule to obtain information for both independent and dependent variables. The questions were arranged systematically and presented clearly. The interview schedule in English rendering are attached in Appendix-A.

3.5 Collection of Data

The researcher himself collected data for this study personally through interviewing the respondents by using the interview schedule prepared earlier. Appropriate rapport was established with the respondents before collecting relevant information. However, if any respondent failed to understand any question, the researcher took necessary care to explain the matter. Data collection was started on 10 November, 2013 and completed on 31 December, 2013.

3.6 Data Processing and Analysis

The collected data were compiled, tabulated, and analyzed in accordance with the objectives of the study. The SPSS computer software was used to perform the data analysis. Descriptive statistics such as number, percent, mean, standard deviation, range and rank order were used to describe data. Pearson's Product Moment Correlation Co-efficient was used in order to explore the relationships between the concerned variables. Five percent (0.05) level of probability was used as the basis for rejection of any null hypothesis.

3.7 Hypothesis

The following null hypothesis was formulated to explore the relationships of each of the selected characteristics of the farmers with their problem faced in cotton cultivation.

"There is no relationship between each of the twelve selected characteristics of the farmers with their extent of problems faced in cotton cultivation".

CHAPTER 4

FINDINGS AND DISCUSSION

The purpose of this chapter is to describe the findings of the present study. The first section deals with the selected characteristics of the farmers, while the second section deals with the problem faced by the farmers in Cotton cultivation. Relationship between the selected characteristics of the farmers and their problem faced in Cotton cultivation has been discussed in the third section. The fourth section deals with the comparative severity among the problems faced by the farmers in Cotton cultivation.

4.1 Selected Characteristics of the Farmers

Twelve characteristics of the farmers were selected for this research. The characteristics include: age, education, family size, land possession, cotton cultivation area, annual family income, credit availability, input availability, innovativeness, extension media contact, training exposure and cotton cultivation knowledge.

4.1.1 Age

The observed age of the farmers ranged from 23 to 70 years with a mean of 46.67 years and standard deviation of 12.01. The respondents were classified into three age categories namely, young (upto 35 years), middle aged (36-50 years) and old (above 50 years) as shown in Table 4.1.

Table 4.1 Distribution of the farmers according to their age

Categories (years)	Cotton Farmers		Mean	Standard Deviation
	Number	Percent		
Young aged (up to 35)	24	20.7		

Middle aged (36-50)	51	44	46.67	12.01
Old aged (above 50)	41	35.3		
Total	116	100		

The largest proportion (44percent) of the farmers was middle aged, while 20.7 percent of them were young aged and 35.3 percent were old aged. Thus, about two third (64.7%) of the farmers belonged to young to middle aged categories.

4.1.2 Education

Education of the farmers ranged from 0 to above 14 years of schooling having an average of 5.4 years with a standard deviation of 4.67. On the basis of their education, the respondents were classified into five categories as shown in Table 4.2.

Table 4.2 Distribution of the farmers according to their education

Categories	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Illiterate (don't read and write)	1	0.9	5.4	4.67
Can sign only (0.5)	44	37.9		
Primary education (1-5 class)	18	15.5		
Secondary education(6-10 class)	39	33.6		
Above secondary level	14	12.1		
Total	116	100		

Data contained in Table 4.2 indicates the 37.9 percent of the farmers could sign their name only. It was found that 33.6 percent had secondary level of education,15.5 percent had primary level of education, and 12.1 percent had above secondary level of education.Only0.9 percent were illiterate (don't read and write).

4.1.3 Family size

Family size scores of the fanners ranged from 3 to 11 with an average of 5.43 and standard deviation of 1.81. According to family size, the respondents were classified into three categories as shown in Table 4.3.

Table 4.3 Distribution of the farmers according to their family size

Categories	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Small family (up to 4)	41	35.3	5.43	1.81
Medium family (5 - 7)	58	50.0		
Large family (above 7)	17	14.7		
Total	116	100		

Data contained in Table 4.3 indicates that half (50%) of the farmers had medium family while 14.7 percent of them had large family and only 35.3 percent of them had small family. Thus, about two third (64.7%) of the farmers had medium to large family.

4.1.4 Land possession

Land possession of the respondents varied from 0.07 to 2.26 hectare and the average being 0.76 hectare and standard deviation of 0.40. Depending on the land possession the respondents were classified into five categories according to DAE (1999) as appeared in table 4.4.

Table 4.4 Distribution of the farmers according to their land possession

Categories (hectare)	Cotton farmers		Mean	Standard deviation
	Number	Percent		
Marginal land possession (up to 0.2 ha)	3	2.6	0.76	0.40
Small land possession (0.2-1 ha)	85	73.3		

Medium land possession (1-3 ha)	28	24.1		
Total	116	100		

Data contained in table 4.4 indicates the 73.3 percent of the farmers had small land possession while 24.1 percent of them had medium land possession and only 2.6 percent of them were Marginal farmer.

4.1.5 Cotton cultivation area

Cotton cultivation area of the farmers varied from 0.08 to 1.43 hectare. The average Cotton cultivation area was 0.27 hectare with the standard deviation of 0.20. Based on Cotton cultivation area, the farmers are classified into three categories as shown in Table 4.5.

Table 4.5 Distribution of the farmers according to their Cotton cultivation

Categories (years)	Cotton Farmers		Mean	Standard Deviation
	Number	Percent		
Small (<Mean- 0.5sd or < 0.17)	43	37.1	0.27	0.20
Medium (Mean \pm 0.5sd or 0.17 to 0.37)	48	41.3		
Large (>Mean+0.5sd or >0.37)	25	21.6		
Total	116	100		

area

Data contained in Table 4.5 indicates that the largest proportion (41.3 percent) of farmers had small cotton cultivation area compared to 37.1 percent having small and 21.6 percent had large cotton cultivation area. It was again found that most (78.4 percent) of the farmers had small to medium cotton cultivation area.

4.1.6 Annual family income

The annual family income of the farmers ranged from Tk.46 thousand to Tk.517 thousand with an average of Tk. 141.93 thousand and standard deviation of 79.93 thousand. Based on the annual income, the farmers were divided into three categories as shown in Table 4.6. Farmers having income Tk. 220 thousand were considered as the high annual income as because above Tk. 220 thousand is the taxable income of Bangladesh.

Table 4.6 Distribution of the farmers according to their annual family income

Categories (years)	Cotton Farmers		Mean	Standard Deviation
	Number	Percent		
Low (up to 100 Thousand BDT)	45	38.8	141.93	79.93
Medium (101-220 Thousand BDT)	52	44.8		
High (above 220 Thousand BDT)	19	16.4		
Total	116	100		

From the Table 4.6 it was observed that the highest portion (44.8 percent) of the farmers had medium annual family income compared to 38.8 percent having low and only 16.4 percent had high annual family income.

4.1.7 Credit Availability

The observed credit availability scores of the farmers ranged from 0 to 100 percent, the mean being 40.98 and standard deviation of 25.04. Based on the credit availability scores, the farmers were classified into four categories as shown in Table 4.7.

Table 4.7 Distribution of the farmers according to their Credit Availability

Categories(percentage)	Cotton farmers		Mean	Standard deviation
	Number	Percent		

No Credit (0)	24	20.7	40.98	25.04
Low Credit (1-33)	14	12.1		
Medium Credit (34-66)	62	53.4		
High Credit (above 66)	16	13.8		
Total	116	100		

Data contained in Table 4.7 indicates that 53.4 percent of the farmers had medium credit availability, while 20.7percent of the farmers had no credit availability, 13.8 percent had high credit availability and 12.1 percent had low credit availability. It meant that overwhelming majority (86.2%) of the respondents had no to medium credit availability.

4.1.8 Input availability

The observed input availability scores of the farmers ranged from 8 to 20 against the possible range of 0 to 21, the average being 14.54 and standard deviation of 2.54. On the basis of the observed scores of the input availability scores, the farmers were classified into three categories as shown in Table 4.8.

Table 4.8 Distribution of the farmers according to their input availability

Categories(score)	Cotton farmers		Mean	Standard deviation
	Number	Percent		
Low (8 - 12)	25	21.6	14.54	2.54.
Medium (13- 16)	62	55.1		
High (17 - 20)	29	23.3		
Total	116	100		

Data contained in Table 4.8 indicated that 55.1 percent of the farmers had medium

input availability compared to 21.6 percent having low input availability and 23.3 percent of the farmers had high input availability.

4.1.9 Innovativeness

The observed innovativeness scores of the farmers ranged from 6 to 34 against the possible range of 0 to 36, the mean being 17.98 and standard deviation of 5.36. The farmers were classified into three categories according to their innovativeness as shown in Table 4.9.

Table 4.9 Distribution of the farmers according to Innovativeness

Categories (score)	Cotton farmers		Mean	Standard deviation
	Number	Percent		
Low (up to 12)	29	25	17.98	5.36
Medium (13-24)	74	63.8		
High (above 24)	13	11.2		
Total	116	100		

The Table 4.9 revealed that the highest proportion (63.8 percent) of the farmers had medium innovativeness compared to 25 percent low innovativeness and only 11.2 percent high innovativeness.

4.1.10 Extension media contact

The observed extension media contact scores of the farmers ranged from 6-29 against the possible range of 0 to 48, the mean being 14.42 and standard deviation of 5.27. According to their observed ranged of extension media contact scores, the farmers were classified into three categories as shown in Table 4.10.

Table 4.10 Distribution of the farmers according to extension media contact

Categories	Cotton farmers		Mean	Standard deviation
	Number	Percent		
Low (6-13)	62	53.4	14.42	5.27
Medium (14-21)	40	34.5		
High (22-29)	14	12.1		
Total	116	100		

Data presented in the Table 4.10 indicated that 53.4percent of the farmers had Low extension media contact compared to having 34.5 percent medium and 12.1percent high extension media contact. Findings again revealed that almost all (87.9 percent) of the farmers had low to medium extension contact.

4.1.11 Training exposure

The score of training exposure of the farmers ranged from 0 to 9 days, the mean being 2.85 and standard deviation of 2.21. Based on training exposure, the farmers were classified into three categories as shown in Table 4.11.

Table 4.11 Distribution of the farmers according to Training exposure

Categories (days)	Cotton farmers		Mean	Standard deviation
	Number	Percent		
No training (0)	26	22.4	2.85	2.21
Very low training (up to 3)	48	41.4		
Low training (4-9)	42	36.2		

Total	116	100		
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Data contained in Table 4.11 indicates that 41.4 percent of the farmers had very low training exposure; while 36.2 percent of the farmers low training exposure and 22.4 percent had no training exposure. Thus, about 78% of farmers had very low to lowtraining exposure.

4.1.12 Cotton cultivation knowledge

The computed Cotton cultivation knowledge scores of the farmers ranged from 18 to 48 against the possible range 0 to 60, the mean being 35.51 and standard deviation of 9.15. Based on their Cotton cultivation knowledge scores, the farmers were classified into three categories as shown in Table 4.12.

Table 4.12 Distribution of the farmers according to Cotton cultivation knowledge

Categories (score)	Cotton farmers		Mean	Standard deviation
	Number	Percent		
Low (<Mean- 1sd, i.e< 26.36)	26	22.4	35.51	9.15
Medium (Mean \pm 1sd, i.e 26.36 - 44.66)	74	63.8		
High (>Mean+1sd or >44.66)	16	13.8		
Total	116	100		

Data contained in Table 4.12 indicates that 63.8 percent of the farmers had medium cotton cultivation knowledge; while 22.4 percent of the farmers had low cotton cultivation knowledge and 13.8 percent of the farmers had high cotton cultivation knowledge.

4.2 Problems Faced by the Farmers in Cotton Cultivation

Problem means some difficulties that create obstacles to achieve specific goal. In this study, problems faced by the Farmers in Cotton Cultivation were the dependent variable. For going through cotton cultivation, farmers face a lot of significant challenging circumstances. To overcome these situations, reflective thinking is very essential. Problem faced, therefore, indicates the extent to which individual faced difficult situations about which something needs to be done. In this study, computed problems faced by the farmers in cotton cultivation scores ranged from 20 to 59 against the possible range 0 to 75, the

mean score was 37.76 and the standard deviation was 9.79. Based on the problems faced scores, the farmers were classified into three categories as shown in table 4.13.

Table 4.13 Distribution of the farmers according to problems faced in cotton cultivation

Categories (score)	Cotton farmers		Mean	Standard deviation
	Number	Percent		
Low (up to 25)	19	16.40	37.76	9.79
Medium (>25 to 50)	85	73.30		
High (>50)	12	10.30		
Total		100		

Data presented in the table shows that the majority (73.3%) of the farmers faced medium problem while 16.4% percent of the farmers faced low problem. Comparatively few farmers (10.30%) faced high problem in cotton cultivation. The findings again revealed that an overwhelming proportion (89.70 percent) of the farmers faced low to medium problem.

4.3 Comparative severity among the problems faced by the farmers in cotton cultivation

The observed Problem Faced Index of the problems ranged from 71 to 316 against the possible range of 0-348. Problem Faced Index (PFI) of the selected problems are shown in Table 4.15.

On the basis of PFI, it was observed that "Long duration of cotton cultivation" ranked first followed by "Low price of cotton", "Adverse climate", "Difficulty in getting loan from Bank", "High Bank interest", "Undue flood", "Crisis of high land regarding crop

competition", "Late sowing due to unavailability of land", "Insect attack in cotton field", "Boll rot attack in cotton field", "High price of hybrid cotton seed", "High price of pesticides" "Lack of high yielding varieties", "High price of labor", "Lack of marketing facilities", "Need high crop management", "Irrigation problem", "Lack of capital", "Unavailability of seed treatment chemicals", "Lack of proper knowledge about cotton cultivation", "Lack of training facility about cotton cultivation", "Unavailability of pesticides in time", "Unavailability of fertilizers in time", "High price of fertilizers" and "Lack of necessary advice and instruction from concerned authority".

Table 4.14 Problem Faced Index (PEI) with Rank Order

Problem	Extent of Problem				PFI	Rank Order
	Serious Problem	Moderate Problem	Little Problem	No Problem		
Long duration of cotton cultivation	87	26	03	0	316	1
Low price of cotton	84	29	03	0	313	2
Adverse climate	70	36	10	0	292	3
Difficulty in getting loan from Bank	39	59	15	03	250	4
High Bank interest	35	60	17	04	242	5
Undue flood	27	65	14	10	225	6
Crisis of high land regarding crop competition	32	49	29	06	223	7
Late sowing due to unavailability of land	31	41	32	12	207	8
Insect attack in cotton field	17	62	30	07	205	9
Boll rot attack in cotton field	18	49	42	07	194	10
High price of hybrid cotton	26	26	58	06	188	11

seed						
Lack of high yielding varieties	26	32	34	24	176	12
High price of laborer	12	37	62	05	172	13
High price of pesticides	11	38	57	10	166	14
Lack of marketing facilities	20	34	31	31	159	15
Need high crop management	26	38	30	22	148	16
Irrigation problem	15	22	54	25	143	17
Lack of capital	07	38	45	26	142	18
Unavailability of seed treatment chemicals	08	34	44	30	136	19
Lack of proper knowledge about cotton cultivation	22	13	31	50	123	20
Lack of training facility about cotton cultivation	15	16	40	45	117	21
Unavailability of pesticides in time	08	15	45	48	99	22
Unavailability of fertilizers in time	09	14	43	50	98	23
High price of fertilizers	07	11	51	47	94	24
Lack of necessary advice and instruction from concerned authority	10	06	29	71	71	25

4.4 Relationship between the Selected Characteristics of the Farmers and their Problems Faced in Cotton Cultivation

Coefficient of correlation was computed in order to explore the relationship between the selected characteristics of the farmers and their problems faced in cotton cultivation.

In order to determine the relationship of each of 12 selected characteristics of the farmers (age, education, family size, land possession, annual family income, cotton cultivation area, credit availability, input availability, organizational participation, extension media contact, innovativeness, training exposure, knowledge) with problems faced by the farmers in cotton cultivation. Pearson's Product Moment Correlation was used. Co-efficient of correlation (r) has been used to test the null hypothesis concerning the relationship between the concerned variables. Five percent level of significance was used as the basis for rejection of any null hypothesis.

The summary of the results of the Co-efficient of Correlation indicating the relationship between each of the selected characteristics of the farmers and their problems faced in cotton cultivation are shown in Table 4.14.

Table 4.15 Results of Co-efficient of Correlation Showing Relationship between each of the Selected Characteristics of the Farmers and their Problems Faced in Cotton Cultivation

	Selected Characteristics of the farmers	Observed correlation coefficient value (r) with 114 d.f	Table value	
			At 0.05 level	At 0.01 level
Problems Faced by the Farmers in Cotton Cultivation	Age	0.002 ^{NS}	0.182	0.237
	Education	-0.333 ^{**}		
	Family size	0.126 ^{NS}		
	Land possession	-0.438 ^{**}		
	Cotton cultivation area	-0.333 ^{**}		
	Annual family income	-0.134 ^{NS}		
	Credit availability	-0.003 ^{NS}		
	Input availability	-0.371 ^{**}		
	Innovativeness	-0.368 ^{**}		
	Extension media contact	-0.549 ^{**}		
	Training exposure	-0.572 ^{**}		
	Cotton cultivation knowledge	-0.833 ^{**}		

^{NS}Not Significant

* Significant at 0.05 level of probability

**Significant at 0.01 level of probability

4.4.1 Relationship between age of the farmers and their problems faced in cotton cultivation

Relationship between age of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between age of the farmers and their problems faced in cotton cultivation".

The computed value of the co-efficient of correlation (r) between the concerned variables was 0.002 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables on basis of the Co-efficient of correlation (r).

- The computed value of ' r ' (0.002) was smaller than the tabulated value ' r ' (0.182) with 114 degrees of freedom at 0.05 levels of probability.
- The concerned null hypothesis would not be rejected.

The findings demonstrate that age of the farmers had no significant relationship with their problems faced in cotton cultivation. This indicated that age of the farmer was not an important factor for their problems faced in cotton cultivation.

4.4.2 Relationship between education level of the farmers and their problems faced in cotton cultivation

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

The computed value of the co-efficient of correlation (r) between the concerned two variables were (-0.333) as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

Ñ The relationship showed a negative trend.

Ñ The computed value of 'r' (-0.333) was greater than the tabulated value of 'r' (0.237) with 114 degrees of freedom at 0.01 level of probability.

Ñ The null hypothesis was rejected.

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

The findings demonstrate that education level of the farmers had significant negative relationship with their problems faced in cotton cultivation.

This meant that the farmers having more education were likely to have less problems faced. It is quite logical that educated person can minimize any problems they faced.

4.4.3 Relationship between family size of the farmers and problems faced in cotton cultivation

Relationship between family size of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between family size of the farmers and their problems faced in cotton cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be 0.126 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (0.126) was smaller than the tabulated value 'r'(0.182) with 114 degrees of freedom at 0.05 levels of probability.
- The concerned null hypothesis was accepted.
- The relationship showed a negligible positive trend.

Thus, it was concluded that family size of the farmers had no significant relationship with their problems faced in cotton cultivation. Therefore, family size of the farmers was not an important factor for their problems faced in cotton cultivation.

4.4.4 Relationship between land possession of the farmers and their problems faced in cotton cultivation

Relationship between land possession of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between land possession of the farmers and their problems faced in cotton cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.438 as shown in Table 4.13. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 't' (-0.438) was greater than the tabulated value 't'_(0.237) with 114 degrees of freedom at 0.01 levels of probability.
- The concerned null hypothesis was rejected.
- A significant negative relationship was found to exist between the two concerned variables.

The findings demonstrate that land possession of the farmers had significant negative relationship with their problems faced in cotton cultivation.

This meant that the farmers having more land possession were likely to have less problems faced.

4.4.5 Relationship between cotton cultivation area of the farmers and problems faced in cotton cultivation

Relationship between cotton cultivation area of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship

between cotton cultivation area of the farmers and their problems faced in cotton cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.333 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.333) was greater than the tabulated value 'r' (0.237) with 98 degrees of freedom at 0.01 levels of probability.
- The concerned null hypothesis was rejected.
- A significant negative relationship was found to exist between the two concerned variables.

The findings demonstrate that cotton cultivation area of the farmers had significant negative relationship with their problems faced in cotton cultivation.

This meant that the farmers having more cotton cultivation area of the farmers were likely to have less problems faced.

4.4.6 Relationship between Annual family income of the farmers and their problems faced in cotton cultivation

Relationship between Annual family income of the farmers and their problems faced in cotton cultivation were determined by testing the null hypothesis: "There is no relationship between Annual family income of the farmers and their problems faced in cotton cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.134 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.134) was smaller than the tabulated value 'r' (0.182) with 114 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was accepted.
- A negligible negative relationship was found to exist between the two concerned variables.

The findings demonstrate that Annual family income of the farmers had no significant relationship with their problems faced in cotton cultivation. Therefore, Annual family income of the farmers was not an important factor for their problems faced in cotton cultivation.

4.4.7 Relationship between credit availability of the farmers and their problems faced in cotton cultivation

Relationship between credit availability of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between credit availability of the farmers and their problems faced in cotton cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.003 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

- The relationship showed a negative trend.
- The computed value of 'r' (-0.003) was smaller than the tabulated value 'r' (0.182) with 114 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was accepted.
- The relationship showed a negligible negative trend.

Thus, it was concluded that credit availability of the farmers had no significant relationship with their problems faced in cotton cultivation. Therefore, credit availability of the farmers was not an important factor for their problems faced in cotton cultivation.

4.4.8 Relationship between Input availability of the farmers and their problems faced in cotton cultivation

Relationship between Input availability of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between Input availability of the farmers and their problems faced in cotton cultivation".

The computed value of the co-efficient of correlation (r) between the concerned variables was found to be -0.371 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

- The relationship showed a negative trend.
- The computed value of 't.' (-0.371) was greater than the tabulated value 'r'(0.237) with 114 degrees of freedom at 0.01 level of probability.
- The null hypothesis was rejected.

The findings demonstrate that input availability of the farmers had high significant negative relationship with their problems faced in cotton cultivation. This meant that the farmers having more input availability face fewer problems in cotton cultivation. Lack of proper input in time is a serious problem. This was might be the reason for the negative relationship of the input availability of the farmers with their problems faced in cotton cultivation.

4.4.9 Relationship between innovativeness of the farmers and problems faced in cotton cultivation

Relationship between innovativeness of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between innovativeness of the farmers and their problems faced in cotton cultivation".

- The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.368 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.
- The relationship showed a negative trend.
- The computed value of 't' (-0.368) was greater than the tabulated value 't' (0.237) with 114 degrees of freedom at 0.05 levels of probability.
- The null hypothesis was rejected.

The findings demonstrate that innovativeness of the farmers had high significant negative relationship with their problems faced in cotton cultivation. This meant that the farmers having more innovativeness face fewer problems in cotton cultivation.

4.4.10 Relationship between Extension media contact of the farmers and problems faced in cotton cultivation

Relationship between extension media contact of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no

relationship between extension media contact of the farmers and their problems faced in cotton cultivation".

- The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.549 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.
- The relationship showed a negative trend.
- The computed value of 't.' (-0.549) was greater than the tabulated value 't' (0.237) with 114 degrees of freedom at 0.05 levels of probability.
- The null hypothesis was rejected.

The findings demonstrate that extension media contact of the farmers had highly significant negative relationship with their problems faced in cotton cultivation. This meant that the farmers having more extension media contact face fewer problems in cotton cultivation.

4.4.11 Relationship between training exposure of the farmers and problems faced in cotton cultivation

Relationship between training exposure of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between training exposure of the farmers and their problems faced in cotton cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.572 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

- The relationship showed a negative trend.

- The computed value of r (-0.572) was larger than the tabulated value r (0.237) with 98 degrees of freedom at 0.05 level of probability.
- The null hypothesis was rejected.

The findings reveal that training exposure of the farmers had highly significant negative relationship with their problems faced in cotton cultivation. This meant that the farmers having more training exposure face fewer problems in cotton cultivation. Training makes a man perfect to do his job properly.

Well trained person have the ability to cope with the problematic situation. This might be the reason for the above findings.

4.4.12 Relationship between cotton cultivation knowledge of the farmers and their problems faced in cotton cultivation

Relationship between cotton cultivation knowledge of the farmers and their problems faced in cotton cultivation was determined by testing the null hypothesis: "There is no relationship between cotton cultivation knowledge of the farmers and their problems faced in cotton cultivation.

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.833 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

- The relationship showed a negative trend.
- The computed value of r (-0.833) was larger than the tabulated value (0.237) with 114 degrees of freedom at 0.05 level of probability.
- The null hypothesis was rejected.

The findings reveal that cotton cultivation knowledge of the farmers had highly significant negative relationship with their problems faced in cotton cultivation. This meant that the farmers having more cotton cultivation knowledge face fewer

problems in cotton cultivation. By cotton cultivation knowledge, problems in cotton cultivation could be minimized. It was quite logical findings.

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

Findings in respect of the 12 selected characteristics of the cotton farmers summarized below:

Age: The highest proportion (44 percent) of the respondent cotton farmers was middle aged while 35.3 percent was old and 44 percent was young aged.

Education: The highest proportion (37.9 percent) of the respondent cotton farmers had can sign only, while 33.6 percent had secondary level, 15.5 percent had primary level, and 0.9 percent had illiterate.

Family size: The highest proportion (50 percent) of the cotton farmers had medium family size, while 14.7 percent had large family size and 35.3 percent had small family size.

Land possession:74.3 percent of the cotton farmers had small land possession, and while 24.1 percent had medium land possession.

Cotton cultivation area: Cotton cultivation area of the cotton farmers ranged from 0.08 to 1.43 hectare with a mean of 0.27 ha. 37.1percent of the cotton farmers had small cotton cultivation area, while 41.3percent had medium and 21.6 percent had large cotton cultivation area.

Annual family income: Annual family income of the Cotton farmers ranged from 46 to 517 thousand Tk. with the mean of 141.93 thousand Tk. The highest proportion (44.8 percent) of the Cotton farmers had medium annual family income compared with 38.8 percent and 16.4 percent having low and high annual family income respectively.

Credit availability: Credit availability scores of the cotton farmers ranged from 0 to 100 with the mean being 40.98. The majority (53.4 percent) of the cotton farmers had medium credit availability, 20.7 percent had no credit availability, 13.8 percent had high Credit availability and 12.1 percent had low credit availability.

Input availability: The observed input availability scores of the cotton farmers ranged from 8 to 20 with the mean of 14.54. The highest proportion (55.1 percent) of the cotton farmers had medium input availability as compared to 21.6 percent having low input availability.

Innovativeness: The observed innovativeness scores of the cotton farmers ranged from 6 to 34 with the mean of 17.98. The highest proportion (63.8 percent) of the cotton farmers had medium innovativeness as compared to 25 percent having low innovativeness and 11.2 percent having high innovativeness.

Extension media contact: The scores of the cotton farmers regarding extension media contact ranged from 6 to 29 with the mean of 14.42. More than half (61.2 percent) of the

cotton farmers had low extension media contact as compared to 34.5 percent medium and 12.1 percent high extension media contact.

Training exposure: Training exposure scores of the cotton farmers ranged from 0 to 9 with the mean being 2.85. The majority (41.4 percent) of the cotton farmers had very low training, 36.2 percent had low training and 22.4 percent had no training exposure.

Cotton cultivation knowledge: Cotton cultivation knowledge score of the cotton farmers ranged from 18 to 48 with the mean being 35.51. The highest proportion (63.8 percent) of the cotton farmers had medium cotton cultivation knowledge, while 22.4 percent had low and 13.8 percent had high cotton cultivation knowledge.

5.1.2 Problems faced by the farmers in cotton cultivation

The computed problems faced by the farmers in cotton cultivation scores ranged from 20-59 against the possible range of 0-75, the mean was 37.76. The majority (73.3 percent) of the cotton farmers faced medium problem while 16.4% of the farmers faced low problem. Comparatively few farmers (10.3 percent) faced high problem in cotton cultivation.

5.1.3 Relationship between selected characteristics of the farmers and their problems faced in cotton cultivation

Among 12 selected characteristics of the farmers, 8 namely, education, land possession, cotton cultivation area, input availability, innovativeness, extension media contact, training exposure and knowledge had significant negative relationship with their problems faced in cotton cultivation and the rest 4 characteristics namely, age, family size, annual family income, and credit availability had no significant relationship with their problems faced in cotton cultivation.

5.1.4 Comparative severity among the problems faced by the farmers in cotton cultivation

On the basis of PFI, it was observed that "Long duration of cotton cultivation" ranked first followed by "Low price of cotton", "Adverse climate", "Difficulty in getting loan from Bank", "High Bank interest", "Undue flood", "Crisis of high land regarding crop competition", "Late sowing due to unavailability of land", "Insect attack in cotton field", "Boll rot attack in cotton field", "High price of hybrid cotton seed", "High price of pesticides", "Lack of high yielding varieties", "High price of labor", "Lack of marketing facilities", "Need high crop management", "Irrigation problem", "Lack of capital", "Unavailability of seed treatment chemicals", "Lack of proper knowledge about cotton cultivation", "Lack of training facility about cotton cultivation", "Unavailability of pesticides in time", "Unavailability of fertilizers in time", "High price of fertilizers" and "Lack of necessary advice and instruction from concerned authority".

5.2 Conclusions

Conclusions were drawn on the basis of findings, logical interpretation and other relevant facts of the study:

1. An overwhelming majority (83.60%) of the cotton farmers faced medium to high problems in cotton cultivation. So, it may be concluded that immediate research and more involvement of government is necessary to mitigate the problems of cotton farmers.
2. The findings indicated that land possession and cotton cultivation area of the farmers had significant negative relationship with their problems faced in cotton cultivation. So, it may be concluded that the farmers having more land possession and cotton cultivation area had lower problems and vice-versa.
3. An overwhelming majority (88%) of the cotton farmers had low to medium input availability. Input availability of the farmers had significant negative relationship with

their problems faced in cotton cultivation. So, it may be concluded that cotton farmers having more input availability would face less problems and vice-versa.

4. An overwhelming proportion of the cotton farmers(88.8%) had low to medium scores of innovativeness. Thus, it was found a significant negative relationship between the innovativeness of the cotton farmers and their problems faced in cotton cultivation. So, it may be concluded that the farmers having more attraction, eagerness and attention toward a new technology of more yield and income faced lower problems.
5. Almost 83% of the cotton farmers had low to medium extension media contact. Findings showed that there was a significant negative relationship between the extension media contact and their problems faced in cotton cultivation. So, it may be concluded that if the cotton farmer come in more contact of extension provider, electronics and printed media, they will face less problems in cotton cultivation.
6. About two third of the farmers(63.8%) had no training to very low training. Again, an overwhelming portion of the cotton farmers(86.2%) had low to medium cotton cultivation knowledge. Findings expressed that both training exposure and cotton cultivation knowledge of the farmers had significant negative relationship with their problems faced in cotton cultivation. So, it may be concluded that the cotton farmers having lower training exposure and cotton cultivation knowledge face more problems in case of cotton cultivation and vice-versa.
7. On the basis of PFI, the cotton farmers faced various types of serious problems such as, "Long duration of cotton" ranked first followed by "Low price of cotton", "Adverse climate", "Difficulty in getting bank loan" and "High bank interest" in cotton cultivation. Therefore, It may be concluded that according to the severity of the problems, the first would be solved with the first priority and then the next.

5.3 Recommendations

Recommendations based on the findings and conclusions of the study have been presented below:

5.3.1 Recommendation for policy implication

1. The findings indicated that an overwhelming majority (83.60%) of the cotton farmers faced medium to high problem. So, it may be recommended that necessary steps should be taken by concerned authority to remove these problems so that they could make their cotton cultivation profitable by increasing cotton yield with less production cost.
2. The findings of the study indicated that education had significant negative relationship with problems faced by the farmers in cotton cultivation. Therefore, it may be recommended that the concerned authorities should take the special mass education program for the illiterate and low lettered farmers for solving their problems.
3. The findings of the study indicated that land possession had significant negative relationship with the problems faced by the farmers in cotton cultivation. It may be recommended that with all selected marginal farmers, more farmers having more cultivating areas also could be introduced newly with cotton cultivation by the extension workers of Cotton Development Board to reduce that problem.
4. The study revealed that cotton cultivation area had a negative significant relationship with the problems faced by the farmers in cotton cultivation. Therefore, it may be recommended that necessary measures should be taken by the concerned authority to increase cotton cultivation area of both marginal, medium and large farmers by making their cultivation more profitable.

5. The findings indicated that the input availability had a significant negative relationship with the problems faced by the farmers in cotton cultivation. So, it may be recommended that concerned authority should be more active and sincere to supply more inputs during cotton cultivation season so that they can overcome their problems.
6. The findings indicated that innovativeness had a negative significant relationship with the problems faced by the farmers in cotton cultivation. Therefore, it may be recommended that the extension provider of concerned authority should select those farmers with priority who have more attraction, eagerness and attention toward new technologies of more yield and income so that they can overcome their problems.
7. The findings had a significant relationship between the extension media contact and the problems faced by the farmers in cotton cultivation. So, it may be recommended that the extension workers of the concerned authority should increase the contact with farmers personally and motivate them to be connected with electronic and printed media that can help them to exchange related information which will reduce their problems.
8. The findings revealed that the training exposure had a significant negative relationship with the problems faced by the farmers in cotton cultivation. So, it may be recommended that the concerned authority should increase training facilities to develop skills of the cotton farmers technologically so that they can minimize their problems.
9. The findings indicated that cotton cultivation knowledge had significant negative relationship with the problems faced by the farmers in cotton cultivation. Thus, it may be recommended that the extension provider of concerned authority should take the necessary steps to increase their cotton cultivation knowledge through motivation, group discussion, group meeting, day training program, demonstration, etc to decrease their cultivation problems.

10. By analyzing PFI, it was found that "Long duration of cotton" was the main constraint to successful cultivation of cotton. Due to high cropping intensity almost everywhere in Bangladesh, farmers have a little interest to produce cotton for the possibility of having no economic benefit from this crop. It is, therefore, recommended that effective and necessary research activities should be undertaken by the scientist of the concerned authority to produce short duration cotton variety as soon as possible.

5.3.2 Recommendations for the future study

The following recommendations are made for the future study:

Recommendations for the future study

The present study covers some selective problems faced by the farmers in cotton cultivation. The following recommendations are made for undertaking studies covering more dimensions in related matters.

1. The study was conducted on the population of the cotton farmers of eight unions under five upazilaas of three districts. The findings of the study may vary by undertaking similar research in other cotton growing areas of the country. So similar studies might be undertaken in other parts of the country including cotton cultivating area to verify the findings of present study.
2. The study found out the relationship of the twelve selected characteristics of the cotton farmers with their problems faced in cotton cultivation. But the farmers' problem in the cotton cultivation might be affected by other different characteristics like personal, social, cultural, psychological and situational factors of the cotton farmers. It is, therefore, recommended that further study should be conducted for exploring the relationship of other characteristics of the cotton farmers with their problems faced in cotton cultivation.
3. This study included 25 problems of the farmers in cotton cultivation. But in addition the cotton farmers also faced other problems like social, economic, housing,

sanitation, nutrition, domestic etc. Therefore, it may be recommended that research should be undertaken in relation to other problems of the cotton farmers.

4. This research was done to find out degree to problems of cotton cultivation of the farmers. But there is a big scope of cotton cultivation in non- traditional areas of Bangladesh like saline, drought, heal and chorlands. Again intercropping, cotton based profitable cropping pattern etc are also the demand of time to grow more cotton. It is, therefore, recommended that further research should be undertaken related to other issues such as cotton cultivation in non-traditional regions of Bangladesh, intercropping of cotton, cotton based profitable cropping pattern, replacement of tobacco by cotton etc.

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Department of Agricultural Extension and Information System

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English Version of

AN INTERVIEW SCHEDULE FOR DATA COLLECTION FROM COTTON
FARMERS FOR THE RESEARCH ON

“PROBLEMS FACED BY THE FARMERS IN COTTON CULTIVATION”

Serial No.....

Name of Farmer.....

Village..... Union.....

... ..

Upazilla..... District.....

Please answer to the following questions

- 1. How old are you ?years**
- 2. What is the level of your education ?**
 - a. Do not know reading and writing.....
 - b. Do not know reading and writing but can sign only.....
 - c. Passed class.....
- 3. How much members are there in your family ?**
- 4. Please provide information about your land possession**

SL. No.	Type of Land	Land	
		Local unit	Hectare
A	Homestead area		

B	Own land under own cultivation		
C	Land taken from others on lease		
D	Land given to others as barga		
E	Land taken to others as barga		
	Total [A+B+C+ ½(D+E)]		

5. Please mention your Cotton cultivation area

Local Hectare.....
unit.....

6. Please mention the income of your family from different sources during last year

Sl.No.	Sources of Income	Total (Tk.)
1.	Cotton	
2.	Other crop	
3.	Poultry	
4.	Livestock	
5.	Fisheries	
6.	Business	
7.	Service	
8.	Daily labor	

9.	Others	
Total		

7. Did you need any credit for Cotton cultivation during sowing season ?

.....YesNo

If yes, name the source of the following.

Sources	Credit Required (a)	Credit received (b)	Credit availability ($\frac{b}{a} \times 100$)
Cotton Development Board			
Buyers			
Bank			
Money lender			
Relatives			
Total			

8. Please give opinion regarding availability of following inputs for cotton cultivation:

Sl. No.	Inputs	Extent availability

		Regular (3)	Fair (2)	Seldom (1)	Not at all (0)
1.	modern varieties of seed				
2.	fertilizers				
3.	pesticides				
4.	irrigation water				
5.	PGR				
6.	seed treatment chemicals.				
7.	labourer				

9. Please indicate the earliness of your use of the following innovations regarding Cotton Cultivation

Sl. No.	Name of the Innovations	Extent of the use of Innovations				
		Use within 1 year of hearing	Use within > 1 to 2 year of hearing	Use within > 2 to 3 year of hearing	Use after 3 year of hearing	Don't use
		4	3	2	1	0
1.	Hybrid cotton variety seed (DM-1, RUPALI-1)					
2.	Power Tiller					
3.	lime(for red soil)					

4.	green manure					
5.	Seed treatment by using chemicals					
6.	Foliar spray of chemical fertilizers					
7.	Biological pest control					
8.	Mechanical pest control					
9.	plant growth regulator					

10. Please mention your nature of contact with the following media.

Sl. No.	Media	Nature of extension contact				
		Regularly	Often	Occasionally	Rarely	Not at all
Personal contact						
1.	Experienced / model Cotton farmers	> 6 times/month	5-6 times/month	3-4 times/month	1-2 time/month	0 time/month
2.	Dealers input	>5 times/month	4-5 times/month	2-3 times/month	1 time/month	0 time/month
3.	Cotton Unit Officer/Sub-Assistant Agriculture Officer	>5times/month	4-5 times/month	2-3 times/month	1 time/month	0 time/month
4.	Upazilla Agriculture Officer/Cotton Development Officer/Agriculture Extension Officer	>5 times/year	4-5 times/year	2-3 times/year	1 time/year	0 time/year

Group contact						
5.	Group Discussion	More than 5 times/Year	4-5 times/Year	2-3 times/Year	1 time/Year	0 time/Year
6.	Group Meeting	More than 5 times/Year	4-5 times/Year	2-3 times/Year	1 time/Year	0 time/Year
7.	Results/Method demonstration	More than 5 times/Year	4-5 times/Year	2-3 times/Year ()	1 time/Year()	0 time/Year()
Mass contact						
8.	Radio	More than 3 times/Week	3times/Week	2 times/Week	1time/Week	0 time/Week
9.	Television	More than 3 times/Week	3 times/Week	2 times/Week	1 time/Week	0 time/Week
10.	Reading newspaper	More than 3 times/Week	3times/Week	2 times/Week	1time/Week	0 time/Week
11	Reading printed materials	More than 3 times/Week	3times/Week	2 times/Week	1time/Week	0 time/Week
12.	Farm Publications	More than 3 times/Year	3times/Year	2 times/Year	1time/Year	0 time/Year

11. Did you receive Cotton cultivation training ?

Yes ()

No ()

If yes, give the following information

Sl.No.	Topics of Training Course	Organizer	Training Year	Duration of Training (days)
1.	Fertilizer management			
2.	Modern cotton cultivation			
3.	Cotton based profitable cropping pattern			
4.	Effect of irrigation on cotton cultivation			
5.	IPM on Cotton			
6.	Others			
Total				

12. Please, answer the following questions ?

Sl. No.	Question	Marks	Marks obtained
1.	What is the benefit of early sowing of cotton	2	
2.	Is cotton deep rooted or shallow rooted plant	2	
3.	Mention dose of Zinc and Boron fertilizer on cotton field	2	
4.	How many times irrigation is needed for cotton cultivation	2	
5.	What is the benefit of hybrid variety cultivation	2	
6.	Name two hybrid variety of cotton crop	2	
7.	Name two diseases of cotton crop	2	
8.	Name two beneficiary insects of cotton crop	2	
9.	What is the cause of bollrot disease of Cotton crop	2	
10.	Why detopping is necessary for cotton cultivation	2	
11.	What will you do to save square, flower and boll shedding	2	
12.	What is the method of identifying American boll-worm and Spotted boll-worm	2	
13.	Why is mulching necessary for cotton cultivation	2	
14.	How molasses trap is applied for pest control	2	

15.	How light trap is applied for pest control	2	
16.	What time of day is the best for cotton picking	2	
17.	How does fog harm cotton	2	
18.	How is defoliation done for better yield of cotton	2	
19.	How does hopper burn happen in the cotton field	2	
20.	How do cotton plants take food from soil and sun light.	2	
21.	How does mulching keep good health of cotton plants	2	
22.	How does quality of cotton seeds become good and healthy	2	
23.	How do cotton seeds play vital role in GOT determination	2	
24.	What products do we get from seed cotton	2	
25.	Which fertilizer keeps cotton plant green	2	
26.	How does irrigation increase cotton yield	2	
27.	How does foliar spray increase cotton yield	2	
28.	How can you increase soil fertility	2	
29.	How to decrease the life cycle of cotton plant.	2	
30.	How to influence early boll bursting.	2	

13. Please mention the severities of the problems faced by you in cotton cultivation

Sl. No.	Problem	Extent of Problem			
		Serious Problem	Moderate Problem	Little Problem	No Problem
1.	Long duration of cotton cultivation				
2.	Low price of cotton				
3.	Adverse climate				
4.	Lack of high yielding varieties				
5.	Late sowing due to unavailability of land				
6.	Crisis of high land regarding crop competition				
7.	Unavailability of fertilizers in time				
8.	Unavailability of pesticides in time				
9.	Need high crop management				
10.	Insect attack in cotton field				
11.	Boll rot attack in cotton field				
12.	High price of pesticides				
13.	High price of fertilizers				
14.	High price of hybrid cotton seed				

15.	High price of laborer				
16.	Unavailability of seed treatment chemicals				
17.	Irrigation problem				
18.	Lack of proper knowledge about cotton cultivation				
19.	Lack of training facility about cotton cultivation				
20.	Lack of necessary advice and instruction from concerned authority				
21.	Lack of marketing facilities				
22.	Lack of capital				
23.	Undue flood				
24.	High Bank interest				
25.	Difficulty in getting loan from Bank				

	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	Y
X ₁	1												
X ₂	- 0.401 **												
X ₃	0.585 **	- 0.438* *											
X ₄	0.131	0.223*	0.081										
X ₅	0.023	0.236*	- 0.072	0.585 **									
X ₆	0.186 *	-0.026	0.216 *	0.467 **	0.262 **								
X ₇	- 0.120	-0.008	- 0.139	- 0.084	0.090	- 0.356 **							
X ₈	-0.09	0.014	- 0.155	0.121	0.014	0.164	- 0.019						
X ₉	- 0.116	0.147	- 0.026	0.066	- 0.024	0.262 **	- 0.035	0.483 **					
X ₁₀	- 0.097	0.313* *	- 0.076	0.266 **	0.082	0.149	0.137 **	- 0.270* *	0.482 **				
X ₁₁	0.091	0.038	0.080	0.262 **	0.046	0.291 **	- 0.030	- 0.063	0.294 **	0.442 **			

X ₁	-	0.295	-	0.306	0.289	0.240	0.003	0.392	0.466	0.426	0.636		
X ₂	0.077		0.116	**	**	**		**	**	**	**		
Y	0.020	-0.333	0.126	-	-	-	-	-	-	-	-	-	-
				0.438	0.333	0.134	0.003	0.331	0.368	0.549	0.572	0.836	
				**	**			**	**	**	**	**	

Correlation Matrix

*. Correlation is significant at the 0.05 level

**. Correlation is significant at the 0.01 level

X₁ = Age X₂ = education X₃ = Family size X₄ = land possession X₅ = Cotton area
X₆ = Income X₇ = Credit Availability

X₈ = Input Availability X₉ = Innovtiveness X₁₀ = Media Contact X₁₁ = Traning X₁₂ = Knowledge
Y = Problem