PROBLEMS FACED BY THE FARMERS IN SUGARCANE CULTIVATION

MD. RAFIQUL ISLAM

DEPARTMENT OF AGRICULTURAL EXTENSION & INFORMATION SYSTEM

SHER-E-BANGLA AGRICULTURAL UNIVERSITY, DHAKA

JUNE 2008

PROBLEMS FACED BY THE FARMERS IN SUGARCANE CULTIVATION

By

MD. RAFIQUL ISLAM

REGISTRATION NO. 01061

A Thesis

Submitted to the Faculty of Agriculture
Sher-e-Bangla Agricultural University, Dhaka
In partial fulfillment of the requirements
For the degree of

MASTER OF SCIENCE
IN
AGRICULTURAL EXTENSION AND INFORMATION SYSTEM
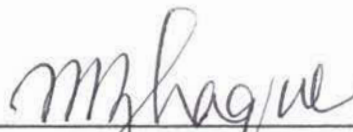
SEMESTER: JANUARY-JUNE, 2008

Approved by:

_____
(Dr. Md. Sekender Ali)

Supervisor

_____
(Prof. Mohammad Hossain Bhuiyan)

Co-Supervisor

_____
(Professor M. Zahidul Haque)
Chairman
Examination Committee

Ref:

Date: ....

CERTIFICATE

This is to certify that the thesis entitled *"PROBLEMS FACED BY THE FARMERS IN SUGARCANE 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 AGRICUTURAL EXTENSION AND INFORMATION SYSTEM*, embodies the result of a piece of bonafide research work carried out by *Md. Rafiqul Islam, Registration No. 01061*, under my supervision and guidance. No part of this thesis has been submitted to anywhere for any other degree or diploma.

I further certify that any help or sources of information as has been availed of during the course of this inquire have been duly acknowledged and the contents & style of the thesis have been approved and recommended for submission.

Dated:

Dhaka, Bangladesh

Dr. Md. Sekender Ali
Associate Professor
Department of Agricultural Extension
and Information System
Sher-e-Bangla Agricultural University

Dedicated To
My Beloved
Grandparents

ACKNOWLEDGEMENT

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABBREVIATIONS

ACDO	=	Assistant Cane Development Officer
BBS	=	Bangladesh Bureau of Statistics
BEC	=	Bangladesh Economic Census
SR	=	Bangladesh Rice
BSFIC	=	Bangladesh Sugar and Food Industries Corporation
BSRI	=	Bangladesh Sugarcane Research Institute
CDO	=	Cane Development Officer
et al.	=	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

PROBLEMS FACED BY THE FARMERS IN SUGRCANE CULTIVATION

ABSTRACT

The purpose of the study was to find out the extent of problems faced by the farmers in sugarcane cultivation and to explore the relationships of the farmers' selected characteristics with their problems faced in sugarcane cultivation. The study was conducted in 9 selected villages under Pabna Sadar Upazilla. Data were collected from a proportionately random sample of 100 sugarcane farmers by using an interview schedule during 10 September, 2007 to 11 November, 2007. The majority (68 percent) of the farmers faced moderate problem in sugarcane cultivation, while 8 percent low and 24 percent serious problem in sugarcane cultivation. Correlation analysis indicated that among 13 selected characteristics of the farmers, 6 namely, education, credit availability, input availability, extension media contact, training exposure and knowledge had significant negative relationship with their problem faced in sugarcane cultivation and the rest 7 characteristics namely, age, family size, land possession, annual family income, sugarcane cultivation area, organizational participation and innovativeness had no significant relationship with their problem faced in sugarcane cultivation. On the basis of Problem Faced Index, it was observed that "high price of fertilizer and pesticide", "Non-availability of fertilizer and pesticide in time" and "insect and pest attack of sugarcane" were the major three problems in sugarcane cultivation.

Chapter 1

Introduction

CHAPTER 1
INTRODUCTION

1.1 General Background

Bangladesh is basically a rural based agricultural country. Agriculture plays the vital role in capital formation. About 84.5 % of her total population lives in the rural areas and directly and indirectly depend on agriculture for their livelihood (BBS, 2006). Agriculture related sector contribute to as much as 20.87 % of Gross Domestic Product (GDP) of the country (BEC, 2008). The contribution of sugarcane crop to the national GDP was worked out at 0.67 % out of which highest GDP contribution was earned by gur sector (0.39 %) followed by sugar (0.15 %), chewing and juice (0.04 %), seed (0.03 %), cattle feed and fuel (0.03 %) and by product (0.03 %). On the other hand, GDP contribution of sugarcane economy was found highest in the gur production (57.35 %) followed by sugar (22.61 %), chewing and juice (6.25 %), seed (4.95 %), cattle feed and fuel (4.61 %) and by product (4.23 %) (Alam, 2005).

Sugarcane (*Saccharum officirum* Lin.) is a member of *Saccharum*, trible Androopogoneae, family graminee. Sugarcane species are usually highly polyploidy. Its cultivation is concentrated around the world between 35 North and 35 South of the latitude. It is a long durational vegetative propagated plant. In Bangladesh, it is generally cultivated in rainfall belt (below 1500 mm) of southwest and northwest part. It is the major sugar or gur producing crop of the country. The importance of sugarcane in the economy of Bangladesh can hardly be over emphasized. Besides sugarcane is the main source of sugar, but the production of sugarcane has not been able to keep place with the increased demand with the production growth. The area, production and yield per hectare in Bangladesh for the last five (5) years are shown in Table 1.1.

1

Table 1.1 Area and Production of Sugarcane from 2001- 2002 to 2005-2006 cropping seasons in Bangladesh

Year	Acreage '000' Acres	Production ('000' M. ton)
2001-2002	402	6502
2002-2003	410	6838
2003-2004	404	6484
2004-2005	388	6423
2005-2006	377	5511

Source: Bangladesh Bureau of Statistics (BBS, 2006)

Sugarcane is one of the most important cash-cum industrial crop in Bangladesh providing economically viable farming and employment opportunities to lots of people. Every year it occupies on an average 2.3 % of the total cultivable land (BBS, 2006). Sugarcane ranks second among cash crops and third among the major field crops in the country. Bangladesh is seventh among the sugarcane growing countries of the world covering 1.15 % of the country's total cultivable land (BBS, 2004).

Sugarcane of the country contributes significantly to the development of rural areas by providing the rural employment, improvement of the rural infrastructure and saving valuable foreign exchange, which are adding directly and indirectly to the national development. The government of Bangladesh is emphasizing the attainment of self-sufficiency in sugar and gur production by stabilizing sugarcane area and increasing yield (BSFIC, 1986). In Bangladesh, There are two well-defined zones of sugarcane cultivation, one is a mill zone and the other is non-mill zone. Sugar mills are situated mainly in the greater districts of Rajshahi, Pabna, Kushtia, Rangpur, Dinajpur, Bogra, Faridpur, Dhaka and Mymensingh.

Bangladesh suffers from chronic shortage of sweetener (sugar and gur) and raw material of sugar mills. But the climate condition in the sugarcane growing areas in Bangladesh support yield increase as high as 200-300 tones cane per hectare. So, there exists ample prospect and potentiality to increase the yield of sugarcane. In spite of this, average sugarcane yield in Bangladesh for the last five years is one of the lowest in the world (BBS, 2004).

Bangladesh Sugarcane Research Institute (BSRI) is engaged to conduct research to develop high production technologies to increase the yield of sugarcane. But, the farmers face a variety of problems for which sugarcane cultivation can not reach to a satisfactory level. So, there is a scope for increase in production of sugarcane, sugar, gur and it's by product though increasing yield per unit area which is not only to meet up country's growing demand of sugar and gur but also increase national GDP. Besides these, sugarcane plays an important role to develop infrastructure in rural areas, rural employment, income of the farm families, contribution to national exchequer, foreign exchange saving and value addition to the sugar, gur and as well as by product industries.

But the farmers faced several problems in sugarcane cultivation. A very few researchers tried to find out the problems in sugarcane cultivation. Therefore, the present researcher felt necessity to conduct the research entitled "Problems Faced by the Farmers in Sugarcane Cultivation".

1.2 Statement of the Problem

Problems faced by the farmers mean the difficulties that the farmers face in lack capital, high yielding varieties, adverse climate, insect and pest attack in sugarcane field, non-availability of fertilizers and pesticides, irrigation water, tying, failure of relay crops, skilled labor, getting purji, getting loan, necessary advice and instruction, training facilities of sugarcane. Sugarcane has an important consideration in agricultural field of Bangladesh. It is therefore, important to have adequate understanding on problems faced in sugarcane cultivation at farm level.

In some cases, the sugarcane farmers are not familiar with modern techniques of sugarcane cultivation. In the field area, it is possible to create some awareness among the farmers by the field level workers. The concerned farmers may face many problems in sugarcane cultivation. Therefore, a research study entitled "Problems Faced by the Farmers in Sugarcane Cultivation" was undertaken.

Considering the problems faced in sugarcane 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 sugarcane cultivation?
3. Is their any relationship between the farmers' problems faced in sugarcane cultivation and their selected characteristics?
4. What are the level severities of the different types of problems faced by the farmers in sugarcane cultivation?

1.3 Specific Objectives

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

1. To determine the extent of problems faced by the farmers in sugarcane cultivation.

2. To determine and describe some selected characteristics of the farmers. The Characteristics are:
    - Age
    - Education
    - Family size
    - Land possession

- Annual family income
- Sugarcane cultivation area
- Credit availability
- Input availability
- Organizational Participation
- Extension media contact
- Innovativeness
- Training Exposure
- Sugarcane Cultivation Knowledge

3. To explore the relationships between the selected characteristics of the sugarcane farmers and their extent of problem facing in sugarcane cultivation.

4. To compare the severity among the problems faced by the farmers in sugarcane cultivation.

1.4 Justification of the study

It is stated that sugarcane ranks third among major field crops in Bangladesh. Increasing sugarcane cultivation depends on raising the yield per unit area as no additional lands are planned as well as available for sugarcane cultivation now a day. The research effort, lead by Bangladesh Sugarcane Research Institute (BSRI), is devoted to producing more cane by increasing its yield. But different problems act adversely in the cultivation of sugarcane.

It is therefore, urgently necessary to devise ways and means to increase sugarcane cultivation by 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 extension programs in a better way.

1.5 Assumptions of the Study

"An assumption is the supposition that an apparent fact or principle is true in the light of the available evidence" (Goode, 1945). 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 sugarcane 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 Limitation in the Study

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

1. The study was confined to only nine selected sugarcane villages of Pabna Sadar Upazilla.
2. Characteristics of the farmers are many and varied but only thirteen were selected for investigation in this study as stated in the objectives.

3. Population for the present study was kept confined within the heads of the sugarcane cultivated farm families. Because they were the major decision makers regarding sugarcane cultivation.

4. For information about the study, the researcher depended on the data as furnished by the selected farmers during interview.

1.7 Definition of Terms

Certain terms used throughout the study are defined and interpreted below for clarity of understanding.

Age

Age of a farmer refers to the period of time in complete years from his birth to the time of interview. It was measured in term of actual years.

Education

Education refers to the extent of formal schooling of a farmer in schools, colleges or universities at the time of interview. Education was measured in term of actual years of successful schooling.

Family size

Family size of a farmer refers to the number of members including himself, his wife, children and other permanent dependents that live and eat together in a family unit.

Land possession

Land possession of a farmer refers to the total area, on which his family carries at 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 him on borga or given to others for cultivation on borga basis. It was expressed in hectare.

7

Annual family income

Annual family income refers to the total earnings of all the family members of a farmer from sugarcane, other corps, poultry, livestock, fisheries, business, service, daily labor and others accessible sources during a year.

Sugarcane cultivation area

Sugarcane cultivation area of a farmer refers to the area, on which his family carries out sugarcane cultivation operations and was expressed in hectare.

Credit availability

Credit availability of a respondent refers to the degree to which his credit requirement was fulfilled by the amount of credit actually received (whether it was received from institutional and non- institutional sources). It was expressed in percentage.

Input availability

Input availability refers to some essential elements like availability of modern varieties, availability of fertilizers, availability of insecticides, availability of irrigation water, and availability of farm implements etc. which are useful in sugarcane cultivation.

Organizational participation

Organizational participation of an individual refers to his participation in various organizations as ordinary member, executive committee member or executive officer within a specified period of time.

Extension media contact

Extension media contact refers to an individual's exposure to different information sources used for technology dissemination among the farmer.

Innovativeness

Innovativeness is the degree to within an individual adopts an innovation relatively earlier than other members in a social system (Rogers, 1995). This was comprehended by the quickness of accepting innovations by an individual in relation to others and was measured on the basis of time dimension.

Training exposure

It refers to the total number of days attended by the farmers in his life to the training courses on various agriculture related subject matter.

Sugarcane cultivation knowledge

Sugarcane cultivation knowledge of a farmer refers to the understanding of the farmer about the different aspects of sugarcane cultivation. It includes the basic understanding about the use of different inputs of sugarcane cultivation and practices.

Problem faced

Problem faced refers to a difficult situation about which something needs to be done. Problems faced in sugarcane cultivation refer to different problems as perceived by the farmers in sugarcane cultivation.

Chapter 2
Review of Literature

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

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

The most important problems identified by Kher and Halyal (1988) regarding sugarcane 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.

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.

Talukder *et al.* (1991) found that low market price of jute and high cost of cultivation was considered as the major problems in jute production. The high cost of cultivation was further increased by the shortage of agricultural labour in kharif season.

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.

Gumisiriza *el al.* (1994) showed several constraints of wheat production in Uganda. These were: traditional farming practices, unavailability or lack of improved cultivars, information and technology transfer, blasts (*Puccinia* spp.) and foliar diseases (*Septoria* and *Helinthosporiuin* spp.), and ineffective communication between research stations.

11

Akanda *et 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.

Muttaleb *et 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.

Alam *et al.* (2000) 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 Mohangonj upazila. 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 leashing 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 Selected Characteristics of the Farmers 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 sugarcane growers and their problem confrontation in sugarcane production.

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), Ali (1999), Rashid (1999), Parmanik (2001), Ahmed (2002), Hossain (2002) and Salam (2003) in their respective studies.

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. Shahidullah (1987) found similar finding.

Karim (1996) conducted a study and found that age had no significant relationship with 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 Rahman (1996) in his study.

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

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

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

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

Aziz (2006) found that age of the farmers had no significant relationship with their constraints faced in potato cultivation in Jhikargacha upazilla under Jessore district.

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 sugarcane growers and their problem confrontation in sugarcane 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.

Haque (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 mashroom cultivation.

Aziz (2006) found that education of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhikargacha upazilla 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 sugarcane growers and their problem confrontation in sugarcane production.

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

Haque (1995) found that there was no significant relationship between family size and problem faced of the Mohila Bittaheen Samabaya Samittee. 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.

Huque (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 Sunargaon Upazilla under Narayangonj distrct.

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 Jhikargacha upazilla 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 sugarcane growers and their problem confrontation in sugarcane production.

Ali (1978) in his study found that cattle strength of the farmers had a substantial negative relationship with their poultry problem confrontation. Similarly, Sarker (1983) found that poultry strength of the farmers had a substantial negative relationship with their poultry problem confrontation.

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

Akanda (1993) in his study found a negative significant effect on their problem confrontation.

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

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

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

Halim (2003) in his study conducted that the respondents' area under rice cultivation had a positive relationship with their constraints in adoption of crop diversification.

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 Sunargaon Upazilla under Narayangonj distrct.

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

18

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

2.2.5 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 sugarcane growers and their problem confrontation in sugarcane 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.

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

Huque (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 Sunargaon Upazilla under Narayangonj distrct. Aziz (2006) found the same.

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

2.2.6 Sugarcane cultivation area

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

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

2.2.7 Credit Availability and problem faced

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

2.2.8 Input Availability and problem faced

Conley and Udry (2002) look at pineapple in Ghana to see whether an individual farmer's fertilizer user respondents to changes in information about the fertilizer productivity of this neighbors. They found that expected profit

using more (less) fertilizer than he did, indicating the importance of social learning. Both these models, however, assume that input price sare 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).

2.2.8 Organizational participation and problem faced

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

Mansur (1989) in his study indicated that organizational participation of the farmers had a significant negative relationship with their problem confrontation.

Raha (1989) and Islam (1987) found that there was no significant relationship between the organizational participation of the farmers and their problem confrontation. Rashid (1975) found similar finding.

Rahinan (1995) concluded in his study that there was no relationship between the organizational participation of the farmers and their faced constraints in cotton cultivation.

Rahman (1995), Sarker (1993), Saha (1983) and Ali (1978) also found similar findings in their respective studies.

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

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

Rahman (2006) found that organizational participation of the farmers had significant negative relationship with their constraints faced in Banana cultivation of Sunargaon Upazilla under Narayangonj distrct.

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

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

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 sugarcane growers and their problem confrontation in sugarcane production.

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

Haque (1995) found in his study that extension contact of the members of Mohila Bittaheen Samabaya Samittee 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 Hoque 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 Sunargaon Upazilla under Narayangonj district.

Basher (2006) found that extension media contact of the farmers had significant negative relationship with their problem confrontation in mashroom 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 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 (1995) found that Innovativeness of the farmers had positive and highly significant relation with their use of communication media.

Khan (1996) concluded that there was no significant relationship between Innovativeness and use of information by resource poor farmers.

Nuruzzaman (2003) found that Innovativeness of the farmers had positive and significant relationship with their use of mass media.

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

2.2.12 Training exposure and problem faced

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

Ali (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 mashroom cultivation.

2.2.13 Sugarcane cultivation knowledge and problem faced

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

Rahman (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 kakrol growers had significant negative relationship with their problem confrontation. Rahman (1996) also found similar findings in his study.

Huque (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 Narayangonj district.

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

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

2.3 The Conceptual Framework of the Study

It is evident from the past studies that every occurrence or phenomenon is the outcome of a number of variables, which may or may not be interdependent or interrelated with each other. In other words, no single variable can contribute wholly to a phenomenon. Variables together are the cause and the phenomenon is the effect and thus, there is cause effect relationship everywhere in the universe.

The conceptual framework of Rosenberg and Hovland (1960) was kept in mind while framing the structural arrangement for the dependent and independent variables. This study was concerned with the problem faced by the farmers in sugarcane cultivation. Thus the problem faced on sugarcane cultivation activities was the main focus of the study and constituted the dependent variable. The characteristics of the farmers were considered as the independent variables. It is not possible to deal with all characteristics in a single study. It was therefore, necessary to limit the characteristics, which include age, education, family size, land possession, annual family income, sugarcane cultivation area, credit availability, input availability, organizational participation, extension media contact, innovativeness, training exposure and sugarcane cultivation knowledge.

Based on this discussion and review of literature the conceptual model of this study has been formulated and shown in the Figure 2.1
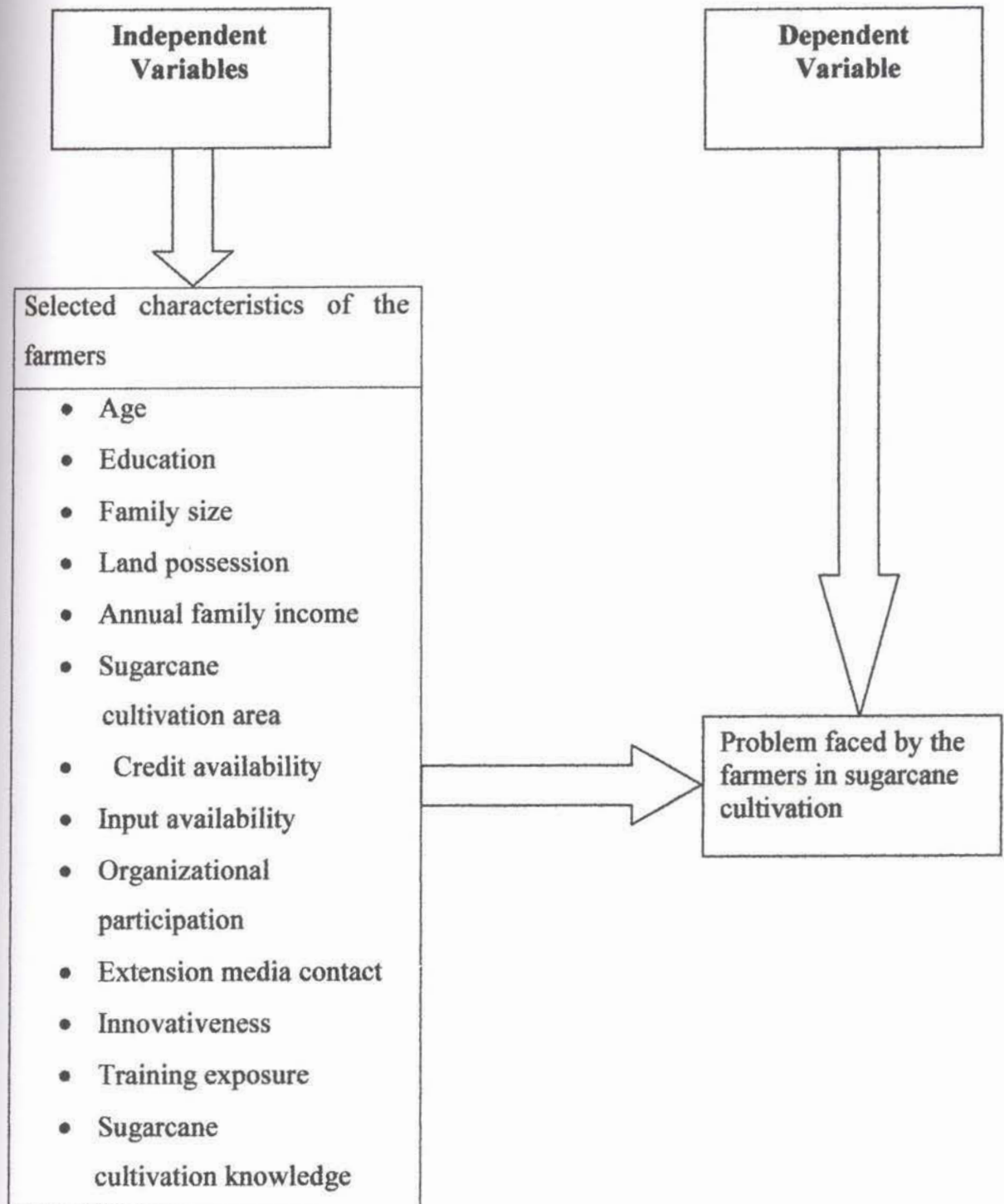
Figure 2.1. A Conceptual Framework of the Study

Chapter 3
Methodology

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 unions of Pabna Sadar Upazilla, namely, Bharara, Chartarapur and Sadullapur were purposively selected as the locale of the study. The figures 3.1 and 3.2 are showing Pabna Sadar Upazilla of Pabna district and the study area under Pabna Sadar Upazilla, respectively.

3.2 Population and Sampling

Nine sugarcane producing villages were randomly selected for the study. Nine hundred and ninety eight sugarcane cultivation farm family heads of the 9 villages constituted the population of this study. Ten percent of the farmers of each of the 9 villages were selected randomly by using a Table of Random Numbers (Kerlinger, 1973). One hundred farmers so selected constituted the sample for this study. A reserve list often 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.
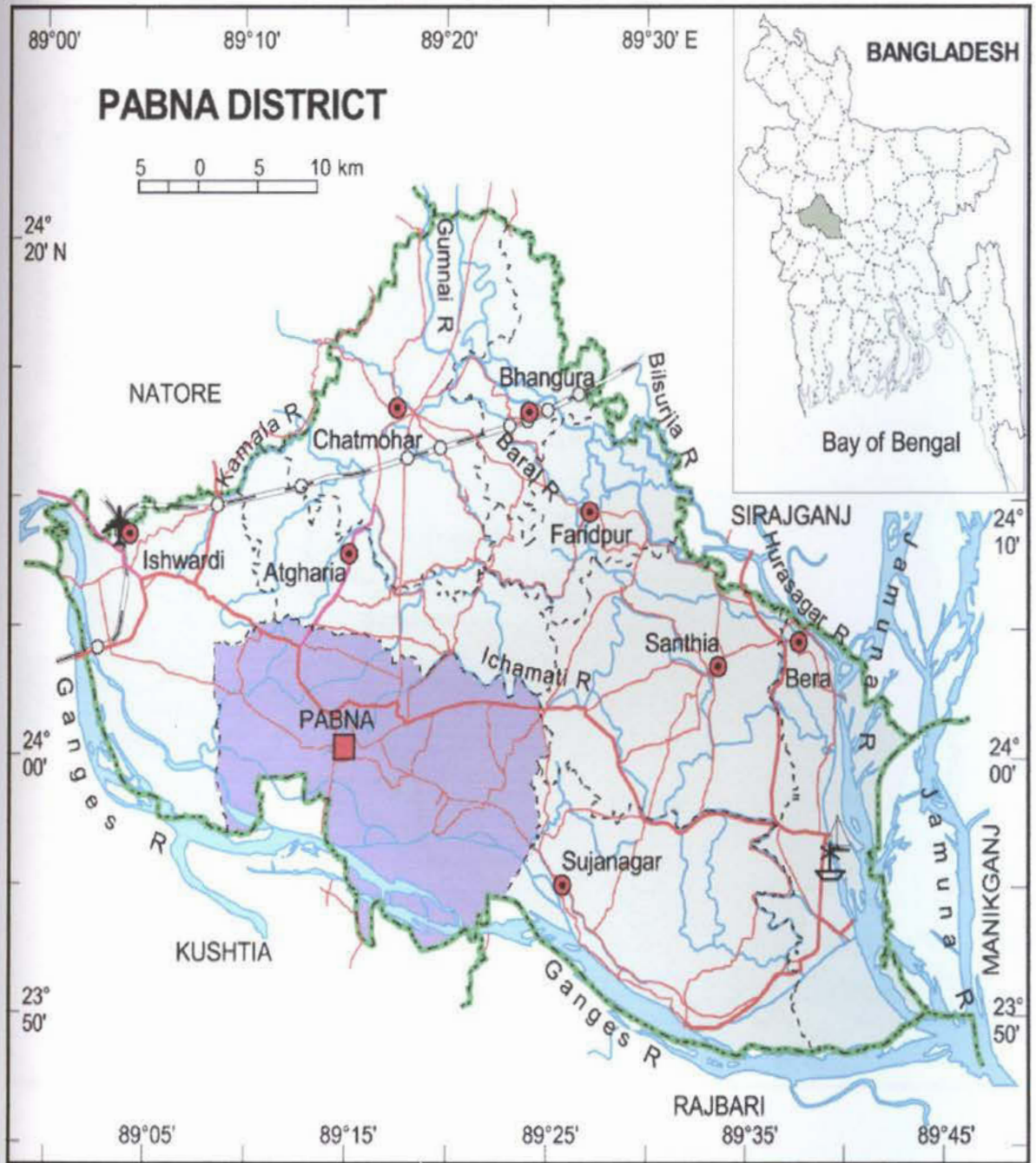
Fig. 3.1. Map of Pabna district showing Pabna Sadar Upazilla

Fig. 3.2. Map of Pabna Sadar Upazilla showing study area

Table 3.1 Distribution of the farmers constituting the population, sample and reserve list in selected villages under Pabna Sadar Upazilla

SL. No.	Unions	Villages	Number of the farmers		Reserve list
			Population	Sample	
1.	Bharara	Koladi	189	19	2
		Holudbaria	83	8	1
		Naldah	140	14	1
2.	Sadullapur	Dublia	60	6	1
		Sadullapur	66	7	1
		Shrikhol	130	13	1
3.	Chartarapur	Tarabaria	80	8	1
		Kachipara	90	9	1
		Tatipara	160	16	1
Total			998	100	10

3.3 Variables of the Study and their Measurement

3.3.1 Measurement of dependent variable

Problems faced by the farmers in sugarcane cultivation was the dependent variable of this study. It was measured on the basis of the problems faced by the farmers in sugarcane cultivation. A scale was used for measuring problems faced by the farmers in sugarcane cultivation. The scale contained fourteen probable problems, which the farmers might face in respect of sugarcane cultivation. Each respondent was asked to indicate the extent of difficulty caused by each of the problems by checking any one of the four responses "serious 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 fourteen 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 42, where 0 indicated facing of no problem and 42 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 = Percentage of farmers facing "serious problem"

P_m = Percentage of farmers facing "moderate problem"

P_l = Percentage of farmers facing "little problem"

P_n = Percentage of farmers facing "no problem"

Thus, the PFI of the problems could range from 0-300, where 0 indicated facing of no problem and 300 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 independent variables

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

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 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. If a respondent did not attend school but his level of education was equivalent to that of class three of the school, then his education score was taken as 3. 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 him on borga or given others for cultivation on borga basis. The land possession was measured for each respondent in terms of hectare by using the following formula:

$$LP = A_1 + A_2 + A_3 + 1/2\,(A_4 + A_5)$$

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 borga

A_5 = Land taken from others on borga

3.3.2.5 Annual family income

It referred to the total earnings in thousand taka by all the family members of a respondent from sugarcane, 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 Sugarcane cultivation area

The sugarcane cultivation area of a respondent was measured on the basis of the area on which his family carried out sugarcane cultivation operations. The area of sugarcane 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.

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

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

3.3.2.8 Input availability

Input availability refers to the availability of some selected inputs for sugarcane 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 15, where 0 indicated no input availability and 15 indicated highest input availability.

3.3.2.9 Organizational participation

Organizational participation of a respondent was measured on the basis of the nature and duration of his involvement in different 5 formal organizations in the study area as shown in item no. 9 of the interview schedule (Appendix A). Following the scoring system score was assigned for computing organizational participation score in an organization:

'0' score for no involvement

'1' score for 1year as Ordinary member

'2' score for 1 year of Executive member

'3' score for 1 year of Executive Officer

The scores so obtained in all the concerned organizations were added together to get the organizational participation score of a respondent. As there were five organizations in the study area, the organizational participation scores of the respondents could range from 0 to 75, where 0 indicated no organizational participation and 75 indicated very high organizational participation.

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 nature of contact for each of 10 selected media with five alternative responses as regularly, often, occasionally, rarely and not at all contact 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 40, where 0 indicated no extension media contact and 40 indicated highest extension media contact.

3.3.2.11 Innovativeness

Innovativeness was measured by the quickness of accepting innovations by an individual in relation to others. Scores for each of 10 selected innovations were assigned as follows:

'4' for use within one year of hearing

'3' for use after one year of hearing

'2' for use after two 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 10 selected innovations of that respondent. Thus, innovativeness score of the respondents could range from 0 to 40, where 0 indicated no innovativeness and 40 indicated highest innovativeness.

3.3.2.12 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, his will get 5 scores.

3.3.2.13 Sugarcane cultivation knowledge

A scale consisting of 25 questions was used to determine the sugarcane cultivation knowledge score of the respondents. The questions were selected from different dimensions of sugarcane cultivation after thorough consultation with the relevant experts 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 and partial score was assigned for partially correct answer. Thus, sugarcane cultivation knowledge score of the respondents could range from 0 to 50, where 0 indicated very low sugarcane cultivation knowledge and 50 indicated very high sugarcane cultivation knowledge.

3.4 Hypothesis

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

"There is no relationship between each of the thirteen selected characteristics of the farmers and their extent of problems faced in sugarcane cultivation".

3.5 Data Gathering Instrument

In order to collect relevant data from the respondents an interview schedule was prepared in Bengali. 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 Bengali and its English rendering are attached in Appendix-A.

3.6 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 September, 2007 and completed on 11 November, 2007.

3.7 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 date 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.

Chapter 4

Findings and Discussion

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 sugarcane cultivation. Relationship between the selected characteristics of the farmers and their problem faced in sugarcane cultivation has been discussed in the third section. The fourth section deals with the comparative severity among the problems faced by the farmers in sugarcane cultivation.

.4.1 Selected Characteristics of the Farmers

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

4.1.1 Age

The observed age of the farmers ranged from 21 to 75 years with a mean of 41.44 years and standard deviation of 12.00. 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)	Sugarcane Farmers		Mean	Standard Deviation
	Number	Percent		
Young aged (up to 35)	42	42		
Middle aged (36-50)	38	38	41.44	12.00
Old aged (above 50)	20	20		
Total	**100**	**100**		

The largest proportion (42 percent) of the farmers were young aged, while 20 percent of them were old and 38 percent were middle aged. Thus, an over-whelming majority (80 percent) of the farmers belonged to young to middle aged categories.

4.1.2 Education

Education of the farmers ranged from 0 to 16 years of schooling having an average of 4.11 years with a standard deviation of 4.96. On the basis of their education, the respondents were classified into four categories as shown in Table 4.2.

Table 4.2 Distribution of the farmers according to their education

Categories	Respondent farmers		Mean	Standard Deviation
(schooling years)	Number	Percent		
Illiterate (Don't read and write)	34	34		
Can sign only (0.5)	24	24		
Primary education (1-5 class)	6	6	4011	4.96
Secondary education (6-10 class)	25	25		
Above secondary level	11	11		
Total	**100**	**100**		

Data contained in Table 4.3 indicates that 24 percent of the farmers could sign their name only, while 34 percent were illiterate don't read and write. It was found that 6 percent had primary level of education, 25 percent had secondary level of education and 11 percent had above secondary level of education. Thus, about three-fifth (58 percent) of the farmers were illiterate or could sign their name only.

4.1.3 Family size

Family size scores of the farmers ranged from 3 to 18 with an average of 7.06 and standard deviation of 3.15. According to family size, the respondents were classified into the three categories as shown in Table 4.3.

Table 4.3 Distribution of the farmers according to their family size

Categories (names)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Small family (up to 4)	38	38		
Medium family (5-7)	39	39	7.06	3.16
Large family (above 7)	23	23		
Total	**100**	**100**		

Data presented in Table 4.4 show that the highest proportion (39 percent) of the farmers had medium family size, while 38 percent of them had small families and 23 percent had large families. Thus, more than three-fifth (62 percent) of the farmers had medium to large family.

4.1.4 Land possession

Land possession of the farmers varied from 0.40 to 5.61 hectare. The average land possession was 1.55 hectare with a standard deviation of 0.89. Based on land possession, the farmers were classified into three categories as shown in Table 4.4.

Table 4.4 Distribution of the farmers according to their land possession

Categories (hectare)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Small (0-1 ha)	32	32		
Medium (1.01-3 ha)	62	62	1.55	0.89
Large (above 3 ha)	6	6		
Total	**100**	**100**		

Data contained in Table 4.5 indicate that the highest proportion (62 percent) of the farmers had medium land possession, while 32 percent had small land possession and 6 percent had large land possession. Thus, almost all (94 percent) the farmers had small to medium land possession.

4.1.5 Annual family income

The annual family income of the farmers ranged from Tk.32 thousand to Tk.645 thousand with an average of Tk.158.04 thousand and standard deviation 100.52 thousand. Based on the annual income, the farmers were divided into three categories as shown in Table 4.5.

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

Categories ('000'taka)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Low (up to 100)	34	34		
Medium (101-300)	57	57	158.04	100.52
Large (above 300)	9	9		
Total	**100**	**100**		

From the Table 4.6, it was observed that the highest portion (57 percent) of the farmers had medium annual family income compared to 34 percent having low and only 9 percent, high annual family income.

4.1.6 Sugarcane cultivation area

Sugarcane cultivation area of the farmers varied from 0.07 to 2.00 hectare. The average sugarcane cultivation area was 0.33 hectare with the standard deviation of 0.29. Based on sugarcane cultivation area, the farmers are classified into three categories as shown in Table 4.6.

Table 4.6 Distribution of the farmers according to their sugarcane cultivation area

Categories (hectare)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Small (up to-0.33 ha.)	69	69		
Medium (0.34-1 ha.)	27	27	0.33	0.29
Large (above 1.00 ha.)	4	4		
Total	**100**	**100**		

Data contained in Table 4.7 indicates that the largest proportion (69 percent) of farmers had small sugarcane cultivation area compared to 4 percent having large and 27 percent medium sugarcane cultivation area. It was again found that almost all (96 percent) the farmers had small to medium sugarcane cultivation area.

4.1.7 Credit Availability

The observed credit availability scores of the farmers ranged from 0 to 100 percent, the mean being 62.05 and standard deviation of 40.00. 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)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
No Credit (0)	21	21		
Low Credit (1-33)	11	11		
Medium Credit (33-66)	20	20	62.05	40.00
High Credit (above 66)	48	48		
Total	**100**	**100**		

Data contained in Table 4.8 indicates that 21 percent of the farmers had no credit availability, while 11 percent of the farmers had low credit availability, 20 percent had medium credit availability and 48 percent had high credit availability. That means more than half (52 %) of the farmers had no to medium credit availability.

4.1.8 Input availability

The observed input availability scores of the farmers ranged from 8 to 13 against the possible range of 0 to 15, the average being 9.95 and standard deviation of 1.19. On the basis of the input availability scores, the farmers were classified into two categories as shown in Table 4.8.

Table 4.8 Distribution of the farmers according to their input availability

Categories (scores)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Medium (8-10)	74	74	9.95	1.19
High (11-13)	26	26		
Total	**100**	**100**		

Data contained in Table 4.9 indicated that about three-fourth (74 percent) of the farmers had medium input availability compared to 26 percent having high input availability.

4.1.9 Organizational participation

The observed organizational participation scores of the farmers ranged from 0 to 30 against the possible range of 0 to 75, with the mean of 5.59 and standard deviation of 6.65. Based on their organizational participation scores, the farmers were divided into three categories as shown in Table 4.9.

Table 4.9 Distribution of the farmers according to their organizational participation

Categories (scores)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
No participation (0)	37	37	5.59	6.65
Low participation (1-15)	56	56		
Medium participation (16-30)	7	7		
Total	**100**	**100**		

Data revealed in Table 4.10 indicates that the largest proportion (56 percent) of the farmers had low organizational participation; compared to 37 percent had no organizational participation and 7 percent medium organizational participation.

4.1.10 Extension media contact

The observed extension media contact scores of the farmers ranged from 8-28 against the possible range of 0 to 40, the mean being 14.92 and standard deviation of 5.59. The distribution of the farmers according to their 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 (scores)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Low (up to 13)	50	50		
Medium (14-26)	46	46	14.92	5.59
High (above 26)	4	4		
Total	100	100		

Data presented in the Table 4.11 indicated that half (50 percent) of the farmers had low extension media contact compared to having 4 percent high and 46 percent medium extension media contact. Findings again revealed that almost all (94 percent) the farmers had low to medium extension contact.

4.1.11 Innovativeness

The observed innovativeness scores of the farmers ranged from 11 to 34 against the possible range of 0 to 40, the mean being 23.13 and standard deviation of 4.27. The distribution of the farmers innovativeness scores, the farmers were classified into three categories as shown in Table 4.11.

Table 4.11 Distribution of the farmers according to their innovativeness

Categories (scores)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Low (up to 20)	26	26		
Medium (21-30)	69	69	23.13	4.27
High (above 30)	5	5		
Total	**100**	**100**		

The Table 4.12 revealed that the highest proportion (69 percent) of the farmers had medium innovativeness compared to 26 percent low innovativeness and only 5 percent high innovativeness.

4.1.12 Training exposure

The score of training exposure of the farmers ranged from 0 to 100 days, the mean being 10.51 and standard deviation of 26.08. Based on training exposure, the farmers were classified into three categories as shown in Table 4.12.

Table 4.12 Distribution of the farmers according to their training exposure

Categories (days)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
No training (0)	72	72		
Low training (1-30)	17	17	10.51	26.08
Medium training (31-100)	11	11		
Total	**100**	**100**		

Data contained in Table 4.13 indicates that majority (72 percent) of the farmers had no training exposure; while 17 percent of the farmers had low training exposure and 11 percent had medium training exposure. It means that an overwhelming majority (89 percent) of the farmers had no or low training exposure.

4.1.13 Sugarcane cultivation knowledge

The computed sugarcane cultivation knowledge scores of the farmers ranged from 16 to 50 against the possible range 0 to 50, the mean being 35.30 and standard deviation of 6.99. Based on their sugarcane cultivation knowledge scores, the farmers were classified into three categories as shown in Table 4.13.

Table 4.13 Distribution of the farmers according to sugarcane cultivation knowledge

Categories (scores)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Low (up to 25)	6	6		
Medium (26-38)	57	57	35.30	6.99
High (above 38)	37	37		
Total	**100**	**100**		

Data presented in the Table 4.14 indicates that majority (57 percent) of the farmers had medium sugarcane cultivation knowledge as compared to 37 percent high and 6 percent low sugarcane cultivation knowledge. This means that about three-third (63 percent) of the farmers had low to medium sugarcane cultivation knowledge.

4.2 Problems Faced by the Farmers in Sugarcane Cultivation

Problems Faced by the farmers in Sugarcane Cultivation was the dependent variable of the study. Problem defined by Goode (1945) is, any significant perplexing and challenging situation, real and artificial, the solution of which requires reflective "thinking". Problem faced, therefore, refers to the extent to which individual faces difficult situations about which something needs to be done.

In this study, the computed Problems Faced by the farmers in Sugarcane Cultivation scores ranged from 11 to 24 against the possible 0 to 42. The mean score was 19.94 and standard deviation was 1.97. Based on the problems faced scores, the farmers were classified into three categories as shown in Table 4.14.

Table 4.14 Distribution of the farmers according to problems faced in sugarcane cultivation

Categories (scores)	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Little problem (up to mean -1sd, i.e.,11-17)	8	8	19.94	1.97
Moderate problem (mean -+1sd, i.e., 18-21)	68	68		
Serious problem (mean +1sd, i.e., above 21)	24	24		
Total	**100**	**100**		

The Table 4.15 indicates that the majority (68 percent) of the farmers faced moderate problem while 24 percent of the farmers faced serious problem. Comparatively few farmers (8 percent) faced little problem in sugarcane cultivation. The findings again revealed that an overwhelming majority (92 percent) of the farmers faced moderate to serious problem.

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

The observed Problem Faced Index of the problems ranged from 9 to 300 against the possible range of 0-300. Problem Faced Index (PFI) of the selected problems are shown in Table 4.15.

On the basis of PFI, it was observed that "high price of fertilizers and pesticides" ranked first followed by "Non-availability of fertilizers and pesticides in time", "insect and pest attack in sugarcane field", "failure of relay crops" "lack of HY varieties", "lack of training facility about sugarcane cultivation", "lack of capital", "difficulty in getting loan", "irrigation problem", "facing problem in of sugarcane", "adverse climate", " lack of skilled labor", "lack of necessary advice and instruction from concern authority" and "difficulty in getting purji from sugar mill" in sugarcane cultivation.

Table 4.15 Problem Faced Index (PFI) with Rank Order

Problems	Number of Farmers				PFI	Rank Order
	Serious Problem	Moderate Problem	Little Problem	No Problem		
High price of fertilizers and pesticides	100	0	0	0	300	1
Non-availability of fertilizers and pesticides in time	97	1	2	0	295	2
Insect and pest attack of sugarcane	61	39	0	0	261	3
Failure of relay crops	0	72	25	3	169	4
Lack of HY varieties	3	63	31	3	160	5
Lack of training facility about sugarcane cultivation	1	32	62	5	129	6
Lack of capital	3	24	63	10	120	7
Difficulty in getting loan	1	33	44	22	113	8
Irrigation problem	1	22	65	9	112	8.5
Facing problem in tying of sugarcane	1	15	79	5	112	8.5
Adverse climate	0	9	86	5	104	11
Lack of skilled labor	1	10	77	12	100	12
Lack of necessary advice and instruction from concerned authority	0	3	4	93	14	13
Difficulty in getting purji from sugar mill	1	1	4	94	9	14

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

Coefficient of correlation was computed in order to explore the relationship between the selected characteristics of the farmers and their problems faced in sugarcane cultivation. The selected characteristics constituted the independent variables and problems faced in sugarcane cultivation by the farmers constituted the dependent variable.

In order to determine the relationship between thirteen selected characteristics (independent variables) of the farmers viz. age, education, family size, land possession, , annual family income, sugarcane cultivation area, credit availability, input availability, organizational participation, extension media contact, innovativeness, training exposure, knowledge and the dependent variable i.e., Problems faced by the farmers in sugarcane 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 variables. Five percent level of significance was used as the basis for rejection of any null hypothesis.

The summery of the results of the Co-efficient of Correlation indicating the relationship between the selected characteristics of the farmers and their problems faced in sugarcane cultivation are shown in Table 4.16.

Table 4.16 Results of Co-efficient of Correlation Showing Relationship between the Selected Characteristics of the Farmers and their Problems Faced in Sugarcane Cultivation

Dependent variable	Independent variables	Observed Co-relation Co-efficient(r)value with 98 d.f	Table value	
			at 0.05 level	at 0.01 level
Problems Faced by the Farmers in Sugarcane Cultivation	Age	0.047^{NS}	0.196	0.256
	Education	-0.267**		
	Family size	-0.030^{NS}		
	Land possession	-0.094^{NS}		
	Annual family income	-0.116^{NS}		
	Sugarcane cultivation area	-0.121^{NS}		
	Credit availability	-0.197*		
	Input availability	-0.297**		
	Organizational participation	-0.150^{NS}		
	Extension media contact	-0.212*		
	Innovativeness	-0.004^{NS}		
	Training exposure	-0.202*		
	Sugarcane cultivation knowledge	-0.217*		

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 sugarcane cultivation

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

The computed value of the co-efficient of correlation (r) between the concerned variables was 0.047 as shown in Table 4.17. 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' (0.047) was smaller than the tabulated value 'r' (0.196) with 98 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 sugarcane cultivation. This indicated that age of the farmer was not an important factor for their problems faced in sugarcane cultivation.

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

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

The computed value of the co-efficient of correlation (r) between the concerned two variables were -0.267 as shown in Table 4.17. 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' (-0.267) was greater than the tabulated value 'r' (0.256) with 98 degrees of freedom at 0.01 level of probability.
- The null hypothesis was rejected.
- 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 sugarcane 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.

4.3.3 Relationship between family size of the farmers and problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.030 as shown in Table 4.17. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.030) was smaller than the tabulated value 'r' (0.196) with 98 degrees of freedom at 0.05 levels of probability.
- The concerned null hypothesis was accepted.
- The relationship showed a negligible negative trend.

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

4.3.4 Relationship between land possession of the farmers and their problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.094 as shown in Table 4.17. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.094) was smaller than the tabulated value 'r' (0.196) with 98 degrees of freedom at 0.05 levels 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 land possession of the farmers had no significant relationship with their problems faced in sugarcane cultivation. Therefore, land possession of the farmers was not an important factor for their problems faced in sugarcane cultivation.

4.3.5 Relationship between annual family income of the farmers and problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.116 as shown in Table 4.17. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.116) was smaller than the tabulated value 'r' (0.196) with 98 degrees of freedom at 0.05 levels 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 sugarcane cultivation. Therefore, annual family income of the farmers was not an important factor for heir problems faced in sugarcane cultivation.

4.3.6 Relationship between sugarcane cultivation area of the farmers and their problems faced in sugarcane cultivation

Relationship between Sugarcane cultivation area of the farmers and their problems faced in sugarcane cultivation were determined by testing the null hypothesis: "There is no relationship between Sugarcane cultivation area of the farmers and their problems faced in sugarcane cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.121 as shown in Table 4.17. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.121) was smaller than the tabulated value 'r' (0.196) with 98 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 sugarcane cultivation area of the farmers had no significant relationship with their problems faced in sugarcane cultivation. Therefore, Sugarcane cultivation area of the farmers was not an important factor for their problems faced in sugarcane cultivation.

4.3.7 Relationship between credit availability of the farmers and their problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.197 as shown in Table 4.17. 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' (-0.197) was larger than the tabulated value 'r' (0.196) with 98 degrees of freedom at 0.05 level of probability.
- The null hypothesis was rejected.

The findings reveal that credit availability of the farmers had significant negative relationship with their problems faced in sugarcane cultivation. This meant that the farmers having more credit availability faced fewer problems in sugarcane cultivation. Lack of capital is a major problem in sugarcane cultivation. This might be the reason for the above findings.

4.3.8 Relationship between input availability of the farmers and their problems faced in sugarcane cultivation

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

The computed value of the co-efficient of correlation (r) between the concerned variables was found to be -0.297 as shown in Table 4.17. 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' (-0.297) was greater than the tabulated value 'r'(0.256) with 98 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 sugarcane cultivation. This meant that the farmers having more input availability face fewer problems in sugarcane 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 sugarcane cultivation.

4.3.9 Relationship between organizational participation of the farmers and problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.150 as shown in Table 4.17. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.150) was smaller than the tabulated value 'r' (0.196) with 98 degrees of freedom at 0.05 levels of probability.
- The concerned null hypothesis was accepted.

4.3.11 Relationship between innovativeness of the farmers and problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.004 as shown in Table 4.17. The following observations were made regarding the relationship between the two variables under consideration.

- The computed value of 'r' (-0.004) was smaller than the tabulated value 'r' (0.196) with 98 degrees of freedom at 0.05 levels 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 innovativeness of the farmers had no significant relationship with their problems faced in sugarcane cultivation. Therefore, innovativeness of the farmers was not an important factor for their problems faced in sugarcane cultivation.

4.3.12 Relationship between training exposure of the farmers and problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.202 as shown in Table 4.17. 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' (-0.202) was larger than the tabulated value 'r' (0.196) 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 significant negative relationship with their problems faced in sugarcane cultivation. This meant that the farmers having more training exposure face fewer problems in sugarcane 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.

4.3.13 Relationship between sugarcane cultivation knowledge of the farmers and their problems faced in sugarcane cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.217 as shown in Table 4.17. 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' (-0.217) was larger than the tabulated value 'r' (0.196) with 98 degrees of freedom at 0.05 level of probability.
- The null hypothesis was rejected.

The findings reveal that sugarcane cultivation knowledge of the farmers had significant negative relationship with their problems faced in sugarcane cultivation. This meant that the farmers having more sugarcane cultivation knowledge face fewer problems in sugarcane cultivation. By sugarcane cultivation knowledge, problems in sugarcane cultivation could be minimized. It was quite logical findings.

Chapter 5

Summary of Findings, Conclusions and Recommendations

CHAPTER 5

SUMMERY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summery 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 13 selected characteristics of the sugarcane farmers summarized below:

Age: Age of the farmers ranged from 21 to 75 years with the average 41.44. The highest proportion (42 percent) of the respondent sugarcane farmers was young aged while 38 percent was middle and 20 percent was old.

Education: Education of the farmers ranged from 0 to 16 years of schooling with the average 4.11. The highest proportion (34 percent) of the respondent sugarcane farmers had Illiterate, while 24 percent had can sign only, 6 percent had primary level, 25 percent had secondary level education and 11 percent had above secondary level.

Family size: Family size of the farmers ranged from 3 to 18 with a mean of 7.06. The highest proportion (39 percent) of the sugarcane farmers had medium family size, while 23 percent had large family size and 38 percent had small family size.

Land possession: Land possession of the respondents ranged from 0.40 to 5.61 hectares with a mean of 1.55 ha. Sixty two percent of the sugarcane farmers had medium land possession, while 32 percent had small land possession and 6 percent had large land possession.

Annual family income: Annual family income of the sugarcane farmers ranged from 32 to 645 thousand Tk. with the mean of 158.04 thousand Tk. The highest proportion (57 percent) of the sugarcane farmers had medium annual family income compared with 34 percent and 9 percent having low and high annual family income respectively.

Sugarcane cultivation area: Sugarcane cultivation area of the sugarcane farmers ranged from 0.07 to 2.00 hectare with a mean of 0.330 ha. Sixty nine percent of the sugarcane farmers had small sugarcane cultivation area, while 27 percent had medium and 4 percent had large sugarcane cultivation area.

Credit availability: Credit availability scores of the sugarcane farmers ranged from 0 to 100 with the mean being 62.05. The majority (48 percent) of the sugarcane farmers had high credit availability, 11 percent had low credit availability, 20 percent had medium Credit availability and 21 percent had no credit availability.

Input availability: The observed input availability scores of the sugarcane farmers ranged from 8 to 13 with the mean of 9.95. The highest proportion (74 percent) of the sugarcane farmers had medium input availability as compared to 26 percent having high input availability.

Organizational participation: The observed organizational participation scores of the sugarcane farmers ranged from 0 to 30 with the mean of 5.59. Thirty seven percent of the sugarcane farmers had very no organizational participation, while 56 percent had low, 7 percent medium organizational participation.

Extension media contact: The scores of the sugarcane farmers regarding extension media contact ranged from 8 to 28 with the mean of 14.92. The majority (50 percent) of the sugarcane farmers had low extension media contact as compared to 46 percent low and 4 percent high extension media contact.

Innovativeness: The observed innovativeness scores of the sugarcane farmers ranged from 11 to 34 with the mean of 23.13. The highest proportion (69 percent) of the sugarcane farmers had medium innovativeness as compared to 26 percent having low innovativeness and 5 percent having high innovativeness.

Training exposure: Training exposure scores of the sugarcane farmers ranged from 0 to 100 with the mean being 10.51. The majority (72 percent) of the sugarcane farmers had no training, 17 percent had low training and 11 percent had medium had high training exposure.

Sugarcane cultivation knowledge: Sugarcane cultivation knowledge score of the sugarcane farmers ranged from 16 to 50 with the mean being 35.30. The highest proportion (57 percent) of the sugarcane farmers had medium sugarcane cultivation knowledge, while 37 percent had high and 6 percent had low sugarcane cultivation knowledge.

5.1.2 Problems faced by the farmers in sugarcane cultivation

The observed problem faced scores of the sugarcane farmers in selected sugarcane cultivation technologies ranged from 11 to 24 against the possible score ranged of 0 to 42. The mean was 19.94. The highest proportion (68 percent) of the sugarcane farmers had medium problem faced while 24 percent had serious problem faced and 8 percent had little problem faced.

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

Among 13 selected characteristics of the farmers, 6 namely, education, credit availability, input availability, extension media contact, training exposure and knowledge had significant negative relationship with their problems faced in sugarcane cultivation and the rest 7 characteristics namely, age, family size, land possession, annual family income, sugarcane cultivation area, organizational participation and innovativeness had no significant relationship with their problems faced in sugarcane cultivation.

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

The observed problem faced index of the problems ranged from 9 to 300 against the possible range of 0-300. Problem Faced Index (PFI) are shown in Table 4.17

On the basis of PFI, it was observed that "high price of fertilizers and pesticides" ranked first followed by "Non-availability of fertilizers and pesticides in time", "insect and pest attack in sugarcane field", "failure of relay crops" "lack of HY varieties", "lack of training facility about sugarcane cultivation", "lack of capital", "difficulty in getting loan", "irrigation problem", "facing problem in of sugarcane", "adverse climate", "lack of skilled labor", "lack of necessary advice and instruction from concern authority" and "difficulty in getting purji from sugar mill" in sugarcane cultivation.

5.2 Conclusions

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

1. About three-fourth (58 percent) of the sugarcane farmers were literate or could sign only. There existed a negative significant relationship between education of the sugarcane farmers and their problem faced. Therefore, it may be concluded that an appreciable proportion of the sugarcane farmers will not

continue to face problems in sugarcane cultivation, if suitable steps are taken to remove illiteracy from the sugarcane farmers.

2. About three-fourth (74 percent) of the sugarcane farmers medium input availability. Input availability of the sugarcane farmers had significant negative relationship with their problem faced. Thus, it may be concluded that problems of farmers in sugarcane cultivation could be minimized by taken necessary steps to increase input availability of the sugarcane farmers.

3. Almost all (96 percent) of the sugarcane farmers had low to medium extension media contact, while there was a negative significant relationship between extension media contact of the sugarcane farmers and their problem faced. Therefore, it may be concluded that the sugarcane farmers will not continue to face problems, if suitable steps are taken to increase extension activities among the sugarcane farmers.

4. An overwhelming (89 percent) of the sugarcane farmers had no or low training exposure, while there was a negative significant relationship between training exposure of the sugarcane farmers and their problem faced. Therefore, it may be concluded that problems of the sugarcane farmers could be minimized by providing necessary training to the sugarcane farmers by the concerned authorities.

5. More than half (52 percent) of the sugarcane farmers had no to medium credit availability, while there was a negative significant relationship between credit availability of the sugarcane farmers and their problem faced. Therefore, it may be concluded that the sugarcane farmers will not continue to face serious problems, if suitable steps are taken to increase credit availability among the sugarcane farmers' cash or kinds.

6. About two-third (63 percent) of the sugarcane farmers had low to medium sugarcane cultivation knowledge, while there was a negative significant relationship between sugarcane cultivation knowledge of the farmers and their problem faced. Therefore, it may be concluded that the sugarcane farmers

could be minimized by providing necessary information by the concerned authorities through various motivational and training programmes.

7. On the basis of PFI, the farmers faced serious problems in high price of fertilizers and pesticide, Non-availability of fertilizers and pesticides in time and insect and pest attack in sugarcane field. Therefore, it may be concluded that necessary steps should be taken by the concerned authorities to minimize these problems with priority.

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 present study revealed that the sugarcane farmers have been facing a lot of problems moderately to seriously in cultivation of this crop. It is, therefore, recommended that effective steps should be taken to minimize these problems by providing necessary information, training, technical advice and credit. It may be further recommended that serious problems should be taken consideration.

2. The education of the farmers is necessary for any development program. In the study area education had high significant negative relationship with problems. Therefore, it may be recommended that if the concern authorities take special programme for the illiterate and low lettered farmers, the problems might be reduced.

3. The study revealed that input availability had high significant negative relationship with problems. So, it may be recommended that concerned authority should supply more inputs to the farmers so that they can overcome the problems.

66

4. Extension media contact of the farmers in the study area has been found to be low to medium. In the study area extension media contact had negative significant relationship with problems. So, it may be recommended that extension provider should increase contact with the farmers that can help them to exchange related information which will be reduced their problems.

5. The study demonstrates that training exposure had significant negative relationship with problems. So, it may be recommended that concern authority should increase training facilities to the farmers in sugarcane cultivation so that they can overcome the problems.

6. Knowledge plays an important role in cultivation of sugarcane effectively and efficiently. The study reveled that sugarcane cultivation knowledge had significant negative relationship with problems. So, it may be recommended that concern authority should provide necessary knowledge on sugarcane cultivation to the farmers so that they can overcome the problems.

7. Farmers who are financially solvent can invest money to increase sugarcane cultivation. The solvent farmers face fewer problems than the poorer farmers. The study demonstrates that credit availability had significant negative relationship with problems. So, it may be recommended that concern authority should supply credit so that they can overcome the problems.

5.3.2 Recommendations for the future study

The following recommendations are made for the future study:

1. The present study conducted on the population of the farmers of 9 villages of Pabna Sadar Upazilla. The findings of the study need to be varied by undertaking similar research in other sugarcane growing zones of the country.

2. The study investigated the relationships of the thirteen selected characteristics of the farmers with their problems faced in sugarcane cultivation. But farmer's problems into sugarcane cultivation might be affected by other various personal, social, psychological, cultural and situational factors of the farmers. It is, therefore, recommended that further study should be conducted involving other characteristics in this regard.

.

3. In addition to problems in sugarcane cultivation, the sugarcane farmers also faced other problems such as social, economic, housing, sanitation, nutrition and domestic etc. Therefore, it may be recommended that research should be conducted relation to other problems of the farmer.

4. The research was conducted to find out the problems of sugarcane cultivation of the farmer. Further research should be taken related to other issues like inter cropping, other crop cultivation etc.

Chapter 6
Bibliography

CHAPTER 6

BIBLIOGRAPHY

Agnew, J. R., G. R. Sandell, G. T. Stainaly, C. Whiteing and D. M. Hogarth. 2002. Increased sugar industry profitability through harvesting best practice. *Proceedings of the 2002 Conference of the Australian Society of Sugarcane Technologist help at Carrns, Queensland, Australia.* 29 April to 2 May, 2002. pp. 184-189.

Ahmed, S. 2002. Problem Confrontation of the Contact Growers of BADC in Jute Seed Production. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education. Bangladesh Agricultural University, Mymensingh.

Akanda, M. G. R. 1993. Problem Confrontation of the Farmers in respect of Cultivating Mukta (BRI 1) Rice. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Akanda, M. G. R., M. A. Kashem. and M. M. Rahman. 1997. Problem Confrontation of the Farmers in Mukta (BR-11) Rice Cultivation Regarding Plant Protection Measures. *Bangladesh Journal of Extension Education*, 9 (Special issue): 133-137.

Alam, A. T. M. M., R., Chowdhury, and M. Z. A. Chowdhury. 2000. Jute Production at Farmers' Level: Practices and Problems. *Bangladesh Journal of Training and Development*, 13(1 & 2): 229-236.

Alam, M. M., M. I. Haque and S. M. Boktiar. 2005. *Bangladesh Journal of Sugarcane*, 24-25: 33-34.

Ali, M. A. 1978. Cattle Problems of the Farmers in Tarakanda Union of Fulpur Thana under Mymensingh District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Ali, M. A. 1999. Opinion of Unemployed Rural Youth on Self Employment by Undertaking Selected Income-Generating Activities in Fulbaria Thana under Mymensingh District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Ali, M. A. and A. B. M. Anwar. 1987. Cattle Problem Confrontation of the Farmers in a Union of Mymensingh. *Bangladesh Journal of Extension Education*, 2(1): 24-27.

Anwar, A. B. M. N. 1994. Study for Involving Rural Youth Activities in Three Selected Villages of Mymensingh District. *Ph.d. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Aziz, M. A. 2006. Constraints Faced by the Farmers in Potato Cultivation in Jhikargacha Upazilla Under Jessore District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka.

Bashar, M. A. 2006. Problem Confrontation of the Farmers in Mushroom Cultivation. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka.

BBS. 2004. Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics, Ministry of Planning, Government of the Peoples Republic of Bangladesh, Dhaka.

BBS. 2006. Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics, Ministry of Planning, Government of the Peoples Republic of Bangladesh, Dhaka.

BEC. 2008. Bangladesh Economic Census, Finance Division, Ministry of Finance, Government of the Peoples Republic of Bangladesh, Dhaka.

Bhuyan, M. A. S. 2002. Constraints Faced by the Farmers in Banana Cultivation Kuliarchar Upazila under Kishorganj District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Biswas, P. R. 1992. An Economic Analysis of Cotton Production in Some Selected Areas of Jessore District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

BSFIC. 1986. Bangladesh Sugar and Food Industries Corporation, Ministry of Industry, Government of the Peoples Republic of Bangladesh, Dhaka.

Chander, S. H. N. and J. P. Sharma. 1990. Knowledge, Adoption and Constrain Analysis of Potato Technology. *Indian Journal of Extension Education*, XXVI (1 &2):94-98.

Faroque, M. G. 1997. Participation of Female Rural Youth in Selected Homestead Activities in Two Selected Villages of Bhaluka Upazila under Mymensingh District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Goode, C. V. 1945. Dictionary of Education. Mc Graw-Hill Book Company, New York.

Gumisiriza, G., W. Wagoire, B. Bungutski and D. G. Tanner. 1994. Wheat Production and Research in Uganda: Constraints and Sustainability. In: Developing Sustainable Wheat Production System. Proceedings of the 8th Regional Wheat Workshop for Eastern, Central and Southern Africa, Kampala, Uganda 7 to 10 June 1993. pp. 5 1-56.

Halim, M. A. 2003. Constraints Faced by the Farmers in Adopting Crop Diversification. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Haque, M. A. 1995. Problem Confrontation of the Members of Mohila Bittaheen Samahaya Samittee Working under the Bangladesh Rural Development Board. *M.S. (Agril. Ext. Edu.) Thesis*, Bangladesh Agricultural University, Mymensingh.

Haque, M. K. 2001. Environmental Awareness and Problem Confrontation of the FFS Farmers in Practicing 1PM. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Haque, M. M. 1993. Adoption of Improved Practices in Sugarcane Cultivation by the Sugarcane Growers of Sherpur Upazilla under Gazipur District. *An M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Huque, M. A. S. 2006. Problem Faced by the Farmers in Using Integrated Plant Nutrient Management. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka.

Hasan, A. F. M. F. 1995. Problem Confrontation of the Block Supervisors in Guiding. Supervising and Managing Results Demonstration. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Hasan, F., M. A. Kashem and M. R. Haider. 1998. Organizational Problem Confrontation of the Block Supervisors in Supervising Result Demonstration. *Bangladesh Journal of Extension Education*, 10(1 & 2): 5 1-57.

Hossain, M. S. 2002. Resource Poor Farmers' Problem Confrontation in Using Manures Towards Integrated Plant Nutrient System (IPNS). *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Hossain, S. M. A. 1985. A Study of the Landless Labourers in Bhahabali Union of Mymensingh District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Hussen, A. M. 2001. Farmers Knowledge and Adoption of' Modem Sugarcane Cultivation Practices. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Islam, M. N. 1987. Artificial Insemination Problem Confrontation of the Farmers in the Two Selected Unions of Madhupur Upazila under Tangail District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training. Bangladesh Agricultural University, Mymensingh.

Ismail. S. M. 2001 . Agricultural Problem Confrontation of the Farm Youth in a Selected Block of Haor Area of Mohanganj Upazila under Netrokona District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of' Agricultural Extension Education. Bangladesh Agricultural University, Mymensingh.

Karim, M. L. 1996. Relationship of Selected Characteristics of Kakrol Growers with Their Problem Confrontation. *M.S. (Agril. Ext. Edu.) Thesis*, Bangladesh Agricultural University, Mymensingh.

Kashem, M. A. 1977. A Study on the Landless of Barakhata Union under Rangpur District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training. Bangladesh Agricultural University, Mymensingh.

Kher, A. O. and K. G. Halyal. 1988. Constraints in Adoption of Sugarcane Production Technology. *Gujrat Agricultural Research Journal*. 13(2): 39-45.

Mansur, M. A. 1989. Farmers Problem Confrontation in Feeds and Feeding Cattle in Sonapur Union of Rajpur Upazila Under Lakshmipur District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Muttaleb, M. A., M .A. Hossain and M. A. Rashid. 1998. Adoption Level and Its Constraints to Selected Recommended Potato Technology. *Bangladesh Journal of Training and Development*, 11(1 & 2): 10 1-108.

Nahid, M. M. H. 2005. Problem Confrontation of the Sugarcane Growers in Sugarcane Production. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Pramanik, N. K. 2001. Crop Cultivation Problems of the Farm Youth in Selected Blocks of Muktagacha Upazila under Mymensingh District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Raha, A. K. 1989. Deep Tube Well Irrigation Problem of the Farmers in the Cultivation of Modern Variety of Boro Paddy in Two Selected Blocks of Muktagacha Upazila under Mymensingh District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Rahman, M. H. 2006. Contraints Faced by the Banana Growers of Sonargaon Upazilla Under Narayanganj District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka.

Rahman, M. F. 1995. Problem Confrontation by the Pineapple Growers in a Selected Area of Tangail District. *M.S. (Agril. Ext. Edu.) Thesis*, Bangladesh Agricultural University, Mymensingh.

Rahman, M. H. 1995. Constraints Faced by the Farmers in Cotton Cultivation. *M.S. (Agril. Ext. Edu.) Thesis*, Bangladesh Agricultural University, Mymensingh.

Rahman, M. S. 1996. Farmers' Problems in Potato Cultivation in Saltia Union. under Gaffargaon Thana of Mymensingh District. *M.S. (Agril. Ext. Edu.) Thesis*, Bangladesh Agricultural University, Mymensingh.

Rashid, M. H. 1975. Agricultural Problems of the Farmers in Madhupur Union of Tangail District. *M..Se. ('Ext. Ed.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Rashid, M. M. 1999. Willingness of Dropout Rural Youth for undertaking Selected Agricultural Entrepreneurship in their Self-employment. *MS. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Rashid, M. Z. 2003. Participation of School Dropout Rural Youth in Selected Agricultural Activities in Two Villages of Mymensingh District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education. Bangladesh Agricultural University, Mymensingh.

Rogers, E. M. 1995. Diffusion of Innovation: 4th ed. New York: The Free Press.

Rosenberg, M. and C.I. Hovland, 1960. Research on Communication and Attitude. Train dis., H.C. 1971. Attitude and Attitude Change, New York : John Wiley Publisher.

Saha, B. K. 1983. Farmers Problem Confrontation in respect of Breeding of Poultry Through Cockrel Exchange Programme and Other Related Aspects in Dewkhali Union of Phulbaria Thana Under Mymensingh District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Saha, N. K. 1997. Participation of Rural Youth in Selected Agricultural Activities in the Villages of Muktagacha Upazila under Mymensingh District. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Salam, M. A. 2003. Constraints Faced by the Farmers in Adoption Environmentally Friendly Farming Practices. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Sarker, G. C. 1983. Relationship of Selected Characteristics of the Poultry Farmers in Tarakanda Union of Mymensingh District. *M.Sc. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Talukder, F. A. H., M. A. Hossain and A. R. Molla. 1991. On farm survey in 8 jute growing upazillas of Taingail District. *Bangladesh Journal of Extension Education*, 6: 65-71.

Uddin, M. J. 2004. Constraints Faced by the Farmers in Commercial Cultivation of Vegetables. *M.S. (Agril. Ext. Edu.) Thesis*, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Appendices

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

AN INTERVIEW SCHEDULE FOR A RESEACH STUDY ON

"PROBLEM FACED BY THE FARMERS IN SUGRCANE CULTIVATION"
(English Version)

Serial No..

Name of the 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?

     i)   Do not know reading and writing......................

     ii)   Do not know reading and writing but can sign only.....................

     iii)   Passed class..

3. How much members are there in your family? ....

4. Land possession

Please mention your Land possession

SL. No.	Type of Land	Land	
		Local unit	Hectare
1.	Homestead area		
2.	Own land under own cultivation		
3.	Land taken from others on lease		
4.	Land given to others as borga		
5.	Land taken to others as borga		
	Total		

5. Annual Family Income

Please state the income of your family from different sources during the last one year

SL. No.	Sources of Income	Total (Tk.)
1.	Sugarcane	
2.	Others crop	
3.	Poultry	
4.	Livestock	
5.	Fisheries	
6.	Business	
7.	Service	
8.	Daily labor	
9.	Others	
Total		

6. Sugarcane cultivation area

Please mention your Sugarcane cultivation area

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

7. Credit Availability

Did you require any credit for sugarcane cultivation during plantation season?

……………………………..Yes   ………………………………….. No

Sources	Credit Required	Credit received	%
Mills authority			
Bank			
Farmers' committee			
Money lender			
Relatives			
Others			
Total			

8. Input availability

Please give your information about following inputs availability

Sl. No.	Inputs	Extent of input availability			
		Regular (3)	Fair (2)	Seldom (1)	Not at all (0)
1.	Availability of modern varieties				
2.	Availability of fertilizers				
3.	Availability of insecticides				
4.	Availability of irrigation water				
5.	Availability of farm implements				

9. Organizational participation

Please mention your involvement with the following organizations during the last five years

SL. No.	Name of the organization	Not Involved	Nature of Involvement and duration		
			Ordinary member (years)	Executive member (years)	Executive Officer (years)
1.	Village farmers' co-operative society				
2.	School committee				
3.	Mosque/Madrasa/Mandir committee				
4.	Youth club				
5.	NGO organized group				

10. Extension Media Contact

Please mention your nature of extension media contact

SL. No.	Extension personnel	Nature of extension contact				
		Regularly	Often	Occasionally	Rarely	Not at all
Personal contact						
1.	Experienced farmers/neighbors	More 5 times/week	4-5 times/ week	2-3 times/ week	1 time/ week	0 time/ week
2.	Dealers (fertilizer, pesticides)	More than 5 times/month	4-5 times/ month	2-3 times/ month	1 time/ month	0 time/ month
3.	Agricultural Officer/CDO	More than 5 times/year	4-5 times/ year	2-3 times/ year	1 times/ year	0 time/ year
4.	Sub-assistant Agricultural Officer/ACDO	More than 5 times/month	4-5 times/ month	2-3 times/ month	1 time/ month	0 time/ month
Group contact						
5.	Result demonstration	2 and more times/year	1 time/ year	1 time/2 year	1 time/ 4year	0 time/ year
6.	Group discussion	More than 5 times/4 month	4-5 times/ 4 month	2-3 times/ 4 month	1 time/ 4month	0 time/ 4 month
7.	Group meeting	More than 5 times/6 month	4-5 times/ 6 month	2-3 times/ 6 month	1 time/ 6month	0 time/ 6 month
Mass contact						
8.	Radio	More than 3 times/week	3 times/ week	2 times/week	1 time/ week	0 time/ week
9.	Television	More than 3 times/month	3 times/ month	2 times/month	1 time/ month	0 time/ month
10.	Reading agricultural news in newspaper	More than 3 times/month	3 times/ month	2 times/month	1 time/ month	0 time/ month

11. Innovativeness

Please indicate the earliness of your use of the following innovations

SL. No.	Name of the technologies	Use within 1 year of hearing	Use after 1 year of hearing	Use after 2 year of hearing	Use after 3 year of hearing	Don't use
1.	Use of Power tiller					
2.	Use of Organic manure					
3.	Use of Green manure					
4.	Seed treatment by using chemicals					
5.	Mechanical control of stem borer					
6.	Use of Gypsum and Zn fertilizer					
7.	Use of detrashing of dry leaves					
8.	Stubble burning after harvesting					
9.	Trench method of transplanting					
10.	STP method					

12. Training exposure

How you received agricultural training

Yes (   )   No (   )

If yes, furnish the following information

SL. No.	Topics of the training course	Duration of training (Day)
1.		
2.		
3.		
4.		
Total		

13. Knowledge on selected sugarcane cultivation technologies

Please answer the following questions

SL. No.	Questions	Mark (s)	Marks obtained
1.	Which soil suitable for sugarcane cultivation?	2	
2.	Mention the suitable time for transplanting the sugarcane.	2	
3.	What are the procedures of preparing the sugarcane seed setts?	2	
4.	What is pre-germinating system and how to produce seedling in this method?	2	
5.	What is Poly-bag system and how to produce seedling in this method?	2	
6.	What is the proper age of sugarcane for using as seed?	2	
7.	What is the requirement of sugarcane seed sett for transplanting per hectare? (Traditional & STP)	2	
8.	What is the procedure of sugarcane cultivation in traditional system?	2	
9.	What is STP system and how it is done?	2	
10.	What is Trench system and how it is done?	2	
11.	What are the advantages of early plantation?	2	
12.	Mention the recommended dose fertilizer in sugarcane cultivation	2	
13.	How many times urea is used for top dressing?	2	
14.	What intercultural operations are practiced in sugarcane cultivation?	2	
15.	Mention the times of earthing up for sugarcane	2	
16.	Mention the time of sugarcane tying	2	
17.	How many times irrigation needed for in sugarcane cultivation?	2	
18.	Mention the relay crops that can be grown with sugarcane	2	
19.	Name two modern varieties of sugarcane	2	
20.	Name two harmful insects of sugarcane	2	
21.	What are the control measures of harmful insects of sugarcane cultivation?	2	
22.	Name two diseases of sugarcane.	2	
23.	What are the control measures of diseases in sugarcane cultivation?	2	
24.	Is ratooning cane cultivation profitable and why ?	2	
25.	Mention the average yield of sugarcane per hectare.	2	
Total			

14. Problem faced in selected sugarcane cultivation technologies

Please mention the extent of problems you faced in sugarcane cultivation

SL. No.	Problems	Extent of problems			
		Serious problem	Moderate problem	Little problem	No problem
1.	Lack of capital				
2.	Lack of high yielding varieties				
3.	Adverse climate				
4.	Insects and pest attack in sugarcane field				
5.	Non-availability of fertilizers and pesticides in time				
6.	High price of fertilizers and pesticides				
7.	Irrigation problem				
8.	Facing problem in tying of sugarcane				
9.	Failure of relay crops				
10.	Lack of skilled labor				
11.	Difficulty in getting purji from sugar mill				
12.	Difficulty in getting loan				
13.	Lack of necessary advice and instruction from concern authority				
14.	Lack of training facility about sugarcane cultivation				

Thanks for your cordial participation.

Date...........................

....
Signature of the interviewer

APPENDIX B

Correlation Matrix of Dependent and Independent Variables

Variable	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	Y
X1	1													
X2	$.023^{ns}$	1												
X3	$.365^{**}$	$.079^{ns}$	1											
X4	$.269^{**}$	$.095^{ns}$	$.593^{**}$	1										
X5	$.186^{ns}$	$.242^{*}$	$.481^{**}$	$.397^{**}$	1									
X6	$.225^{*}$	$-.104^{ns}$	$.508^{**}$	$.600^{**}$	$.333^{**}$	1								
X7	$.003^{ns}$	$-.096^{ns}$	$.190^{ns}$	$.070^{ns}$	$.237^{*}$	$.072^{ns}$	1							
X8	$.114^{ns}$	$.142^{ns}$	$.114^{ns}$	$.092^{ns}$	$.185^{ns}$	$.000^{ns}$	$.037^{ns}$	1						
X9	$.318^{**}$	$.184^{ns}$	$.277^{**}$	$.360^{**}$	$.375^{**}$	$.209^{*}$	$.086^{ns}$	$.117^{ns}$	1					
X10	$.256^{*}$	$.448^{**}$	$.321^{**}$	$.343^{**}$	$.493^{**}$	$.168^{ns}$	$.268^{**}$	$.264^{**}$	$.477^{**}$	1				
X11	$.090^{ns}$	$.165^{ns}$	$.350^{**}$	262^{**}	$.395^{**}$	$.195^{ns}$	$.100^{ns}$	$-.236^{*}$	$.073^{ns}$	$.309^{**}$	1			
X12	$.016^{ns}$	$.250^{*}$	$.173^{ns}$	$.135^{ns}$	$.227^{*}$	$.342^{**}$	$.086^{ns}$	$.144^{ns}$	$.122^{ns}$	$.203^{*}$	$-.139^{ns}$	1		
X13	$.182^{ns}$	$.353^{**}$	$.426^{**}$	$.491^{**}$	$.474^{**}$	$.361^{**}$	$.161^{ns}$	$.231^{*}$	$.285^{**}$	$.584^{**}$	$.146^{ns}$	$.307^{**}$	1	
Y	$.047^{ns}$	$-.267^{**}$	$-.030^{ns}$	$-.094^{ns}$	$-.116$	$-.121^{ns}$	$-.197^{*}$	$-.297^{**}$	$-.150^{ns}$	$-.212^{*}$	$.0042^{ns}$	$-.202^{*}$	$-.217^{*}$	1

^{NS} = Not Significant

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

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

X1 = Age
X2 = Education
X3 = Family Size
X4 = Land Possession
X5 = Annual Family Income
X6 = Sugarcane Cultivation Area
X7 = Credit Availability

X8 = Input Availability
X9 = Organizational Participation
X10 = Extension Media Contact
X11 = Innovativeness
X12 = Training Exposure
X13 = Knowledge
Y = Problems faced in sugarcane cultivation