CONSTRAINTS FACED BY THE BANANA GROWERS OF SONARGAON UPAZILA UNDER NARAYANGONJ DISTRICT

BY

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CERTIFICATE

This to certify that the thesis entitled, **"CONSTRAINTS FACED BY THE BANANA GROWERS OF SONARGAON UPAZILA UNDER NARAYANGONJ DISTRICT"** submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (MS)** in **AGRICULTURAL EXTENSION & INFORMATION SYSTEM** embodies the result of a piece of *bona fide* research work carried out by **MOHAMMAD HABIBUR RAHMAN,** Roll No. 00361, Registration No. 00361 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

Dated:.....
Dhaka, Bangladesh.

.....
(Professor Md. Shadat Ulla)
Supervisor

DEDICATED

TO

MY BELOVED PARENTS

ABBREVIATIONS AND ACRONYMS

SAU	:	Sher-e-Bangla Agricultural University
BBS	:	Bangladesh Bureau of Statistics
DAE	:	Department of Agricultural Extension
NGO	:	Non Governmental Organization
IPM	:	Integrated Pest Management
et al	:	Associates
i.e.	:	That is
LSD	:	Least Significant Difference
NS	:	Not-significant
*	:	Significant at 0.05 level of probability
**	:	Significant at 0.01level of probability
***	:	Significant at 0.001 level of probability
df	:	Degrees of Freedom
SPSS	:	Statistical Package for Social Science
Fig.	:	Figure
Tk.	:	Taka
Ha.	:	Hectare
FAO	:	Food and Agricultural Organization
r	:	Co-efficient of Correlation
CFI	:	Constraint Facing Index

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The Author

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CONSTRAINTS FACED BY THE BANANA GROWERS OF SONARGAON UPAZILA UNDER NARAYANGONJ DISTRICT

ABSTRACT

The main objective of this study was to find out the extent of constraints faced by the banana growers in banana cultivation in the five selected aspects namely improved banana sucker, disease, agricultural credit, field management and marketing and to explore the relationships between the constraints faced by the growers in respect of cultivating banana and their nine selected characteristics. Data were collected by interview procedure from 50 selected growers out of 250 banana growers (i.e. 20 percent) from selected area Sonargaon upazila under Narayangonj district. Findings of the study indicated that growers faced 34, 38 and 28 percent of high, medium and low constraints respectively in improved sucker. In case of disease, it was found that the growers faced 24, 68 and 8 percent of high, medium and low constraints respectively. In case of agricultural credit, it was found that the growers faced 26, 32 and 28 percent of high, medium and low constraints respectively and 14 percent did not take any loan. In case of field management, it was found that the growers faced 16, 70 and 14 percent of high, medium and low constraints respectively. In case of marketing, it was found that the growers faced 36, 58 and 6 percent of high, medium and low constraints respectively. The comparative constraints faced by the banana growers in the five selected aspects was shown using constraints facing index (CFI). The CFI indicate that the banana growers faced high constraints in marketing (CFI of 230), diseases came next (CFI of 216), then improved banana sucker (CFI of 206), field management (CFI of 202) and agricultural credit (CFI of 170) respectively. The average constraints facing score was 53.3 with 20, 64 and 16 percent banana growers faced high, medium and low constraints respectively. Statistical test showed that education, farm size, area under banana cultivation, annual income, agricultural knowledge, social participation and extension contact of banana growers had significant negative relationships with their different constraints (improved sucker, disease, agricultural credit, field management, marketing and overall constraints). However, age and family size of the banana growers had no significant relationships with their constraints facing.

CHAPTER I

INTRODUCTION

Traditionally and predominantly Bangladesh is an Agricultural country. About 84.5% of her population is rural based and directly or indirectly depend on agriculture (BBS 1998). Agriculture still remains the largest sector of the economy in Bangladesh, which contributes about 21.77% gross domestic product in the economy of Bangladesh (BBS 2005). Agriculture also supplies raw materials for industrial production and food stuff for human and animal consumption.

Bangladesh has a very rich alluvial soil and moderate climate congenial to the growth of various crops and fruits (i.e. Rice, Wheat, Jute, Maize, Banana, Papaya, Mango, Jackfruit etc) throughout the year. But constraints in agriculture are multifaced. The cause may be due to the fact that the agriculture as a whole remains to be traditional with its century old cultural practices and local crop varieties. That is why per unit yield of the major crops is one of the lowest in the world. Realizing the situation the Government has taken up various programmes to improve the situation. Now a days, Governments and Non-government sectors like, NGOs are trying to produce more fruit crops under the tree plantation

But the availability of fruits in Bangladesh is very pathetic when compared with other countries. Only 63 grams of fruits are available per capita per day in Bangladesh against 128 grams in Thailand, 123 grams in Philippines, 121 grams in Japan, 71 grams in Malaysia and 139 grams in U. K. The per capita consumption of fruits should be at least 4 ounces, that is, 116 grams. Therefore, the total availability of fruits in Bangladesh requires to be at least doubled and continue to be increased with the increase of population.

The Banana (*Musa spp*) is one important tropical fruits. Banana occupies an important position among the fruits of Bangladesh not only for its highest production among the fruits but also for its increasing popularity among the farmers as an economic crop. According to production, banana is the first in Bangladesh and second according to cultivated land. Area, production and yield of different fruits in Bangladesh (1997-1998 & 1998-1999) are shown in Table 1.

Table 1. Area, production and yield of different fruits in Bangladesh

Fruits	1997-1998			1998-1999		
	Area (1000ha)	Production (1000) ton	Yield (ton/ha)	Area (1000 ha)	Production (1000) ton	Yield (ton/ha)
Banana	39	625	15.6	39	562	14.4
Mango	51	187	3.7	50	187	3.7
Pineapple	14	149	10.6	15	146	9.7
Jackfruit	27	267	9.9	27	267	9.9
Papaya	6	41	6.8	6	40	6.7
Water Melon	12	96	8.0	12	97	8.1
Lichi	5	13	2.6	5	13	2.6
Guava	10	46	4.6	10	46	4.6
Orange	1	1.1	1.1	1	1	1
Lime & lemon	4	12	3.0	4	13	3.3
Betel nut	36	36	0.8	36	28	0.8
Coconut	32	89	2.8	31	89	2.9
Palmyra Palm	3	85	28.3	3	84	28
Other citrus fruit	3	8	2.7	3	8	2.7
Palm	12	238	19.8	12	248	20.7
Jujube	4	15	3.8	4	15	3.8
Other fruits	10	35	3.5	23	35	1.5
Total	270	1935	7.17	281	1879	6.69

Source: Monthly statistical bulletin of Bangladesh, April, 2000.

Banana is one of the oldest fruits in Bangladesh. Banana has been cultivated in Bangladesh from pre-historic times. Banana is very popular, cheap and tasty. In Bangladesh, Banana is the cheapest fruit compared with other fruits are shown in table 2.

Table 2. Comparison price of banana with other fruits

Fruits	Quantity	Price / Fruit
Banana	1	2-3 Tk
Apple	1	8-10 Tk
Orange	1	8-10 Tk
Guava	1	5-8 Tk
Mango	1	10-20Tk
Papaya	1	25-40Tk

Source: Physical verification by researcher

Banana is not only readymade delicious food but they are also valued for their vitamin and mineral contents. Ripe bananas are sugary and easily digestible and are eaten raw as a desert fruit. Unripe banana fruits are cooked and provide a starch food Minerals, Vitamins and nutrients of Banana are given below in Table 3.

Table 3. The composition of the pulp of banana is given below

Nutrients	Percent	Minerals & Vitamins	Amount (ppm)
Moisture	70.0	Phosphorus	290.
Carbohydrate	27.0	Calcium	80.0
Protein	1.2	Iron	6.0
Crude fibre	0.5	*B*-Carotene	0.5
Fat	0.3	Riboflavin	0.5
Ash	0.9	Niacin	7.0
		Ascorbic acid	120

Source: Anonymous, 2001

There were more than 40 varieties available in Bangladesh. But a particular variety is known by more than one name in different places and the actual number may be around 32. The important banana varieties grown in Bangladesh are Amritasagor, Sabri, Champa, Kabari, Japkathli, Ganasundari etc.

Inspire of greater potentiality of banana cultivation, the growers of Bangladesh are not free from problems in cultivating banana. Therefore, constraints in the scientific cultivation of banana as perceived by the growers might be influenced by their personal, economic, social and essential to have an understanding of the banana cultivation constraints faced of the growers and its relationship with their various characteristics for effective planning and execution of increasing banana cultivation in Bangladesh.

Therefore, the purpose of the study was to have an understanding of the problems faced by the banana growers of selected Sonargaon upazila under Narayangonj district. It was anticipated that such a study would discover the causes of the problems related to cultivation, marketing, processing and storing of banana as well as help in planting an effective measure for banana production all over the country.

Statement of the Problem

In view of the need for having an understanding of the grower's constraints in banana cultivation, the researcher undertook this piece of research entitled "Constraints faced by the banana growers of Sonargaon upzila under Narayangonj district". The study will highlight how much problems are faced by the growers in respect of-

a) Improved sucker

b) Disease

c) Agricultural credit

d) Field management

e) Marketing

The purpose of the study was to find out the answers of the above problems faced by the banana growers in banana cultivation. For a clear insight, the study also explored the relationships of the selected characteristics of the banana growers with their faced constraints. The study aims to find out the answers of the following questions:

1) What were the constraints faced by the banana growers in respect of

a) Improved banana sucker b) Disease

c) Agricultural credit d) Field management

e) Marketing?

2) What were the characteristics of the banana growers?

3) What were the relationships between the constraints and characteristics of the banana growers?

To get the answers of the above questions, the researcher undertook this piece of research programme entitled "Constraints faced by the banana growers of Sonargaon upazila under Narayangonj district."

Specific Objectives:

The following specific objectives were formulated for giving proper direction of the study.

1. To determine the extent of constraints faced by the growers in cultivation of banana on following aspects-

    a) Improved banana sucker

    b) Disease

    c) Agricultural credit

    d) Field management

    e) Marketing

2. To determine and describe the selected characteristics of the growers.

    i) Age

    ii) Education

    iii)Family size

    iv) Farm size

    v) Area under Banana cultivation

    vi) Knowledge in Banana cultivation

    vii) Annual income

    viii) Social Participation

    ix) Extension contact

3. To explore the relationship between the constraints faced by the growers in banana cultivation and their selected characteristics.

Scope and Limitations of this Study:

The study was undertaken with a view to have an understanding of the constraints faced by the growers in banana production. In order to conduct the research in a meaningful and manageable way it becomes necessary to impose some limitation in regard to certain aspects of the study. Considering the limitation of time, money and other resources of the researcher, the following limitations have been observed throughout the study.

1. The study was confined to Sonargaon upazila under Narayangonj district.
2. The study was limited to the banana growers and relevant data were collected from sample of the population of the study.
3. There were various aspects in banana cultivation and many sorts of constraints connected with this issue. It was not possible for the researcher to include all aspects of banana production constraints in a single study. In this study the researcher studied the constraints faced by banana growers in respect of five dimensions, namely, improved banana sucker, diseases, field management, credit and marketing.
4. Relationship of the constraints in banana cultivation could be studied with the various characteristics of the growers, but only 9 characteristics of the growers were selected for investigation in this study.

Assumptions

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

1. The respondents selected for this study were competent to satisfy the queries designed by the investigator.
2. The responses furnished by the respondents were reliable. They express the truth while passing their opinions and providing information.
3. The researcher who acted as interviewer was well adjusted to the social environment of the study area. Hence the data collected by him from the respondents were free from bias.
4. The views and opinions furnished by the banana growers included in sample were the representative views and opinions of all the banana growers of the study area.

Definition of Terms:

Certain important terms used in this study are operationally defined and interpreted for clarity of understanding in this section:

Age:

Age of a banana grower is defining in terms of actual years from his birth to the time of interview in this study. It was measured in terms of year.

Education:

Education of a banana grower's refers to the development of desirable knowledge, skills and attitude in an individual through the experience of reading, writing and related activities. It was measured in terms of years of successful schooling completed by him.

Farm Size:

Farm size refers to the total area of a banana grower's which included with his own house, own land under own cultivation, area taken on borga system, area given to others on borga system and area taken from others on lease. A banana grower was considered to have full benefit from the own land under own cultivation and area taken from others on lease and half benefit from the area taken on borga system or area given to others on borga basis.

Knowledge in Banana Cultivation:

It refers to the knowledge of banana growers about the basic understanding of the grower's different aspects of banana cultivation.

Area under Banana Cultivation:

Area covered by banana cultivation in the last season of collecting the data was considered as the area under banana cultivation of a respondent and it measured by hectares.

Annual Income:

It is defined as the total yearly income by a banana grower and other family members both from agriculture including banana cultivation and other sources (service, business, daily labor etc.). It was measured in taka.

Extension Contact:

The extension contact of a respondent is defined as a respondent contact with different extension media and influence himself in different activities of agriculture through different extension agents.

Social Participation:

Social participation of a grower refers to his taking part in different social organization either as ordinary members, executive committee member or an officer.

Innovativeness:

Innovativeness indicates the degree to which an individual is relatively earlier to adopt new ideas than other member of his social system.

Marketing:

The term marketing means the entire process during the flow of goods and services from producer to consumer. Marketing include the commercial transaction of buying and selling, as well as physical distribution.

Banana Growers:

Banana growers refer to those who cultivated banana in the last season of collecting data. They also cultivate other crops besides banana.

Banana Cultivation:

Banana cultivation refers to the different steps of banana production, harvesting, storing, processing and conservation as well as marketing of the banana.

Constraints in Banana Cultivation:

Constraints of the banana cultivation are defined as the extent of difficulties faced by the growers in banana cultivation in the different selected aspects.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to review the researches conducted in line of the major focuses of study. This study as already indicated, was undertaken to have an understanding of the constraints faced by the growers in banana cultivation and its relationship with the selected characteristics. The researcher, however, made a frantic search in possible avenues to locate relevant studies but it was found that little research has been conducted in this field in Bangladesh. The researcher extensively reviewed the available literature to search out related works in Bangladesh as well as in other countries. But a few researches exploring the relationship of the characteristics of the individuals with their faced constraints came to the notice of the researcher.

Literature having relevance to the present study has been reviewed in two sections. The first section dealt with the literature on the constraints faced by growers in cultivating various crops and the second section dealt with review of studies dealing with the relationships between selected characteristics and faced constraints.

This chapter describes the reviews of researches related to this study. The researcher made an exhaustive search to collect the first findings on the constraints faced on any aspect of agriculture.

However, the available reviews of literatures in connection with this study are briefly discussed below:

Studies Dealing with the Constraints Faced by the Growers in Banana Cultivation and Other Crops:

Rahman (1979) in his article showed that one of the greatest problems the farmers faced in the hill area is the marketing of the agricultural produce particularly of the perishable goods like banana, pineapple, etc.

Chander *et al.* (1990) in their study identified constraints in potato cultivation. Main constraints were ignorance about improved cultivars and cultivation practices; ignorance about scientific method of sowing; lack of guidance of marketing of potato; high cost of improved cultivars; high cost of fertilizers, pesticides and irrigation; lack of enough space for storing potatoes scientifically and so on.

Baksh *et al.* (1991) in their study identified several constraints that reduced higher production and profit of pineapple cultivation. The major constraints were marketing problems, lack of improved production technology and lack of institutional credit. Pineapple marketing was a problem to about 96% farmers. During peak harvest time, price of pineapple fell down due to monopoly business of the "Aratdars" and pineapple merchants. High marketing cost paid to middleman, market toll and subscriptions given to local "Mastans" were the major problems of pineapple.

Biswas (1992) in his study, identified farmers faced problems in cotton cultivation. Non availability of quality seed in time, unfavorable and high cost of fertilizer and insecticides, lack of operating capital, not getting fair weight and reasonable price according to grade, affects of cattle in cotton field, lack of technical knowledge, lack of storage facility, stealing from field at maturity stage and late buying of raw cotton by cotton development board were identified as major problems of cotton farmer sin Jessore district.

Barman (1995) in his study found that transporting the products shares more than 80% of total marketing cost. Almost 80% respondents reported that inadequate transport and its higher cost involvement were the major problems in marketing in study area. As such the producers and the business parties involved could not shift pineapple to the markets where there was a higher demand for it.

Findings of Researches on the Relationships of the Selected Characteristics with Problem Confrontation:

Age and Constraints Faced by the Growers in Banana Cultivation:

Rashid (1975) conducted a study to determine the relationship between the personal characteristics and agricultural constraints faced by the farmers in Madhupur union of Tangail district. He states that there was no relationship between age of the farmers and the agricultural problem confrontation.

Nath (1974) conducted a study to identify the relationships between the selected personal characteristics and constraints faced of the union Assistant of Mymensingh agricultural district. No relationship was found between age of the union assistant and their constraint problem confrontation.

Kashem (1977) in his study on the landless labourers on Barakhata union under Rangpur district examined the relationship between age of landless labourers and their problem confrontation. He found that there was no relationship between age of the landless labourers and their problem confrontation.

Ali (1978) in his study determined the extent of problems faced by the farmer of Phulpur upazila under Mymensingh district in four selected aspects of improved cattle management. He found a positive relationship between age and cattle problem confrontation of farmers.

Saha (1983) in a study on poultry problem confrontation in respect of breeding of poultry stated that there was no relationship between age of the farmers and their poultry problem confrontation. But a negative trend was found i. e. the younger farmers faced more poultry problem.

Sarker (1983) stated that age of the farmers had a significant negative relationship with their poultry problem confrontation.

Islam (1987) in his study on artificial insemination problems faced by farmers in two selected union of Madhupur upazila under Tangail district observed that age of the farmers had no significant relationship with their problem confrontation.

Shahidullah (1987) in his study of production, consumption and marketing behaviour of the poultry farmers found that negative relationship between age of the farmers and production, consumption and marketing behaviour.

Hossain (1989) in a study on landless labourers in Bhabakhali union of Mymensingh district found that there was no relationship between age of the landless labourers and their problem confrontation.

Raha (1989) in his study on deeptubewell irrigation problems of farmers in the cultivation of modern variety of boro paddy observed that there was no relationship between the age of the farmers and irrigation problems confrontation. However, the relationship showed a positive trend.

Mansur (1989) in his study on the feeds and feeding problems confrontation found that there was no significant relationship between the age of the farmers and feeds and feeding problems confrontation.

Rahman (1995) in his study on constraints faced by the farmers in cotton cultivation at Muktagacha thana under Mymensingh district observed that there was no significant relationship between the age of the farmers and their faced constraints in cotton cultivation.

Education and Constraints Faced by the Growers in Banana Cultivation:

Rashid (1975) conducted a study to determine the relationship between the personal characteristics and agricultural constraints faced by the farmers in Madhupur union of Tangail district. He states that there was no significant relationship between education of the farmers and the agricultural problem confrontation.

Kashem (1977) in his study on the landless labourers on Barakhata union under Rangpur district examined the relationship between education of landless labourers and their problem confrontation. He found a significant negative relationship between education of the landless labourers and their problem confrontation.

Ali (1978) in his study determined the extent of problems faced by the farmer of Phulpur upazila under Mymensingh district in four selected aspects of improved cattle management. He found that there was no significant relationship between level of education of the farmers and cattle problem confrontation of farmers.

Hossain (1979) observed that education had a negative effect on problem confrontation. He observed that some of the group members who could read and write after giving them literacy education, could then approach the bank independently for their credit needs.

Saha (1983) in his study on poultry problem confrontation in respect of breeding of poultry stated that there was negative relationship between education of the farmers and their poultry problem confrontation.

Islam (1987) in his study on artificial insemination problem confrontation of the farmers found a negative significant relationship between education and poultry problem confrontation.

Raha (1989) in his study on deeptubewell irrigation problems of farmers in the cultivation of modern variety of boro paddy observed that there was no significant relationship between the education of the farmers and irrigation problems confrontation. However, a positive trend was noticed in the relationship.

Mansur (1989) in his study on the feeds and feeding problems confrontation found a significant negative relationship between the education of the farmers and feeds and feeding problems confrontation.

Rahman (1995) in his study on constraints faced by the farmers in cotton cultivation at Muktagacha thana under Mymensingh district observed had significant negative relationship between the education of the farmers and their faced constraints in cotton cultivation. The findings indicated that the higher the education of the farmers, the lower was their faced constraint in cotton cultivation.

Family Size and Constraints Faced by the Growers in Banana Cultivation:

Size of family is an important dimension which determines the financial and other resources to the individual family members. The size of family may affect the family atmosphere which in turn may determine the extent to which an individual will be able to pay proper attention to his duties and responsibilities. The effect of family size on the performance as well as on problem confrontation has been amply expressed by stanger (1961) when he says:

"The father may feel that because of the children may stay on a dirty, irritating job; but in the process may be unconsciously blame them and treat them with less affection than would otherwise be the case or he may simply build up tension on the job which cannot express for fear of discharge and so these are vented on noisy active youngsters when he comes home".

Karim (1974) in his study of relationships of selected economic, social and psychological characteristics of the union assistants of Mymensingh agricultural district with their problem confrontation examined the relationship between family size of the union assistants and their problem confrontation. He found that there is no relationship between family size f the union assistant and their problem confrontation.

Farm Size and Constraints Faced by the Growers in Banana Cultivation:

Lionberger (1966) after reviewing the situational factors from the related literature in the field of adoption of new ideas and practices concluded that size of farm was nearly always positively related to the adoption of new farm practices.

Gaikwad et al. (1969) also found a positive relationship between size of farm and adoption behaviour.

Rashid (1975) in his study found that there was no relationship between the farm size and their agricultural problem confrontation.

Kashem (1977) in his study on the landless labourers on Barakhata union under Rangpur district examined the relationship between farm size of landless labourers and their problem confrontation. He found a significant negative relationship between barga farm size of the landless labourers and their problem confrontation.

Ali (1978) in his study found a negative relationship between the farm size of the farmers and cattle problem confrontation of farmers.

Saha (1983) found a negative relationship between farm size of the farmers and popular constraints faced by the farmers in his study.

Sarker (1983) found that farm size of the farmers had a significantly negative influence on their poultry constraints faced.

Hossain (1989) in a study on landless labourers in Bhabakhali union of Mymensingh district found a significant relationship between borga farm size of the landless labourers and their problem confrontation.

Islam (1987) in his study on artificial insemination problem confrontation of the farmers found a negative significant relationship between farm size of the farmers and poultry problem confrontation.

Mansur (1989) in his study on the feeds and feeding problems confrontation found a significant negative relationship between the farm size of the farmers and feeds and feeding problems confrontation.

Rahman (1995) in his study on constraints faced by the farmers in cotton cultivation at Muktagacha thana under Mymensingh district observed had significant negative relationship between the farm size of the farmers and their faced constraints in cotton cultivation.

Area under Banana Cultivation and Constraints Faced by the Growers:

Ali (1978) in his study found a negative relationship between the cattle strength of the farmers and their problem confrontation.

Islam (1987) in his study on artificial insemination problem confrontation of the farmers found that cattle strength of the farmers had a significant negative influence on their artificial insemination problem confrontation.

Raha (1989) in his study on deeptubewell irrigation problems of farmers in the cultivation of modern variety of boro paddy observed that there was no significant relationship between the farmer's area under irrigation and irrigation problems confrontation. However, a positive trend was noticed in the relationship.

Mansur (1989) in his study on the feeds and feeding problems confrontation found that there was no relationship between the cattle strength of the farmers and feeds and feeding problems confrontation. However, the relationship showed a negative trend.

Rahman (1995) in his study found that area under cotton cultivation of the farmers had a significant negative influence on their faced constraints in cotton cultivation. The findings indicated that the farmers with larger area under cotton cultivation faced low constraints in cotton cultivation.

Agricultural Knowledge in Banana Cultivation and Constraints Faced by the Growers:

Karim (1974) in his study found that there was no significant relationship between technological knowledge of the union assistant and their problem confrontation.

Ali (1978) in his study found that there was no significant relationship between the technological knowledge about the cattle with the problem confrontation of farmers.

Saha (1983) in his study found a negative relationship between the technological knowledge about the poultry of the farmers and constraints faced by the farmers in this study.

Sarker (1983) in his study found that education and poultry knowledge of the farmers had a significantly negative influence on their poultry constraints faced.

Mansur (1989) in his study on the feeds and feeding problems confrontation found a significant negative relationship between the technological knowledge in feeds and feeding cattle of the farmers and feeds and feeding problems confrontation.

Raha (1989) in his study found that knowledge in modern boro paddy of the farmers had no significant relationship with their irrigation problems confrontation. However, a positive trend was noticed in the relationship.

Rahman (1995) in his study on constraints faced by the farmers in cotton cultivation at Muktagacha thana under Mymensingh district observed had a significant negative relationship between the technological knowledge in cotton cultivation of the farmers and their faced constraints in cotton cultivation.

Annual Income and Constraints Faced by the Growers in Banana Cultivation:

Karim (1974) in his study found that there was no significant relationship between technological knowledge of the union assistant and their problem confrontation, but a consistent negative trend was observed between the annual incomes of the union assistant with their constraints faced.

Rashid (1975) in his study found that there was no relationship between the annual income of the farmers and their agricultural problem confrontation.

Kashem (1977) in his study examined the relationship between annual income of landless labourers and their problem confrontation. Though the relationship was not statistically significant, the data indicated an appreciable negative trend between the two variables.

Ali (1978) in his study found that there was no significant relationship between the annual income of the farmers from the cattle and the problem confrontation of farmers.

Saha (1983) in his study found a positive relationship between the annual income of the farmers and poultry constraints faced by the farmers in this study.

Hossain (1989) in his study on landless labourers in Bhabakhali union of Mymensingh district found a significant positive relationship between annual income of the landless labourers and their problem confrontation.

Islam (1987) in his study on artificial insemination problem confrontation of the farmers found a negative significant relationship between annual income of the farmers and poultry problem confrontation.

Mansur (1989) in his study on the feeds and feeding problems confrontation found a significant relationship between the annual income of the farmers and feeds and feeding problems confrontation, but showed a negative trend.

Raha (1989) in his study found that annual income of the farmers had no significant relationship with their irrigation problems confrontation. However, a positive trend was noticed in the relationship.

Rahman (1995) in his study found that a significant negative and substantially relationship between the annual income of the farmers and their faced constraints in cotton cultivation.

Social Participation and Constraints Faced by the Growers in Banana Cultivation:

Mahboob (1966) undertook a study on the personality characteristics of the male country extension personal in Wisconsin. Based on the findings of his study he concluded that participation in organization is desirable for extension worker as it develops leadership qualities. The conclusion suggests that organizational participation of individuals may lessen their constraints faced and thus enhance their performance.

Wilson (1963) studied the characteristics of adults associated with leadership and interest in youth organization and came out with a series of findings. The findings implied that the efforts of professional workers in youth organizations would be more effective, if local leaders were recruited from among adults who have previous experience of participation in community organization and adult education program. These facts suggest that organizational participation may have the effect of lessening the problem confrontation of individuals.

Karim (1974) in his study found a negative significant relationship between organizational participation of the union assistant and their problem confrontation.

Rashid (1975) in his study found that there was no significant relationship between the organizational participation of the farmers and their agricultural problem confrontation.

Ali (1978) in his study found a negative significant relationship between the organizational participation of the farmers from and the problem confrontation of farmers.

Saha (1983) in his study found a negative relationship between the organizational participation of the farmers and poultry constraints faced by the farmers in this study.

Hossain (1985) in his study on landless labourers in Bhabakhali union of Mymensingh district found a significant positive relationship between annual income of the landless labourers and their problem confrontation.

Islam (1987) in his study on artificial insemination problem confrontation of the farmers found that there was no significant relationship between the organizational participation of the farmers and poultry problem confrontation.

Mansur (1989) in his study on the feeds and feeding problems confrontation found a negative significant relationship between the organizational participation of the farmers and feeds and feeding problems confrontation.

Raha (1989) in his study found that the organizational participation of the farmers had no significant relationship with their irrigation problems confrontation.

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

Extension Contact and Constraints Faced by the Growers in Banana Cultivation:

Rashid (1975) in his study found that there was a negative relationship between the cosmopolite ness of the farmers and their agricultural problem confrontation.

Kashem (1977) in his study found that there was a negative relationship between the cosmopolite ness of the landless labourers and their problem confrontation.

Raha (1989) in his study found that extension contact of the farmers had no significant relationship with their irrigation problems confrontation. However, a negative trend was noticed in the relationship.

Rahman (1995) in his study found that a significant negative relationship between the extension contact of the farmers and their faced constraints in cotton cultivation. i. e. Higher the extension contact of the farmers, the lower was their constraints facing.

CHAPTER III

METHODOLOGY:

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

Location of the Study:

Sonargaon upazila under Narayangonj district was selected as the area for this research work which consists of 10 unions & 1 Pourosova. Data collected from a sample of the banana growers from 7 unions (Aminpur pourosova, Baider Bazar, Kachpur, Jampur, kachpur, Mugrapara and pirujpur union) out of 11 unions and 17 villages out of 85 villages of those 7 unions.

Population and Sampling:

All of the banana growers of these 17 villages were selected for this study. At first prepared a list of the banana growers of these 17 villages with the help of local union parishad members, chairman and upazila Agricultural officer. After preparing the list it was found that the total numbers of banana growers were 250. Out of 250 banana growers, selected 50 banana growers for samples at randomly and prepared a reserve list of 10 banana growers out of this list to use in case of non- availability of sampled growers.

Table 4. Distribution of banana growers constituting the population, sample and reserve list in selected villages under Sonargaon upazila

Sl. No	Name of the villages	Numbers of Growerss		Reserve list
		Population	Sample	
01	Kutubpur	5	1	1
02	South kachpur	5	1	1
03	Mondirpur	40	8	2
04	Majerchar	35	7	2
05	East darikandi	40	8	2
06	Sekherhat	20	4	1
07	Solopara	10	2	-
08	Horispur	10	2	-
09	Goaldi	5	1	-
10	Khasnagor Digirpar	10	2	-
11	Balua Digirpar	10	2	-
12	Tipordi	5	1	-
13	Govindopur	10	2	-
14	Vatropur	10	2	-
15	Sahapur	10	2	-
16	Haria	15	3	1
17	Jauchar	10	2	-
Total		250	50	10

Instrument for Collection of Data:

In a research study, preparation of an interview schedule for collection of information with very careful consideration. Keeping these facts the researcher prepared an interview schedule with utmost care for collecting data from the respondents. Objectives of the study were kept in view while preparing the interview schedule.

The interview schedule continued both open and closed form questions. Scales are developed for computing suitable scores in respect of constraints in the cultivation of banana growers. The rough interview schedule was prepared by administering the same on several banana growers of Sonargaon upazila under Narayangonj district. The pretest was helpful to find out gaps and to locate faulty questions and statements. An alterations and adjustments were made in the schedule on the basis of experience of the pretest. The interview schedule was then cyclostyled in its final form for collection of data.

Collection of Data and Data Processing and Analysis:

The researcher was collected data from the sample growers through interview schedule. Before starting collection of data, the researcher met with the sub assistant agriculture officer of different blocks & Chairman's of different unions in order to explain the objectives of the study and requested them to provide necessary help and cooperation in collection of data. The union parishad members and the local leaders of the area were also approached to render essential help. As a result of all these a good working atmosphere was created in the study area which was very helpful for collection of data by the researcher.

Data for this study were collected from the respondents of 17 villages by using the prepared interview schedule by the researcher himself. Before going to the respondents for interview they were informed earlier, so that they would be available in their respective area. The interviews were held individually in the house or farms of the respective respondent. A grower might feel hesitate in giving some information about matters relating to him. Keeping this in his mind, the researcher explained the purpose of the study as well as established rapport before starting interview with any respondent. Whenever any respondent faced difficulty in understanding any question, the researcher took utmost care to explain the same clearly.

No series problem was faced by the researcher in collecting data. It was not possible to collect from four growers out of the selected 50 sample. They were not available for interview at the time of interviewing. The researcher collected data from the two banana growers using the reserve list. Collection of data took 30 days from the 1st April to 30th April, 2006.

After complete of field survey the collected data will be coded, compiled, tabulated and analysis in accordance with the objectives. Qualitative data are quantified by means of suitable scoring technique and local units are converted into standard units. The statistical measures such as number and percentage distribution are used for describing the variables. The responses of the respondent contained in the interview schedule are transferred to a master sheet in order to entering data in the computer. SPSS computer package is used for processing and analysis of data.

Statement of Hypothesis

According to Goode and Hatt (1952), "A hypothesis is a proposition which can be put to a test to determine its validity. It may seem contrary to or in accord with the commonsense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test." In studying relationships between variables research hypothesis are formulated which state anticipated relationships between the variables. However, for statistical test, it becomes necessary to formulate null hypothesis. A null hypothesis states that there is no relationship between the concerned variables. If a null hypothesis is rejected on the basis of statistical test, it is assumed that there is a relationship between the concerned variables.

The following null hypotheses were formulated to examine the relationships of the selected characteristics of the banana growers with their constraints faced in banana cultivation.

1. There was no relationship between age of the banana growers and their faced constraints.
2. There was no relationship between education of the banana growers and their faced constraints.
3. There was no relationship between family size of the banana growers and their faced constraints.
4. There was no relationship between firm size of the banana growers and their faced constraints.
5. There was no relationship between area under banana cultivation of the banana growers and their faced constraints.
6. There was no relationship between agricultural knowledge of the banana growers and their faced constraints.
7. There was no relationship between annual income of the banana growers and their faced constraints.
8. There was no relationship between social participation of the banana growers and their faced constraints.
9. There was no relationship between extension contact of the banana growers and their faced constraints.

Variables of the Study

In social research, the selection and measurement of variables constitute an important task. In this connection, the researcher looked into the literature to widen his understanding about the nature and scope of the variables involved in the research studies. Ezekiel and Fox (1959) defined a variable as any measurable characteristics which can assume varying or different values in successive individual cases. The hypothesis of a research, while constructed properly, contains at least two important elements, viz. an independent variable and a dependent variable. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationships to an observed phenomenon Townsend (1953). A dependent variable is that factor which appears, disappears or varies as the experimenter introduces, removes or varies the independent variables. The dependent variable is often called the criterion or predicted variable, where as the independent variables is called the treatment, experimental or antecedent variable Dalen (1977).

Selection of Dependent and Independent Variables:

Constraints faced by the banana growers were the main focus of this study and it was considered as the dependent variables. Constraints faced by the banana growers (improved banana sucker, disease, agricultural credit, field management and marketing) were selected dependent variables.

For selection of independent variables the researcher went through the past related literature as far as available. He discussed with the teacher, experts in the relevant fields and research fellows in agricultural extension and related disciplines. He also carefully noticed the various characteristics of the growers of the study. Availability of time, money and other resources were also kept in view in selecting the variables. Characteristics of the banana growers (age, education, knowledge in banana cultivation, area under banana cultivation, annual income, farm size, family size, extension contact and social participation) were selected as independent variables.

Measurement of Variables

Measurement of Independent Variables

It was pertinent to follow a methodological procedure for measuring the selected variables in order to contact the study in accordance with the objectives already formulated. The procedures for measuring the independent variables are described below:

Age:

Age of a respondent was measured in terms of actual years from his birth to the time of interview. A score of one (1) was assigned for each year of age.

Education

Education score was computed for each respondent by giving one point for each year of successful schooling completed. The person who can sign only he was given score 0.5 and who does not reading and writing scored 0.

Family Size:

Family size was operationally measured by assigning a score of one for each member of the family who jointly lived and ate together. The members included are the respondent, his wife, children and other dependent members.

Farm Size:

Farm size was measured for each respondent in terms of hectares by using the following formula:

Farm size= $[A_1 + A_2 + {}^1/_2 (A_3 + A_4) + A_5]$

Where, A_1= homestead area of the respondent (own house)

A_2= Own land under own cultivation

A_3= Area taken on borga system

A_4= Area given to others on borga system

A_5= Area taken from others on lease

Area under Banana Cultivation:

Area covered by banana cultivation in the last season of collecting the data was considered as the area under banana cultivation of a respondent and it measured by hectares.

Annual Income:

Family income of a respondent was measured on the basis of total yearly earning from agriculture and other sources (service, business, daily labor etc.) by the respondent himself and other family members. For calculation of income score, one (1) score was assigned for one thousand taka income.

Agricultural Knowledge:

Agricultural knowledge score of a respondent was measured by asking him 15 questions on different aspect of agricultural knowledge mainly improved variety, IPM, fertilizer management, pests and diseases. The Weights was given for correct answers were 1or 2 or 3 according to the nature of answers and for wrong answer 0. Thus, the agricultural knowledge of the respondents could range from 0 to 30, 0 including no agricultural knowledge and 30 indicating very high agricultural knowledge.

Social Participation:

Social Participation of a respondent was measured according to nature of his participation in different organizations. Score were assigned according to the nature of participation of a respondent in an organization in the following manner.

Nature of participation	Scores
No Participation	0
Ordinary membership	1
Member of the executive committee	2
Officer (president, Secretary and Treasure etc,)	3

Social Participation score of a respondent was obtained by adding the scores for his Participation in all organization on the basis of his responses.

Extension Contact:

The extension contact of a respondent was measured with seven selected extension media as not at all, rarely, occasionally and very often assigning a score of 0, 1, 2 and 3 respectively. Extension contact score of the respondents could range from 0 to 21, here 0 indicating no extension contact and 21 indicating very high extension contact.

Measurement of Dependent Variables:

The dependent variables were measured by constructing scales for each of the five selected aspects. The scales contained 7, 7, 10, 8 and 6 probable problems that the banana growers might face in respect of improved banana sucker, disease, agricultural credit, field management and marketing respectively. Each grower was asked to indicate the extent of difficulty caused by each of the problems by checking any one of the responses such as very high, high, little and not at all and weights assigned to these responses were 3, 2, 1 and 0 respectively. Weights for responses against all these were added together to obtain one's constraints faced score in each of the five aspects. Therefore, the scores of the respondents could range from 0 to 21, 0 to 21, 0 to 30, 0 to 24 and 0 to 18 in the selected aspects such as improved banana sucker, disease, agricultural credit, field management and marketing respectively. So the highest scores of the respondents are 21, 21, 30, 24 and 18 in the selected aspects such as improved banana sucker, disease, agricultural credit, field management and marketing respectively. Therefore, to obtain the individuals problem confrontation score in any aspect, were measured the individuals aspects problem confrontation was expressed in percentage by using the formula reported by Kashem (1977):

Problem confrontation score in any aspect

$$= \frac{\text{Total observed score on any aspect}}{\text{Total possible highest score on that aspect}} \times 100$$

Thus the possible percentage range of problem confrontation score in each of the five selected aspects would be from 0 to 100. An overall problem confrontation score was also computed for each grower by adding his problem confrontation scores of the five aspects and converting it to percentage scores as stated above. So, the overall problem confrontation scores of the range from 0 to 114 and its percentage range from 0 to 100.

Improved Banana Sucker Constraint Score:

In case of improved banana sucker constraint, the respondents contained 7 probable constraints. Therefore, the score of the improved sucker constraints faced could range from 0 to 21 and percentage range from 0 to 100 by using the general procedure as mentioned above, 0 indicating no constraint facing and 100 indicating very high constraint facing.

Disease Constraint Score:

In case of disease constraint, the respondents contained 7 probable constraints. Therefore, the score of the improved sucker constraints faced could range from 0 to 21 and percentage range from 0 to 100 by using the general procedure as mentioned above, 0 indicating no constraint facing and 100 indicating very high constraint facing.

Agricultural Credit Constraint Score:

In case of agricultural credit constraint, the respondents contained 10 probable constraints. Therefore, the score of the improved sucker constraints faced could range from 0 to 30 and percentage range from 0 to 100 by using the general procedure as mentioned above, 0 indicating no constraint facing and 100 indicating very high constraint facing. It may be mentioned here that some banana growers kept aside because they did not take any agricultural credit.

Field Management Constraint Score:

In case of field management constraint, the respondents contained 8 probable constraints. Therefore, the score of the improved sucker constraints faced could range from 0 to 24 and percentage range from 0 to 100 by using the general procedure as mentioned above, 0 indicating no constraint facing and 100 indicating very high constraint facing.

Marketing Constraint Score:

In case of marketing constraint, the respondents contained 6 probable constraints. Therefore, the score of the improved sucker constraints faced could range from 0 to 18 and percentage range from 0 to 100 by using the general procedure as mentioned above, 0 indicating no constraint facing and 100 indicating very high constraint facing.

Overall Constraint Score:

An overall constraint faced score was computed for each grower by adding his problem confrontation scores of the five aspects and converting it to percentage scores as stated above. So, the overall problem confrontation scores of the range from 0 to 114 and its percentage range from 0 to 100.Here, 0 indicating no constraint facing and 100 indicating very high constraint facing. This procedure is shown below:

Name of aspects	Scores range
Improved Sucker Constraint	0 - 100
Disease Constraint	0 - 100
Agricultural Credit Constraint	0 - 100
Field management Constraint	0 - 100
Marketing Constraint Score	0 – 100
Overall Constraint facing	0 - 100

Categorization of the Respondents

For describing the constraint facing of the banana growers, the respondents were classified into three categories, mainly low constraint, medium constraint and high constraint on the basis of their overall constraint facing score.

Categories were also developed in respect of each of the selected characteristics for describing the characteristics of the respondents. Nature of the data and mode of categorization prevailing in the social system guided the researcher in developing categories in respect of the selected characteristics. Procedures for categorization have been discussed while describing the grower's characteristics in chapter IV.

Statistical Treatment

Data collected from the respondents were complied, tabulated and analyzed in accordance with the objectives of the study. The statistical measures used in describing the selected dependent and independent variables were frequency distribution, range, mean, percentage, standard deviation and rank order, tables and bar graphs were used in presenting data for clarification of understanding.

In order to explore the relationships between the constraints of the growers and the selected independent variables, Co-efficient of correlation (r) was measured. Five percent (0.05) level of significance was used as a basis for rejecting any null hypothesis. To find out whether the computed value of 'r' was significantly large to reject null hypothesis, the computed value was compared with the table value of 'r'.

CHAPTER IV

RESULTS AND DISCUSSION

Presented in this chapter are the findings of the study and interpretations of results. This chapter is divided into three sections and presented according to the objectives of the study.

Section I: Constraints of the Growers in Banana Cultivation.

Constraints in banana cultivation faced by the growers are the depended variable of this specific research work. This study refers to the extent of constraints faced by the in five selected aspects of banana cultivation namely, improved banana sucker, disease, agricultural credit, field management and marketing. For having a clear understanding of the overall constraints faced by the growers in banana cultivation, one needs to have an idea about their faced constraints in each of the five selected aspects.

It is also necessary to have an idea about the comparative constraints facing of the growers in the five selected aspects of banana cultivation. Constraints faced by the growers in selected aspects of banana cultivation will be described in the first five sections and the comparative constraints facing of the growers will be described in the sixth section.

a) Constraints in Improved Banana Sucker:

Improved banana sucker constraints facing score were computed to measure the extent of constraints faced by the banana growers in improved banana suckers. The probable percentage scores of the respondents could range from 0 to 100. However, the computed scores of the respondents ranged from 7 to 17 against possible range 0 to 21 with a mean of 12.08 and standard deviation of 2.275. Based on the computed scores, the banana growers were classified into three categories as shown in the following table (5)

Table 5. Classification of the banana growers according to their constraints facing in improved sucker

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	Up to 10	14	28	12.08	2.275
Medium constraints facing	11to 13	19	38		
High constraints facing	Above 13	17	34		
Total		50	100		

Analysis of the data contained in table 5 indicates that the majority 38 percent of the banana growers had medium constraints facing compared to 34 percent having high constraints facing and 28 percent respondents' low constraints facing in improved sucker of banana.

Improved sucker of banana is thought to be the effective bottleneck in getting probable returns. Availability of improved varieties, lack of knowledge and inadequate transport and its higher cost are the major constraints in improved sucker in the study.

b) Constraints in Disease:

Constraints facing score of disease were computed to measure the extent of constraints faced by the banana growers in banana field. The probable percentage scores of the respondents could range from 0 to 100. Zero indicating no constraints faced and 100 indicating very high constraints facing. However, the computed scores of the respondents ranged from 8 to 17 against possible range 0 to 21 with a mean of 13.14 and standard deviation of 2.356. Based on the computed scores, the banana growers were classified into three categories as shown in the following table (6)

Table 6. Classification of the banana growers according to their constraints facing in disease

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	Up to 10	4	8	13.14	2.356
Medium constraints facing	11to 14	34	68		
High constraints facing	Above 14	12	24		
Total		50	100		

Data furnished in above table 6 indicates that the majority 68 percent of the banana growers had medium constraints facing compared to 24 percent having high constraints facing. Only 8 percent respondents low constraints facing in disease of banana.

Disease in banana field is a serious constraint of the growers. In Bangladesh, diseases of banana are Panama and Sigatoga become severe every year and they damage a large portion of the banana yield. Farmers do not have adequate knowledge for how to control the disease caused by insects properly and when the control measures to be taken. They do not have enough financial support to buy sufficient amount of insecticides and sprayers. Therefore, steps should be taken to remove various constraints faced by the farmers in respect of disease.

c) Constraints in Agricultural Credit:

A few numbers of growers did not take any agricultural credit. Rest of growers constraints facing scores in Agricultural credit were computed to measure the extent of constraints faced by the banana growers in banana field. The probable percentage scores of the respondents could range from 0 to 100. Zero indicating no constraints faced and 100 indicating very high constraints facing. However, the computed scores of the respondents among the growers which have taken agricultural credit ranged from 8 to 18 against possible range 0 to 30 with a mean of 10.6 and standard deviation of 5.07. Based on the computed scores, the banana growers were classified into four categories as shown in the following table (7)

Table 7. Classification of the banana growers according to their constraints facing in agricultural credit

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	1 to 10	14	28	10.6	5.07
Medium constraints facing	11to 14	16	32		
High constraints facing	Above14	13	26		
Did not take credit	o	7	14		
Total		50	100		

Data furnished in above table 7 indicates that the majority 32 percent of the banana growers had medium constraints facing compared to 26 percent having high constraints facing, 28 percent respondent's low constraints facing in agricultural credit and 14 percent growers did not take any agricultural credit in cultivation of banana.

In the present study it was revealed that growers faced a wide range of constraints in getting and using credit for banana cultivation. Most of the growers of the study area were marginal or poor. So the growers need necessary credit for this crop. The formalities followed by the bank in giving credit were considered as a hindrance to getting credit. Though a bank does not allow giving credit to the growers in more than one crop, so getting credit from the bank is remarkable constraint for the growers, especially for the marginal growers. More over, growers could not use the credit properly for not getting the credit at the time of need.

d) Constraints in Field Management:

Constraints facing scores in field management were computed to measure the extent of constraints faced by the banana growers in banana field. The probable percentage scores of the respondents could range from 0 to 100. Zero indicating no constraints faced and 100 indicating very high constraints facing. However, the computed scores of the respondents ranged from 5 to 13 against possible range 0 to 24 with a mean of 9.6 and standard deviation of 1.884. Based on the computed scores, the banana growers were classified into three categories as shown in the following table (8)

Table 8. Classification of the banana growers according to their constraints facing in field management

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	Up to 7	7	14	9.6	1.884
Medium constraints facing	8 to 11	35	70		
High constraints facing	Above 11	8	16		
Total		50	100		

Data furnished in above table 8 indicates that the majority 70 percent of the banana growers had medium constraints facing compared to 16 percent having high constraints facing. Only 14 percent respondents low constraints facing in field management of banana. Due to inadequate supply of power pumps, failure to repair the pumps in proper time, high cost of irrigation machineries and diesel, high labour cost, flood and natural calamities etc. are the major constraints in respect of field management. Steps should, therefore, be taken to remove these constraints.

e) Constraints in Marketing:

Constraints facing scores in Marketing were computed to measure the extent of constraints faced by the banana growers in banana field. The probable percentage scores of the respondents could range from 0 to 100. Zero indicating no constraints faced and 100 indicating very high constraints facing. However, the computed scores of the respondents ranged from 4 to 10 against possible range 0 to 18 with a mean of 7.68 and standard deviation of 1.57. Based on the computed scores, the banana growers were classified into three categories as shown in the following table (9)

Table 9. Classification of the banana growers according to their constraints facing in marketing

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	Up to 5	3	6	7.68	1.57
Medium constraints facing	6 to 8	29	58		
High constraints facing	Above 8	18	36		
Total		50	100		

Data furnished in above table 9 indicates that the majority 58 percent of the banana growers had medium constraints facing compared to 36 percent having high constraints facing. Only 6 percent respondents low constraints facing in marketing of banana. Some regulations of marketing eliminated the middlemen and hindrances in marketing this crop. In this study, it was revealed that lack of proper market price, lack of communication and transport facilities, storage management facility etc. growers faced wide range of constraints in banana cultivation. In addition, the growers claimed that the selling price should rise as growing banana needs more money compared to other crops.

Comparative Constraints Facing of Growers in Five Selected Aspects of Banana Cultivation:

Comparative constraints facing of growers in five selected aspects of banana cultivation were investigated in this piece of research. It was considered necessary to have an understanding about the comparative constraints facing of the growers in these different aspects, namely improved banana sucker, disease, agricultural credit, field management and marketing. For purpose, a Constraint Facing Index (CFI) was computed for each of the five aspects by using the following formula as used by Mansur (1989) and Raha (1989).

Constraint Facing Index (CFI) = $P_l \times 1 + P_m \times 2 + P_h \times 3$

Where, P_l = Percentage of growers having low constraint facing

P_m = Percentage of growers having medium constraint facing

P_h = Percentage of growers having high constraint facing

Constraint Facing Index (CFI) for any one of the selected aspects could range from 100 to 300 where 100 indicated low constraint facing, 200 indicated medium constraint facing and 300 indicated high constraint facing. However, Constraint Facing Index for the five selected aspects of banana cultivation ranged from 170 to 230. Comparative pictures of the five selected aspects have been shown in table (10) on the basis of their Constraint Facing Index (CFI).

Table 10. Rank order of five selected aspects of banana cultivation according to their CFI

Aspects of banana cultivation	Constraints facing index (CFI)	Rank order
Marketing	230	1
Disease	216	2
Improved sucker	206	3
Field management	202	4
Agricultural credit	170	5

The CFI in the table 10 indicate's that the growers faced highest constraint in marketing (CFI = 230). This was followed by constraints in disease (CFI=216), improved banana sucker (CFI= 206), field management (CFI= 202) and agricultural credit (CFI= 170).

Extent of constraint facing of the growers in five selected aspects of banana cultivation has been diagrammatically shown in figure no. (1)

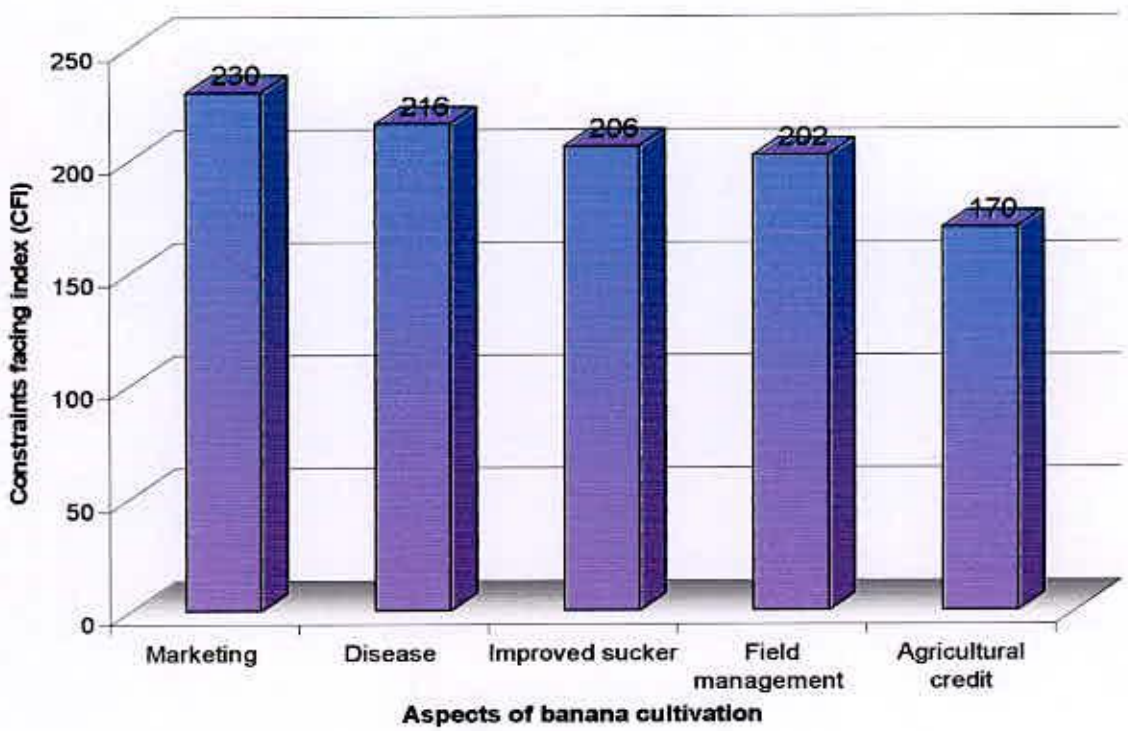

Figure 1. Showing extent of constraint facing of the growers in five selected aspects in banana cultivation

Overall Constraints Facing in Banana Cultivation

The computed overall constraint facing scores of the growers ranged form 27 to 68 against the possible range 0 to 114. The average score was 53.3 and standard deviation was 8.60. Overall constraint facing scores were used to measure the relationships of the constraints faced by the growers in banana cultivation with their selected characteristics by measuring correlation coefficient (r). Based on the overall constraint facing scores, the growers were classified into three categories shown in the following table 11.

Table 11. Classification of growers according to their overall constraints facing in banana cultivation

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	Up to 45	8	16	53.3	8.60
Medium constraints facing	46 to 60	32	64		
High constraints facing	Above 60	10	20		
Total		50	100		

The table 11 indicated that a majority (64 percent) of the growers faced medium constraints in banana cultivation while 20 percent of the growers faced high constraint. Comparatively few growers (16 percent) faced low constraints in banana cultivation.

Distribution of the growers according to their overall constraint facing has been visually presented in fig. No. (2)

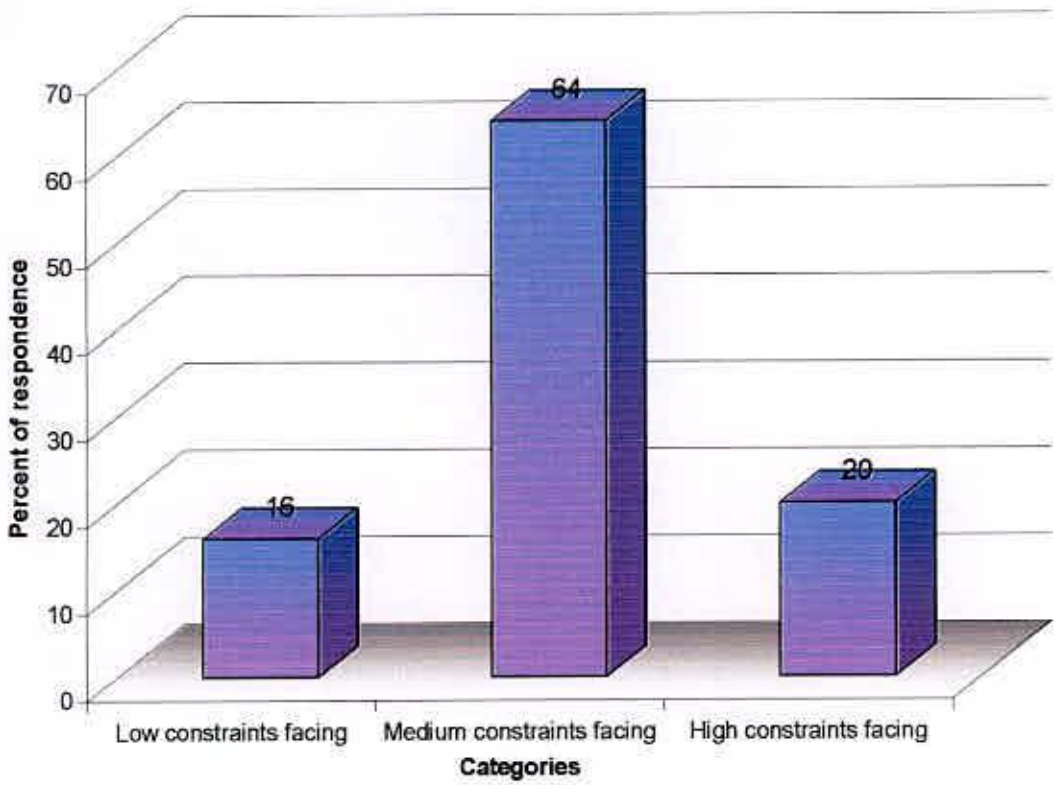

Figure 2. Showing distribution of banana growers according to their overall constraint facing in banana cultivation

It is a common observation that the greater is the constraint faced by an individual in any work, the lesser is his progress in that work. It is, therefore, likely that growers' constraints facing in banana cultivation will have adverse effect in their progress in banana cultivation as well as in agricultural production. The findings of this study indicate that only 16 percent growers face low constraints in banana cultivation. Average of the scores of grower's constraint facing banana cultivation was medium (64 percent). But the highest proportion of the growers (84 percent) faced either medium or high level of constraints. These facts indicate that the desired level of banana production will not be achieved if the different constraints faced by the growers were not by the concerned authority.

Section II: Characteristics of the Growers

Different person's posse's different characteristics. These characteristics of an individual determine his behaviour to a great extent. The selected characteristics of the growers may be broadly divided into three categories. In a single study, however, it is not possible to conduct investigation on all the characteristics included in the above three categories. Therefore, investigation was conducted with some selected characteristics of the growers for exploring the relationships with the constraints in banana cultivation. The selected characteristics were; age, education, family size, knowledge in banana cultivation, farm size, area under banana cultivation, annual income, social participation and extension contact. These nine characteristics of the growers with their relationships to constraints in banana cultivation have been described in this chapter. Data collected from the respondents were compiled, tabulated and analyzed for describing the characteristics.

Table 12. Characteristics profile of the respondents

Sl. No	Characteristics	Measured by	Actual value		Mean value
			Minimum	Maximum	
01	Age	Year	35	85	47.62
02	Education	Scoring	0	15	8.02
03	Family members	Number	4	10	6.44
04	Farm size	Hectare	0.146	9.84	1.32
05	Area under banana cultivation	Hectare	0.0202	0.183	0.048
06	Annual income	Taka In thousand	22.34	1890	222.52
07	Agricultural knowledge	Scoring	10	22	17.1
08	Social participation	Scoring	0	10	2.14
09	Extension contact	Scoring	4	14	9.06

Age

Age of the respondents varied from 35 to 85 years, the average being 47.62 years with standard deviation of 10.50. The respondents were classified into three categories on the basis of their age.

Table 13. Classification of the growers according to their age

Categories	Age in Years	Banana growers		Mean	Standard deviation
		Number	Percent		
Young	Up to 40	15	30	47.62	10.50
Middle-aged	41 to 55	28	56		
Old	Above 55	7	14		
Total		50	100		

Data furnished in table 13 indicate that 30 percent of the respondents were young as compared to 56 percent being middle aged and only 14 percent being old. Decision regarding the farming practices in the study area is, therefore, expected to be considerably influenced by the middle aged growers.

Education

The level of education of the respondents ranged from 0-15. Here, the average educational score was 8.02 with a standard deviation of 4.02. On the basis of, their education, the growers were classified into four categories shown in table (14)

Table 14. Classification of the growers according to their education

Categories	Level of Education	Banana growers		Mean	Standard deviation
		Number	Percent		
No education	Unable to read and write	6	12	8.02	4.02
Primary education	Class I to V	8	16		
Secondary education	Class VI to X	16	32		
Above secondary education	Above class X	20	40		
Total		50	100		

Data presented in the table 14 indicate that 12 percent the growers were illiterate, 16 percent growers were primary educated, 32 percent growers were Secondary educated and 40 percent were above Secondary educated.

Education helps the growers to obtain useful information about improved varieties and practices in agriculture, especially banana cultivation through reading leaflets, booklets, books and other printed materials in this case. The findings of this study, however, indicate that 12 percent of the growers had schooling, who is supposed to face a great difficulty in adopting improved practices of banana cultivation. Such consideration indicates the need for improving literacy level among the growers for enhancing adoption of improved practices in banana cultivation.

Family Size

Family size of the respondents ranged from 4 to 10 numbers with a mean of 6.44 and standard deviation of 1.39.On the basis of their family size, the growers were classified into three categories as shown in table 15.

Table 15. Classification of growers according to their family size

Categories	Family size (Numbers)	Banana growers		Mean	Standard deviation
		Number	Percent		
Small Family	2 to 4	1	2	6.44	1.39
Medium Family	5 to 7	36	72		
Large Family	Above 7	13	26		
Total		50	100		

The table 15 reveals that a large proportion of banana growers (72 percent) belonged to the medium, nearly 26 percent growers were large family and only 2 percent growers were small family. Banana cultivation is labour intensive and time consuming. The findings indicate that more than 98 percent of the growers having medium to large family size. It is likely that large families will have adequate family labour to meet labour requirement for banana cultivation.

Farm Size

Farm size of the respondents ranged from 0.146 hectare 9.84 hectare with a mean of 1.32 and standard deviation of 1.49. On the basis of their farm size, the growers were classified into three categories as shown in table 16.

Table 16. Classification of growers according to their farm size

Categories	Farm size in (ha)	Banana growers		Mean	Standard deviation
		Number	Percent		
Small farm	Below 1.0	23	46	1.32	1.49
Medium farm	1 to 2	24	48		
Large farm	Above 2	3	6		
Total		50	100		

Data presented in the table 16 show that highest proportion (48 percent) of the growers had medium farm compared to 46 percent having small farm and only 6 percent had large farm. The findings indicate that 54 percent of the banana growers had medium to large farm size. In order to have a reasonable standard of living and increasing banana production, the growers must adopt improved practices which could be followed by the fellow growers and it can be achieved with the help of developing knowledge and skill of the banana growers.

Area under Banana Cultivation:

Area under banana cultivation scores of the respondents varied from 0.0202 to 0.183 hectares with a mean of 0.048 and standard deviation of 0.03008. On the basis of the area under banana cultivation the growers were classified into the following categories.

Table 17. Classification of growers according to their area under banana cultivation

Categories	Area in (ha)	Banana growers		Mean	Standard deviation
		Number	Percent		
Small area	Up to 0.0405	34	68	0.048	0.03008
Medium area	0.0406 to 0.0810	13	26		
Large area	Above 0.0810	3	6		
Total		50	100		

Data shown in the table 17 revealed that most of the growers (68 percent) allotted small area for banana cultivation followed by medium area (26 percent) and big area (only 6 percent).

Annual Income

Annual income of the growers ranged form 22340 to 1890000 taka. The mean was 222520 taka and standard deviation was 309.905. On the basis of annual income, the respondents were categorized into three groups as shown in table 18.

Table 18. Classification of banana growers according to their annual income

Categories	Annual income (taka in thousand)	Banana growers		Mean	Standard deviation
		Number	Percent		
Low income	Up to 120	16	32	222.52	309.905
Medium income	121 to 250	27	54		
High income	Above 250	7	14		
Total		50	100		

Data presented in a table 18 that the highest proportion (54 percent) of the respondents had medium income that was followed by low (32 percent) and high (14 percent) income earners. Generally higher income gives an individual better status in the society.

Agricultural Knowledge of Banana Cultivation:

Computed scores of the Growers about agricultural knowledge ranged from 10 to 22 with a mean of 17.1 and standard deviation of 2.5892. On the basis of agricultural knowledge of the respondents were classified into three categories as follows in table 19:

Table 19. Classification of banana growers according to their agricultural knowledge of banana cultivation

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Poor knowledge	0 to 15	12	24	17.1	2.5892
Moderate knowledge	16 to 20	32	64		
High knowledge	Above 20	6	12		
Total		50	100		

Data contained in table 19 show that most of growers (64 percent) had a moderate knowledge to poor knowledge (24 percent) in banana cultivation as compared (only 12 percent) having high knowledge respectively.

One may apprehend that banana cultivation will suffer badly if effective steps are not taken to improve the knowledge and skill of the growers in different aspects of banana cultivation.

Social Participation

The social participation scores of the respondents ranged from 0 to 10. The average score was 2.14 with a standard deviation of 2.2769; the respondents were classified into the following four categories as shown in table 20.

Table 20. Classification of the banana growers according to their social participation

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
No participation	0	7	14	2.14	2.2769
Low participation	1 to 2	33	66		
Medium participation	3 to 5	4	8		
High participation	Above 5	6	12		
Total		50	100		

Data presented in table 20 indicate that most of the growers (66 percent) of the respondents had low participation against 14 percent of the respondents who did not participate in any social organization, 8 percent had medium and 12 percent had high participation in social organizations.

Participation in different organization helps to know his position better. It also helps him to know the improved practices and other new ideas relating to different agricultural aspects. Social participation may, therefore, enable the growers to cope with their constraints in banana cultivation effectively. The findings of this study indicate that a large proportion (66 percent) of the growers had low participation in organization and 14 percent had no participation at all.

Extension Contact

Computed extension contact ranged from 4 to 14with an average of 9.06 and standard deviation of 2.3596. Based on the extension contact scores, the respondents were classified into the three categories shown in table (21)

Table 21. Classification of the banana growers according to their extension contact

Categories	Scores	Banana growers		Mean	Standard deviation
		Number	Percent		
Low extension contact	Up to 7	12	24	9.06	2.3596
Medium extension contact	8 to 10	27	54		
High extension contact	Above 10	11	22		
Total		50	100		

Data presented in table 21 indicate the highest proportion (54) of the growers had medium extension contact followed by low extension contact (24 percent) and high extension contact (22 percent).

Frequent and timely extension contact increase growers knowledge, skills and abilities regarding various aspects of crop production. But the findings indicates that almost one fourth (24 percent) of the respondents had low extension contact. It is necessary to find out the reasons for such low extension contact so that steps might be taken to improve the situation.

Section III: Relationship of the Selected Characteristics of the Growers with their Constraints Facing in Banana Cultivation

Co-efficient of correlation was computed in order to explore the relationship between the selected characteristics of the banana growers and their constraints facing. As a rough and ready guide to the meaning of '(r)' the table (22) offers a descriptive interpretation.

Table 22. The values of '(r)' and their corresponding meaning

'(r)' value	Meaning
0.00 to 0.19	a very low correlation
0.20 to 0.39	a low correlation
0.40 to 0.69	a moderate correlation
0.70 to 0.89	a high correlation
0.90 to 0.00	a very high correlation

Source: Choen and Holliday, 1982

The computed values of Co-efficient of correlation '(r)' showing the relationship of nine characteristics of the growers with their faced constraints in banana cultivation have been presented table (23)

Table 23. Results of the correlation analysis between the selected characteristics (independent variables) of the growers and their faced constraints in banana cultivation (dependent variables)

Selected characteristics (Independent variables)	Faced constraints (Dependent variable and computed value of 'r')					
	Improved sucker	Disease	Agri-cultural credit	Field manage ment	Marketing	Overall
Age	-0.024^{NS}	-0.064^{NS}	-0.165^{NS}	-0.183^{NS}	-0.029^{NS}	-0.166^{NS}
Education	-0.277*	-0.286*	-0.095^{NS}	0.176^{NS}	-0.304*	-0.287*
Family size	0.0016^{NS}	-0.019^{NS}	-0.164^{NS}	0.162^{NS}	0.085^{NS}	-0.051^{NS}
Farm size	-0.379**	-0.317*	-0.453***	-0.201^{NS}	-0.334*	-0.559***
Area under banana cultivation	-0.064^{NS}	-0.066^{NS}	0.267^{NS}	0.172^{NS}	-0.308*	0.104^{NS}
Annual income	-0.398**	-0.283*	-0.565***	-0.124^{NS}	-0.349*	-0.606***
Agricultural knowledge of banana cultivation	-0.213^{NS}	-0.276*	-0.181^{NS}	0.117^{NS}	-0.318*	-0.324*
Social participation	-0.376**	-0.293*	-0.286*	-0.134^{NS}	-0.227^{NS}	-0.419**
Extension contact	-0.046^{NS}	0.039^{NS}	0.040^{NS}	0.423**	-0.276*	0.312*

Level	Table value '(r)' with (50-2)=48 degrees of freedom
0.05 Level	0.2732
0.01 Level	0.3541
0.001 Level	0.4433

*= Significant at 0.05 level of probability

**= Significant at 0.01 level of probability

***= Significant at 0.001 level of probability

NS= Not significant

A) Relationship between Age of the Growers and their Constraints Facing in Banana Cultivation

The relationship between age of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between age of the growers and their faced constraints in banana cultivation"

1) Relationship between Age of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between age of the growers and constraints of improved banana sucker in banana cultivation was found to be -0.024 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.024) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was not significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between age of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Age of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between age of the growers and constraints of disease in banana cultivation was found to be -0.064 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.064) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was not significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between age of the growers and constraints of disease in banana cultivation.

3) Relationship between Age of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between age of the growers and constraints of agricultural credit in banana cultivation was found to be -0.165 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.165) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was not significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between age of the growers and constraints of agricultural credit in banana cultivation.

4) Relationship between Age of the Growers and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between age of the growers and constraints of field management in banana cultivation was found to be -0.183 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.183) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the concerned variables were independent i.e. age of the growers had no significant relationship with their faced constraints field management in banana cultivation.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between age of the growers and constraints of field management in banana cultivation.

5) Relationship between Age of the Growers and Constraints of Marketing in Banana Cultivation

Computed value of the coefficient of correlation between age of the growers and constraints of marketing in banana cultivation was found to be -0.029 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.029) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the concerned variables were independent i.e. age of the growers had no significant relationship with their faced constraints of marketing in banana cultivation.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between age of the growers and constraints of marketing in banana cultivation.

6) Relationship between Age of the Growers and Overall Constraints in Banana Cultivation

Computed value of the coefficient of correlation between age of the growers and overall constraints in banana cultivation was found to be -0.166 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.166) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was not significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between age of the growers and overall constraints in banana cultivation

B) Relationship between Education of the Growers and their Constraints Facing in Banana Cultivation

The relationship between education of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between education of the growers and their faced constraints in banana cultivation"

1) Relationship between Education of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between education of the growers and constraints of improved banana sucker in banana cultivation was found to be -0.277 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.277) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between education of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Education of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between education of the growers and constraints of disease in banana cultivation was found to be -0.286 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.286) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between education of the growers and constraints of disease in banana cultivation.

3) Relationship between Education of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between education of the growers and constraints of agricultural credit in banana cultivation was found to be -0.095 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.095) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between education of the growers and constraints of agricultural credit in banana cultivation.

4) Relationship between Education of the Growers and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between education of the growers and constraints of field management in banana cultivation was found to be 0.176 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.176) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between education of the growers and constraints of field management in banana cultivation.

5) Relationship between Education of the Growers and Constraints of Marketing in Banana Cultivation

Computed value of the coefficient of correlation between education of the growers and constraints of marketing in banana cultivation was found to be -0.304 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.304) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between education of the growers and constraints of marketing in banana cultivation.

6) Relationship between Education of the Growers and Overall Constraints in Banana Cultivation

Computed value of the coefficient of correlation between education of the growers and overall constraints in banana cultivation was found to be -0.287 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.287) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between education of the growers and overall constraints in banana cultivation.

C) Relationship between Family Size of the Growers and their Constraints Facing in Banana Cultivation

The relationship between family size of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between family size of the growers and their faced constraints in banana cultivation"

1) Relationship between Family Size of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between family size of the growers and constraints of improved banana sucker in banana cultivation was found to be 0.0016 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.0016) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between family size of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Family Size of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between family size of the growers and constraints of disease in banana cultivation was found to be -0.019 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.019) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between family size of the growers and constraints of disease in banana cultivation.

3) Relationship between Family Size of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between family size of the growers and constraints of agricultural credit in banana cultivation was found to be -0.164 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.164) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between family size of the growers and constraints of agricultural credit in banana cultivation.

4) Relationship between Family Size of the Growers and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between family size of the growers and constraints of field management in banana cultivation was found to be 0.162 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.162) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between family size of the growers and constraints of field management in banana cultivation.

5) **Relationship between Family Size of the Growers and Constraints of Marketing in Banana Cultivation**

Computed value of the coefficient of correlation between family size of the growers and constraints of marketing in banana cultivation was found to be -0.085 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.085) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between family size of the growers and constraints of marketing in banana cultivation.

6) **Relationship between Family Size of the Growers and Overall Constraints in Banana Cultivation**

Computed value of the coefficient of correlation between family size of the growers and overall constraints in banana cultivation was found to be -0.051 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.051) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between family size of the growers and overall constraints in banana cultivation.

D) Relationship between Farm Size of the Growers and their Constraints Facing in Banana Cultivation

The relationship between farm size of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between farm size of the growers and their faced constraints in banana cultivation"

1) Relationship between Farm Size of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between farm size of the growers and constraints of improved banana sucker in banana cultivation was found to be -0.379 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.379) was found to be larger than the table value ('r'=0.3541) with 48 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between farm size of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Farm Size of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between farm size of the growers and constraints of disease in banana cultivation was found to be -0.317 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.317) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between farm size of the growers and constraints of disease in banana cultivation.

3) Relationship between Farm Size of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between farm size of the growers and constraints of agricultural credit in banana cultivation was found to be -0.453 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was modest. Thirdly, the computed value of 'r' ('r'= -0.453) was found to be larger than the table value ('r'=0.4433) with 48 degrees of freedom at 0.001 level of probability. Thus, statistically the relationship was significant at 0.001 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between farm size of the growers and constraints of agricultural credit in banana cultivation.

4) Relationship between Farm Size of the Growers and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between farm size of the growers and constraints of field management in banana cultivation was found to be -0.201 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.201) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between farm size of the growers and constraints of field management in banana cultivation.

5) Relationship between Farm Size of the Growers and Constraints of Marketing in Banana Cultivation

Computed value of the coefficient of correlation between farm size of the growers and constraints of marketing in banana cultivation was found to be -0.334 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.334) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between farm size of the growers and constraints of marketing in banana cultivation.

6) Relationship between Farm Size of the Growers and Overall Constraints in Banana Cultivation

Computed value of the coefficient of correlation between farm size of the growers and overall constraints in banana cultivation was found to be -0.559 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was modest. Thirdly, the computed value of 'r' ('r'= -0.559) was found to be larger than the table value ('r'=0.4433) with 48 degrees of freedom at 0.001 level of probability. Thus, statistically the relationship was significant at 0.001 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between farm size of the growers and overall constraints in banana cultivation.

E) Relationship between Area under Banana Cultivation and their Constraints Facing in Banana Cultivation

The relationship between area under banana cultivation and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between area under banana cultivation and their faced constraints in banana cultivation"

1) Relationship between Area under Banana Cultivation and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between area under banana cultivation and constraints of improved banana sucker in banana cultivation was found to be -0.064 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.064) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between area under banana cultivation and constraints of improved banana sucker in banana cultivation.

2) Relationship between Area under Banana Cultivation and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between area under banana cultivation and constraints of disease in banana cultivation was found to be -0.066 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.066) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between area under banana cultivation and constraints of disease in banana cultivation.

3) Relationship between Area under Banana Cultivation and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between area under banana cultivation and constraints of agricultural credit in banana cultivation was found to be 0.267 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= 0.267) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between area under banana cultivation and constraints of agricultural credit in banana cultivation.

4) Relationship between Area under Banana Cultivation and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between area under banana cultivation and constraints of field management in banana cultivation was found to be 0.172 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.172) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between area under banana cultivation and constraints of field management in banana cultivation.

5) Relationship between Area under Banana Cultivation and Constraints of Marketing in Banana Cultivation

Computed value of the coefficient of correlation between area under banana cultivation and constraints of marketing in banana cultivation was found to be -0.308 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.308) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant relationship between area under banana cultivation and constraints of marketing in banana cultivation.

6) Relationship between Area under Banana Cultivation and Overall Constraints in Banana Cultivation

Computed value of the coefficient of correlation between area under banana cultivation and overall constraints in banana cultivation was found to be 0.104 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.104) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between area under banana cultivation and overall constraints in banana cultivation.

F) Relationship between Annual Income of the Growers and their Constraints Facing in Banana Cultivation

The relationship between annual income of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between annual income of the growers and their faced constraints in banana cultivation"

1) Relationship between Annual Income of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between annual income of the growers and constraints of improved banana sucker in banana cultivation was found to be -0.398 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.398) was found to be larger than the table value ('r'=0.3541) with 48 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between annual income of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Annual Income of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between annual income of the growers and constraints of disease in banana cultivation was found to be -0.283 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.283) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between annual income of the growers and constraints of disease in banana cultivation.

3) Relationship between Annual Income of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between annual income of the growers and constraints of agricultural credit in banana cultivation was found to be -0.565 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was modest. Thirdly, the computed value of 'r' ('r'= -0.565) was found to be larger than the table value ('r'=0.4433) with 48 degrees of freedom at 0.001 level of probability. Thus, statistically the relationship was significant at 0.001 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between annual income and constraints of agricultural credit in banana cultivation.

4) Relationship between Annual Income of the Growers and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between annual income of the growers and constraints of field management in banana cultivation was found to be -0.124 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.124) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between annual income of the growers and constraints of field management in banana cultivation.

5) Relationship between Annual Income of the Growers and Constraints of Marketing in Banana Cultivation

Computed value of the coefficient of correlation between annual income of the grower's banana cultivation and constraints of marketing in banana cultivation was found to be -0.349 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.349) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between annual income of the growers and constraints of marketing in banana cultivation.

6) Relationship between Annual Income of the Growers and Overall Constraints in Banana Cultivation

Computed value of the coefficient of correlation between annual income of the growers and overall constraints in banana cultivation was found to be -0.606 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was modest. Thirdly, the computed value of 'r' ('r'= -0.606) was found to be larger than the table value ('r'=0.4433) with 48 degrees of freedom at 0.001 level of probability. Thus, statistically the relationship was significant at 0.001 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between annual income of the growers and overall constraints in banana cultivation.

G) Relationship between Agricultural Knowledge of the Growers and their Constraints Facing in Banana Cultivation

The relationship between agricultural knowledge of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between agricultural knowledge of the growers and their faced constraints in banana cultivation"

1) Relationship between Agricultural Knowledge of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between agricultural knowledge of the growers and constraints of improved banana sucker in banana cultivation was found to be -0.213 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.213) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant at 0.05 level.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between agricultural knowledge of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Agricultural Knowledge of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between agricultural knowledge of the growers and constraints of disease in banana cultivation was found to be -0.276 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.276) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between agricultural knowledge of the growers and constraints of disease in banana cultivation.

3) Relationship between Agricultural Knowledge of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between agricultural knowledge of the growers and constraints of agricultural credit in banana cultivation was found to be -0.181 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.181) was found to be smaller than the table value ('r'=0.4433) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant at 0.05 level.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between agricultural knowledge and constraints of agricultural credit in banana cultivation.

4) Relationship between Agricultural Knowledge of the Growers and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between agricultural knowledge of the growers and constraints of field management in banana cultivation was found to be 0.117as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.117) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between agricultural knowledge of the growers and constraints of field management in banana cultivation.

5) Relationship between Agricultural Knowledge of the Growers and Constraints of Marketing in Banana Cultivation

Computed value of the coefficient of correlation between agricultural knowledge of the grower's banana cultivation and constraints of marketing in banana cultivation was found to be -0.318 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.318) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between agricultural knowledge of the growers and constraints of marketing in banana cultivation.

6) Relationship between Agricultural Knowledge of the Growers and Overall Constraints in Banana Cultivation

Computed value of the coefficient of correlation between agricultural knowledge of the growers and overall constraints in banana cultivation was found to be -0.324 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.324) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between agricultural knowledge of the growers and overall constraints in banana cultivation.

H) Relationship between Social Participation of the Growers and their Constraints Facing in Banana Cultivation

The relationship between social participation of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between social participation of the growers and their faced constraints in banana cultivation"

1) Relationship between Social Participation of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between social participation of the growers and constraints of improved banana sucker in banana cultivation was found to be -0.376 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.376) was found to be larger than the table value ('r'=0.3541) with 48 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between social participation of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Social Participation of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between social participation of the growers and constraints of disease in banana cultivation was found to be -0.293 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.293) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between social participation of the growers and constraints of disease in banana cultivation.

3) Relationship between Social Participation of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between social participation of the growers and constraints of agricultural credit in banana cultivation was found to be -0.286 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.286) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between social participation and constraints of agricultural credit in banana cultivation.

4) Relationship between Social Participation of the Growers and Constraints of Field Management In Banana Cultivation

Computed value of the coefficient of correlation between social participation of the growers and constraints of field management in banana cultivation was found to be -0.134 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.134) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between social participation of the growers and constraints of field management in banana cultivation.

5) Relationship between Social Participation of the Growers and Constraints of Marketing in Banana Cultivation

Computed value of the coefficient of correlation between social participation of the grower's banana cultivation and constraints of marketing in banana cultivation was found to be -0.227 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.227) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant at 0.05 level.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between social participation of the growers and constraints of marketing in banana cultivation.

6) Relationship between Social Participation of the Growers and Overall Constraints in Banana Cultivation

Computed value of the coefficient of correlation between social participation of the growers and overall constraints in banana cultivation was found to be -0.419 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was modest. Thirdly, the computed value of 'r' ('r'= -0.419) was found to be larger than the table value ('r'=0.3541) with 48 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between social participation of the growers and overall constraints in banana cultivation.

1) Relationship between Extension Contact of the Growers and their Faced Constraints in Banana Cultivation

The relationship between extension contact of the growers and their faced constraints (e.g. improved banana sucker, Disease, Agricultural credit, Field management and Marketing) in banana cultivation was examined by using following null hypothesis "There is no relationship between extension contact of the growers and their faced constraints in banana cultivation"

1) Relationship between Extension Contact of the Growers and Constraints of Improved Banana Sucker in Banana Cultivation

Computed value of the coefficient of correlation between extension contact of the growers and constraints of improved banana sucker in banana cultivation was found to be -0.046 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= -0.046) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant at 0.05 level.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between extension contact of the growers and constraints of improved banana sucker in banana cultivation.

2) Relationship between Extension Contact of the Growers and Constraints of Disease in Banana Cultivation

Computed value of the coefficient of correlation between extension contact of the growers and constraints of disease in banana cultivation was found to be 0.039 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.039) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant at 0.05 level.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between extension contact of the growers and constraints of disease in banana cultivation.

3) Relationship between Extension Contact of the Growers and Constraints of Agricultural Credit in Banana Cultivation

Computed value of the coefficient of correlation between extension contact of the growers and constraints of agricultural credit in banana cultivation was found to be 0.40 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was very low. Thirdly, the computed value of 'r' ('r'= 0.040) was found to be smaller than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was no significant at 0.05 level.

Based on the above findings, the null hypothesis could not be rejected and hence, the investigator concluded that there was no significant relationship between extension contact and constraints of agricultural credit in banana cultivation.

4) Relationship between Extension Contact of the Growers and Constraints of Field Management in Banana Cultivation

Computed value of the coefficient of correlation between extension contact of the growers and constraints of field management in banana cultivation was found to be 0.423 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was modest. Thirdly, the computed value of 'r' ('r'= 0.423) was found to be larger than the table value ('r'=0.3541) with 48 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant positive relationship between extension contact of the growers and constraints of field management in banana cultivation.

5) **Relationship between Extension Contact of the Growers and Constraints of Marketing in Banana Cultivation**

Computed value of the coefficient of correlation between extension contact of the grower's banana cultivation and constraints of marketing in banana cultivation was found to be -0.276 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a negative relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= -0.276) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between extension contact of the growers and constraints of marketing in banana cultivation.

6) **Relationship between Extension Contact of the Growers and Overall Constraints in Banana Cultivation**

Computed value of the coefficient of correlation between extension contact of the growers and overall constraints in banana cultivation was found to be 0.312 as shown in table 23. The following observation on the basis computed value 'r'

Firstly, a positive relationship was found to exist between the variables. Secondly, the relationship was low. Thirdly, the computed value of 'r' ('r'= 0.312) was found to be larger than the table value ('r'=0.2732) with 48 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was significant at 0.05 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant positive relationship between extension contact of the growers and overall constraints in banana cultivation.

CHAPTER V

Summary, Conclusion and Recommendations

Summary

Introduction

Traditionally and predominantly Bangladesh is an Agricultural country. About 84.5% of her population is rural based and directly or indirectly depend on agriculture (BBS 1998). Agriculture still remains the largest sector of the economy in Bangladesh, which contributes about 21.77% gross domestic product in the economy of Bangladesh (BBS 2005).

Bangladesh has a very rich alluvial soil and moderate climate congenial to the growth of various crops and fruits (i.e. Rice, Wheat, Jute, Maize, Banana, Papaya, Mango, Jackfruit etc) throughout the year. But constraints in agriculture are multifaced. The cause may be due to the fact that the agriculture as a whole remains to be traditional with its century old cultural practices and local crop varieties. That is why per unit yield of the major crops is one of the lowest in the world. Realizing the situation the Government has taken up various steps to improve the situation. Now a days, Governments and Non-government sectors like, NGOs are trying to produce more fruit crops under the tree plantation

The Banana (*Musa spp*) is one important tropical fruit. Banana occupies an important position among the fruits of Bangladesh not only for its highest production among the fruits but also for its increasing popularity among the farmers as an economic crop. According to production, banana is the first in Bangladesh and second according to cultivated land.

There were more than 40 varieties available in Bangladesh. But a particular variety is known by more than one name in different places and the actual number may be around 32. The important banana varieties grown in Bangladesh are Amritasagor, Sabri, Champa, Kabari, Japkathli, Ganasundari etc.

Inspire of greater potentiality of banana cultivation, the growers of Bangladesh are not free from problems in cultivating banana. Therefore, constraints in the scientific cultivation of banana as perceived by the growers might be influenced by their personal, economic, social and essential to have an understanding of the banana cultivation constraints faced by the growers and its relationship with their various characteristics for effective planning and execution of increasing banana cultivation in Bangladesh.

Therefore, the purpose of the study was to have an understanding of the problems faced by the banana growers of selected Sonargaon upazila under Narayangonj district. It was anticipated that such a study would discover the causes of the problems related to cultivation, marketing, processing and storing of banana as well as help in planting an effective measure for banana production all over the country

Specific Objectives

The following specific objectives were formulated for giving proper direction of the study.

1. To determine the extent of constraints faced by the growers in cultivation of banana on following aspects-
    a) Improved banana sucker
    b) Disease
    c) Agricultural credit
    d) Field management
    e) Marketing

2. To determine and describe the selected characteristics of the growers.
    i) Age
    ii) Education
    iii)Family size
    iv) Farm size
    v) Area under Banana cultivation
    vi) Knowledge in Banana cultivation
    vii) Annual income
    viii) Social Participation
    ix) Extension contact

3. To explore the relationship between the constraints faced by the growers in banana cultivation and their selected characteristics.

Scope and Limitations of this Study

The study was undertaken with a view to have an understanding of the constraints faced by the growers in banana production. In order to conduct the research in a meaningful and manageable way it becomes necessary to impose some limitation in regard to certain aspects of the study. Considering the limitation of time, money and other resources of the researcher, the following limitations have been observed throughout the study.

1) The study was confined to Sonargaon upazila under Narayangonj district.
2) The study was limited to the banana growers and relevant data were collected from sample of the population of the study.
3) There were various aspects in banana cultivation and many sorts of constraints connected with this issue. It was not possible for the researcher to include all aspects of banana production constraints in a single study. In this study the researcher studied the constraints faced by banana growers in respect of five dimensions, namely, improved banana sucker, diseases, field management, credit and marketing.
4) Relationship of the constraints in banana cultivation could be studied with the various characteristics of the growers, but only 9 characteristics of the growers were selected for investigation in this study.

The findings of this study will be particularly applicable to Sonargaon Upazila under Narayangonj District. They might, however, have general applicability to other areas of the country, where the physical socio-economic and cultural conditions are mostly similar with those of the study area. The findings are hence, expected to be useful to the planners to formulate plans and procedures for the improvement of banana cultivation. The administrators, supervisors field workers and others who are to work in the field of banana may find this study valuable and informative.

Hardly any research has yet been conducted for studying the constraints faced by the growers in banana cultivation particularly in Bangladesh. Findings of this study may, therefore, add to the body of knowledge in this much needed area of banana cultivation.

Assumptions

The followings kept in mind while conducting the study:

An assumption is the supposition that an apparent fact or principle is true in the light of the available evidence (Goode, 1954). The researcher had the following assumption in mind while undertaking this study.

1. The respondents selected for this study were competent to satisfy the queries designed by the investigator.
2. The researcher who acted as interviewer was well adjusted to the social environment of the study area. Hence the data collected by him from the respondents were free from bias.
3. The views and opinions furnished by the banana growers included in the sample were the representative views and opinions of all the banana growers of the study area.
4. The researcher who acted as interviewer was well adjusted to the social and cultural environment of the study area. Hence, the respondents furnished their correct opinions without hesitation.

Statement of Hypothesis

The null hypothesis formulated to test the relationships of the nine selected characteristics of the banana growers with their constraints facing in respect of banana cultivation where as follows:

There are no relationships between the selected characteristics of the banana growers and their constraints faced in banana cultivation.

Methodology

Only the banana growers who are directly involved with banana cultivation of seventeen villages of seven unions namely, Aminpur pourosova, Baider Bazar, Kachpur, Jampur, kachpur, Mugrapara and pirujpur union of Sonargaon upazila under Narayangonj district constituted the population of the study. Thus 250 banana growers were the population of the study. Data were however, collected from a sample to 20 percent of the total population i.e. 50 growers selected by random sampling method.

The researcher himself collected the data by interview procedure. An interview schedule was prepared in Bengali to collect the required data for this study. Simple questions and statement as well as some scales were included in the schedule. The interviews were held individually in the houses or farms of the respondents. Data collected from the growers facing constraints in banana cultivation in five selected aspects was the dependent variable of this study. Independent variables included nine characteristics of the growers, namely, age education, family size, farm size annual income, banana cultivation area, agricultural knowledge, social participation and extension contact. For both dependent and independent variables, qualitative data were converted to quantitative data by means of suitable scoring whenever necessary. Suitable categories were developed in respect of constraints faced by the growers in banana cultivation and each of the selected characteristics. These categories were used for analysis in accordance with the objectives of the study. Such statistical measures as number and percentage distribution, range, average, and rank order were used in describing constraints faced by the growers in five characteristics of the growers. Correlation test was used to examine the relationships between characteristics of the banana growers with their constraints faced in the five aspects of cultivating banana. Five percent (0.05) level of probability was used throughout the study as the basis for rejection of any null hypothesis.

Summary of the Study

Constraints Faced by the Growers in Banana Cultivation

Findings in respect of constraints faced by the growers in each of the five aspects of banana cultivation, comparative constraints facing among the five selected aspects of banana cultivation and growers' overall constraints in banana cultivation are summarized below.

Constraints in Improved Banana Sucker:

The majority (38 percent) of the growers faced medium constraint in respect of improved sucker, compared to 34 percent faced high constraints and 28 percent faced low constraints in improved banana sucker.

Constraints in Diseases Infestation:

The majority (68 percent) of the growers faced medium constraint in respect of diseases, compared to 24 percent faced high constraints and 8 percent faced low constraints in respect of diseases.

Constraints in Credit:

The majority (32 percent) of the growers faced medium constraint in respect of credit, compared to 28 percent faced low constraints, 26 percent faced low constraints in respect of diseases and 14 percent did not take any credit.

Constraints in Field Management:

More than half (70 percent) of the growers faced medium constraints in respect of field management constraints, compared to 16 percent faced high constraints and only 14 percent faced low constraints.

Constraints in Marketing:

Constraints facing in marketing had shown that more than half (58 percent) of the growers faced medium constraints in the respect of marketing while 36 percent faced high constraints and only 6 percent faced low constraints.

Comparative Constraints Facing in Five Selected aspects of Banana Cultivation

In order to compare the constraints faced by the growers in five selected aspects of banana cultivation, a constraint facing index (CFI) was computed for each aspects. Constraint facing index of the five selected aspects ranged from 170 to 230 against the possible range of 100 to 300. Growers faced highest constraints in marketing as indicated by its CFI of 230; CFI of disease, improved banana sucker, field management and agricultural credit were 216, 206, 202 and 170 respectively

Overall Constraints in Banana Cultivation:

For having an understanding of the comprehensive constraints of the growers in the five selected aspects of banana cultivation, an overall constraint facing score was computed for each respondent by adding and then converting to percentage of the scores in the five selected aspects of banana cultivation. A good majority (64 percent) of the growers had medium constraints while 20 percent of the growers faced high constraints and 16 percent faced low constraints in banana cultivation.

Characteristics of the Growers

Nine characteristics of the growers were selected for exploring their relationships with faced by the growers banana cultivation. Findings in respect of the selected characteristics are summarized below:

Age

Age of growers ranged from 35 to 85 years, the average being 47.62 years. More than half (56 percent) of the growers fell in the middle aged category (41 to 55 years) compared to 30 percent falling in the young category (up to 40 years) and 14 percent in old aged category (above 55 years).

Education

Education of the growers ranged form illiteracy to 15 years schooling, the average being 8.02 years of schooling. 12 percent illiterate while 32 percent of the growers had secondary level education and 16 percent of the growers had primary level education and 40 percent of the growers had above secondary level education.

Family Size

Family size of growers ranged from 4 to 10 members, the average being 6.44 members. More than half (72 percent) of the growers fell in the middle family category (5 to 7 members) compared to 26 percent falling in the large family category (above 7 members) and only 2 percent in small category (2 to 4 members)

Farm Size

Farm size of the respondents ranged from 0.146 to 9.84 hectares. The average farm size was found to be 1.32 hectares. Highest proportion (48 percent) of the growers had medium farm (1 to 2 hectare) compared to 46 percent of small farm (up to 1 hectares) and only 6 percent of large farm size (above 2 hectares).

Area under Banana Cultivation:

Scores of area of the growers under banana cultivation ranged from 0.0202 to 0.183 hectares with an average of 0.048 hectares. Most (68 percent) of the growers had small area(up to 0.0405 hectares) followed by 26 percent having medium area (0.0406 to 0.0810) and only 6 percent having big area (above 0.0810 hectare).

Annual Income:

Annual income of the growers ranged from Take 22340.00 to 1890,000.00 with an average of Taka 222520.00. It was observed that 32 percent of the growers had low income (up to 120,000.00 per year) compared to 54 percent of the growers having medium annual income (Tk.121,000.00 to Tk. 250,000.00 per year) and 14 percent of the growers having high annual income (above Tk.250,000.00 per year).

Agricultural Knowledge in Banana Cultivation:

Scores for knowledge of the growers in banana cultivation ranged from 10 to 22 against the possible range of 0 to 30, the average being 17.1. Most of the growers medium knowledge (64 percent) and 24 percent had poor knowledge. Only 12 percent having high knowledge.

Social Participation:

Social participation scores of the respondents ranged from 0 to 10, the average being 2.14. Data analysis showed that 14 percent growers did not participate compared to 66 percent having low participation, 8 percent having medium participation and 12 percent having high participation.

Extension Contact:

Computed extension contact scores ranged from 4 to 14 with an average 9.06. Maximum growers (54 percent) had medium extension contact followed by 24 percent having low extension contact and 22 percent having high extension contact.

Summary of Hypothesis Testing

In order to examine the relationships of the selected characteristics of the growers with their faced constraints in banana cultivation, hypothesis were advanced and tested. The results of the hypothesis testing are presented below:

Age and Constraints in Banana Cultivation:

There was no significant relationship between the age of the growers and their faced constraints (improved banana sucker, disease, agricultural credit, field management, marketing and overall constraints) in banana cultivation, but a negative trend were found between the variables.

Education and Constraints in Banana Cultivation:

There was no significant relationship between the education of the growers and their faced constraints (agricultural credit and field management) in banana cultivation, but a negative trend were found between the variables.

There was a significant negative relationship between the education of the growers and constraints of improved banana sucker, disease, marketing and overall constraints in banana cultivation at 0.05 level of probability.

Family Size and Constraints in Banana Cultivation:

There was no significant relationship between the family size of the growers and their faced constraints (disease, agricultural credit and overall constraints) in banana cultivation, but a negative trend were found between the variables.

There was no significant relationship between the family size of the growers and their faced constraints (improved banana sucker, field management and marketing) in banana cultivation, but a positive trend were found between the variables.

Farm Size and Constraints in Banana Cultivation:

There was a significant negative relationship between the farm size of the growers and constraints of improved banana sucker in banana cultivation at 0.01 level of probability.

There was a significant negative relationship between the farm size of the growers and constraints of disease in banana cultivation at 0.05 level of probability.

There was a significant negative relationship between the farm size of the growers and constraints of credit in banana cultivation at 0.001 level of probability.

There was no significant relationship between the farm size of the growers and constraints of field management in banana cultivation, but a negative trend was found between the variables.

There was a significant negative relationship between the farm size of the growers and constraints of marketing in banana cultivation at 0.05 level of probability.

There was a significant negative relationship between the age of the growers and overall constraints faced in banana cultivation at 0.05 level of probability.

Area under Banana Cultivation and Constraints in Banana Cultivation:

There was no significant relationship between the area under banana cultivation of the growers and their faced constraints (improved banana sucker, disease, agricultural credit and field management) in banana cultivation, but a negative trend were found between the area under banana cultivation and improved sucker and disease and a positive trend were found between the area under banana cultivation and credit, field management and overall constraints.

There was a significant negative relationship between the area under banana cultivation of the growers and constraints of marketing in banana cultivation at 0.05 level of probability.

Annual Income and Constraints in Banana Cultivation:

There was a significant negative relationship between the annual income of the growers and constraints of improved banana sucker in banana cultivation at 0.01 level of probability.

There was a significant negative relationship between the annual income of the growers and constraints of disease in banana cultivation at 0.05 level of probability.

There was a significant negative relationship between the annual income of the growers and constraints of credit in banana cultivation at 0.001 level of probability.

There was no significant relationship between the annual income of the growers and constraints of field management in banana cultivation, but a negative trend was found between the variables.

There was a significant negative relationship between the annual income of the growers and constraints of marketing in banana cultivation at 0.05 level of probability.

There was a significant negative relationship between the annual income of the growers and overall constraints faced in banana cultivation at 0.001 level of probability.

Agricultural Knowledge in Banana Cultivation and Constraints in Banana Cultivation:

There was no significant relationship between the agricultural knowledge of the growers and their faced constraints (improved banana sucker, agricultural credit and field management) in banana cultivation, but a negative trend were found between the variables without field management.

There was a significant negative relationship between the education of the growers and constraints of disease, marketing and overall constraints in banana cultivation at 0.05 level of probability.

Social Participation and Constraints in Banana Cultivation:

There was no significant relationship between the social participation of the growers and their faced constraints (marketing and field management) in banana cultivation, but a negative trend were found between the variables.

There was a significant negative relationship between the social participation of the growers and constraints of improved banana sucker and overall constraints in banana cultivation at 0.01 level of probability.

There was a significant negative relationship between the social participation of the growers and constraints of disease and credit in banana cultivation at 0.05 level of probability.

Extension Contact and Constraints in Banana Cultivation:

There was no significant relationship between the extension contact of the growers and their faced constraints (improved banana sucker, disease, credit and overall constraints) in banana cultivation, but a positive trend were found between the variables without improved sucker.

There was a significant negative relationship between the extension contact of the growers and constraints of field management in banana cultivation at 0.01 level of probability.

There was a significant negative relationship between the extension contact and constraints of marketing in banana cultivation at 0.05 level of probability.

Conclusions

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

1. The study investigated the extent of constraints faced by the growers in cultivating banana in five selected aspects namely improved banana sucker, disease, agricultural knowledge, field management and marketing. The findings indicate that the growers faced considerable constraints in all the five aspects of cultivating banana. However, the extent of constraint faced by them in marketing was the highest while constraint in disease was second. Constraints faced by the growers in respects of improved banana sucker, management and agricultural credit in banana cultivation ranked the third, fourth and fifth position. In view of this fact, it may be concluded that effort for increasing banana production in Bangladesh will not be successful, if the banana growers continue to face constraints in various aspects especially in marketing, disease and improved sucker.

2. Education of the banana growers had significant negative relationships with their faced constraints in improved banana sucker, disease, marketing and overall constraints (table 22). This means that the higher the education of the banana growers the lower was their faced constraints improved banana sucker, disease, marketing and overall constraints. Education helps an individual to get useful information to solve their various problems through learning, knowing personal communication, receiving training, adopting new ideas etc. Literate persons will be able to solve their various problems through reading leaflets, booklets, other printed materials, etc. related to banana. So, education is a very important factor for the banana growers to uplift their conditions. It may be, therefore, concluded that a literacy programme will be very important in the study area.

3. The findings of the study reveal that more than half (72) percent of the banana growers had medium family size while 2 percent had small family and 26 percent had big family size. If the family size is big it is difficult to maintain the family through their income, on the other hand it is easy to maintain small family. Foregoing facts indicate that family planning should be introduced among the banana growers so that they keep their family small in size. Motivation work to be done so that the members may check the rapid growth of population.

4. The average farm size in the study area is usually smaller. The findings indicate that a negative relationship between farm size of the banana growers and their constraints in all aspects of banana cultivation without field management. In the context of Bangladesh, it is difficult to increase the farm size. However, the small farm owners with small income may be helped by different government organizations and NGOs to provide credit facilities for purchasing various inputs for production.

5. Annual income had significant negative relationships with their constraints in improved banana sucker, disease, credit, marketing and overall constrains. This means that higher income of the banana growers lower was their constraints in improved banana sucker, disease, credit, marketing and overall constrains. In view of the above facts it may be concluded that majority of the banana growers will continue to face problem unless steps are taken to help them to increase their income.

6. The findings indicate that agricultural knowledge of the growers had significant negative relationship with their constraints in disease, marketing and overall constraints. Agricultural knowledge of the growers helps them to understand the various complex and complicated issues of banana cultivation. Cultivation of banana requires a series of operations form its beginning until its harvesting. Each of the operations needs technical knowledge. Most of the sample growers (88 percent) were found to have low or poor knowledge in agriculture. The growers faced considerable problems in cultivating banana crops.

7. Organizational participation in different organizations makes people aware of various development programmes and helps them know different agencies who supply agricultural inputs and work for them. It has been observed in this study

8. The findings indicate that the grower's extension contact had significant negative relationship with their constraints in field management, marketing and overall constraints in banana cultivation. This indicates that growers having higher extension contact faced lower constraints. This leads to the conclusion that increasing extension contact will give the growers good opportunities to overcome their different constraints in banana cultivation.

9. Regarding overall constraints faced by the banana growers, 64 percent banana growers faced medium, 20 percent banana growers faced high and only 16 percent banana growers faced low constraints in banana cultivation. Totally 84 percent growers faced medium to high constraints in banana cultivation. From this fact, it may conclude that until the banana growers are free from different constraints in banana production, they will not be in a position to adopt improved technology in banana production.

Recommendations

On the basis of findings and conclusions following recommendations are presented:

1. Banana is the principal fruit in Bangladesh. Banana contributes an important role in the total fruit cultivation in the country. Findings of the study indicate that the growers faced highest constraints in marketing. Hence, it is recommended that following steps should be taken to remove this constraint

i) Establish a whole sell banana market to ensure proper market price for the growers, otherwise the intermediaries would be benefited at cost of growers and other hand banana growers would be discouraged to cultivate banana.

ii) Facilities of store-house, industrialization and transport and communication facilities should be taken where necessary.

2. The banana growers faced serious constraints in disease in their banana field. Hence, it is recommended that some effective steps should be taken by reducing the price of the pesticides, availability of pesticides and the sprayers have to technical knowledge about pesticides by the concerned authorities so that the harmful insects and disease in time.

3. The banana growers also faced serious constraints in improved banana sucker in their banana field. Hence, it is recommended that some effective steps should be taken by reducing the price of the improved banana sucker, availability of improved banana sucker and desirable banana sucker, available of printed materials and advises from the extension worker about improved sucker.

4. The banana growers also faced serious constraints in field management in their banana field. To remove these constraints, sufficient number of labour, power pumps, availability of bamboo pole and other irrigation facilities should be taken when need.

5. Agricultural credit is one of the vital constraints in the study area. To remove these constraints, amendment of existing loan giving procedure is necessary. Bank should provide special credit for the banana growers, especially for the small (marginal) growers. Much of the management constraint could be removed by providing necessary credit.

6. The education of the growers is necessary for any development programme. It is necessary for effective programme to provide functional literacy to the growers so that at least they can read and write and can perform useful works in connection with his farm, home and community.

7. Family size of the banana growers is an important factor to face constraints. Banana growers those have big family size; they faced comparatively more problems in respect of family maintenance and other development work. So it is recommended that family planning programmes should massively be introduced among the banana growers and this encourages them to keep the family small in size.

8. Agricultural knowledge plays a vital role in performing agricultural operations effectively and efficiently. It is, therefore, recommended that arrangement should be made for providing proper agricultural knowledge through training, tours, fair and exhibition, method demonstration, meeting at result demonstration and the like.

9. Participation in agriculture related organizations helps banana growers develop abilities and attitudes to work in co-operation and co-ordination with others for solution of problems. But there is an acute dearth of agriculturally related organizations in the rural areas of Bangladesh. Consequently, the banana growers get too little opportunity to participate in such organizations. In view of the great importance of agriculture related rural organizations in solving agricultural problems, it is recommended that the extension workers should make utmost efforts to setup various kinds of agricultural organizations in the rural parts and to encourage banana growers to participate in them.

10. Extension contact of the banana growers in the study area has been found to be low. So, it is recommended that arrangements for tour of banana growers to visit different banana projects, agricultural research stations, agricultural farms, agricultural university and other agricultural and related organizations will enable banana growers to acquire knowledge, skill and attitude.

11. In addition to banana cultivation constraints, the growers also face others constraints such as social, economic, and other domestic constraints. All these constraints affect the performance of the banana growers. There is need for undertaking researches in various constraints of them which affect their performance in banana cultivation.

Recommended for Further Study

This study investigated constraints faced by the growers in respects of banana cultivation. There is need for investigation of other potential crops.

1. The relationships of nine important characteristics of the banana growers with their faced constraints in five aspects, namely improved sucker, disease, agricultural credit, field management and marketing regarding banana have been investigated in this study. Further research may be undertaken for exploring relationship of other characteristics of the banana growers with other faced constraints such as lack of irrigation equipments, shortage of sufficient land for banana cultivation.

2. The present study conducted on the population of the banana growers of seventeen villages of Sonargaon upazila under Narayangonj district. Findings of the study need to be varied by undertaking similar research in other banana growing zones of the country.

3. Research should be undertaken that the effectiveness of agricultural extension service and other related organizations in helping people solve their agricultural problems.

4. In addition to constraints in banana cultivation, the banana growers also face other constraints such as social, economic, housing, sanitation, nutrition and domestic etc.

5. All these constraints affect the performance of the growers. There is need for undertaking research on the various constraints faced by the growers which affect their performance.

CHAPTER VI

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APPENDIX-A

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INTERVIEW SCHEDULE FOR A RESEARCH STUDY ON

CONSTRAINTS FACED BY THE GROWERS IN BANANA CULTIVATION IN SONARGAON UPAZILA UNDER NARAYANGONJ DISTRICT

Serial no.....
Name of the respondent:.....
Village..... Union.....
Upazila..... 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) ..... (Never attended school, but I can little read and write)
   iv) (Up to the level of class .....Passed class/ Examination)
3. Including yourself, how many members belong to your family?
   Male: ..... Nos. Female: .....Nos. Total: .....Nos.
4. Furnish the area of your lands according to use:

Serial no	Type of land	Local unit	Hectare
1	Own house		
2	Own land under own cultivation		
3	Land taken from other on borga		
4	Land taken from other on lease		
5	Own land given to others on borga		
6	Own land given to others on lease		
7	Others (Please mention)		
	Total		

5. Mention the area you have cultivated banana last year.
..... Local unit .....hectare

6. Please mention your annual income:
a)

Source of income	Amount (maund)	Price (Tk./maund)	Total taka
1. Agricultural sector			
a) Rice			
b) Wheat			
c) Jute			
d) Potato and sweet potato			
e) Pulses			
f) Vegetables			
g) Fruits			
h) Poultry			
i) Cattle			
j) Fishes			
k) Others (Please mention)			
2. Services			
3. Business			
Total			

6 (b): Please mention your annual income from banana cultivation last Year:.....

Total income= 6 (a) + 6 (b) = ...Taka

7. Please answer the following questions in connection with banana cultivation:

Sl. No.	Questions	Score	Score obtained
1	What are the soil elements?	2	
2	What do you mean by organic manure?	1	
3	What is balanced fertilizer?	2	
4	What type of land is suitable for banana cultivation?	1	
5	When manuring is needed in banana cultivation?	2	
6	How many tillage is needed in banana cultivation?	2	
7	When irrigation is needed in banana field?	2	
8	Mention two improved varieties of banana.	2	
9	How urea should apply in banana field?	2	
10	Name three diseases of banana	3	
11	When will you do weeding?	2	
12	Mention the optimum time of banana cultivation.	2	
13	Which of type sucker are you cultivated?	2	
14	Name two pesticides and one insecticide.	3	
15	What is I.P.M.?	2	
	Total	30	

8. Please mention your nature of participation (past or present) in the following social organization:

Sl. No.	Name of organization	No participate	Nature of participation		
			As ordinary member	As executive member	As officer
1	Krishak sambay samity				
2	Bazar committee				
3	Youth club				
4	School committee				
5	Madrasha committee				
6	Mosque/Mondir/Girza committee				
7	Union council				
8	NGO				
9	Others (specify)				

9. Please mention your nature of extension contact with the following media of information:

Sl. No.	Extension personnel	Nature of extension contact			
		Often	Occasionally	Rarely	Not at all
1	Banana cultivated farmers				
2	Dealers (Fertilizer, pesticide)				
3	Experienced farmers				
4	Radio/ Television				
5	Block supervisor				
6	Agricultural extension officer				
7	Upazila Agricultural officer				

10. Please indicate the extent of hindrance caused by the following constraints relating to use Improved sucker in Banana cultivation:

Sl. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Non-availability of improved sucker in time				
2	Inadequate supply of improved sucker				
3	Collecting sucker from long distance				
4	Inability to purchase for high priced improved sucker				
5	Non-availability of advises from extension worker timely about improved sucker				
6	Non-availability of desirable sucker				
7	Non-availability of printed materials about improved sucker				

11. Please indicate the extent of hindrance caused by the following constraints relating to disease on Banana cultivation:

Sl. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Massive damage of banana cultivation due to disease				
2	Non-availability of pesticides in time				
3	Inability to purchase pesticides due to high price				
4	Inability to select appropriate pesticide				
5	Lack of machinery for applying pesticide				
6	Lack of proper knowledge regarding the control of disease				
7	Lack of necessary advises from extension worker to control pest				

12. Please indicate the extent of constraints faced by you in Agricultural credit receive in respect of Banana cultivation:

Did you take any credit in the last year for banana cultivation? .....Yes/No

If yes, mention the following constraints regarding to banana cultivation

Sl. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Inadequacy of credit against in the demand				
2	Non-availability of credit in time				
3	Complex formalities				
4	Difficulty to communicate to the bank due to long distance from the rural area				
5	Interest of loan is too high				
6	Difficulty to getting loan due to joint ownership of lands				
7	Disinterest in getting loan when land mortgage is a pre requisite				
8	Use of middleman to get loan				
9	Difficulty to know the proper distribution time of credit				
10	Effect of bribes to get loan				

13. Indicate the extent of constraints faced by you in field management in Banana cultivation:

Sl. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Collection of banana from different plant in different days				
2	Massive attack of weeds at the primary stage of sucker growing				
3	Requiring more labours in banana cultivation				
4	Requiring more cost due to increase the price of kerosene and diesel etc.				
5	Facing constraints due to cattle				
6	Facing constraints due to stealing the banana				
7	Increasing cost due to use of poles				
8	Damage the banana plants due flooding, storms etc.				

14. Please indicate the extent of constraints faced by you in marketing in Banana cultivation:

Sl. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Not getting satisfactory price during selling the banana				
2	Facing constraints in selling the banana in time				
3	Not getting the price at a time after selling the banana				
4	Non-availability of Government store-house facilities				
5	Lack of proper communication				
6	Transport problems due to long distance of market area				

Date: .....

.....

Signature of the interviewer

কৃষি সম্প্রসারণ ও ইনফরমেশন সিস্টেম বিভাগ

শেরে বাংলা কৃষি বিশ্ববিদ্যালয়

শেরে বাংলা নগর, ঢাকা-১২০৭।

নারায়নগঞ্জ জেলার সোনার গাঁ উপজেলার কৃষকরা কলাচাষে যে সকল সমস্যার সম্মুখীন হয়, তার উপর গবেষণা মূলক সাক্ষাৎকার সূচীঃ

ক্রমিক নং ----------

উত্তরদাতার নাম ----------

গ্রাম ----------ইউনিয়ন ----------

উপজেলা ---------- জেলা ----------

(অনুগ্রহ পূর্বক নিম্নোক্ত প্রশ্নগুলোর উত্তর দিন এবং আপনার সরবরাহকৃত তথ্যাদি সম্পূর্ণ গোপন রাখা হবে এবং কেবলমাত্র গবেষণার কাজে ব্যবহৃত হবে)

১। আপনার বয়স কত? ----------বছর

২। আপনার শিক্ষাগত যোগ্যতার বিবরণ দিনঃ

ক) পড়াশোনা জানি না

খ) পড়াশোনা জানি না তবে সাক্ষর দিতে পারি

গ) কখনও বিদ্যালয়ে যাই নি, তবে সামান্য পড়তে ও লিখতে জানি

ঘ) আপনি কোন শ্রেণী পর্যন্ত লেখাপড়া করেছেন ------- শ্রেণী/পরীক্ষা পাশ

৩। আপনিসহ আপনার পরিবারের সদস্য সংখ্যা কত?

পুরুষ --------জন স্ত্রী লোক ----------জন মোট ----------জন

৪) অনুগ্রহ পূর্বক ব্যবহার অনুসারে আপনার জমির পরিমানের বিবরণ দিনঃ

ক্রঃ নং	জমির ধরণ	স্থানীয় একক	হেক্টর
১	নিজের বসতবাড়ী		
২	নিজ দ্বারা চাষকৃত নিজস্ব জমি		
৩	অন্যের কাছ হতে নেয়া বর্গা জমি		
৪	অন্যের কাছ হতে নেয়া লীজ জমি		
৫	অন্যকে বর্গা দেয়া জমি		
৬	অন্যকে লীজ দেয়া জমি		
৭	অন্যান্য (দয়া করে উল্লেখ করুন)		
	মোট		

৫) গত বছর আপনি কি পরিমান জমিতে কলা চাষ করেছেন?

----------স্থানীয় একক ----------হেক্টর

৬) অনুগ্রহ পূর্বক আপনার বাৎসরিক আয়ের বিবরণ দিনঃ

ক)

আয়ের উৎস	পরিমান (মন)	দাম টাকা/মন	মোট টাকা
১. কৃষিজ পন্যঃ			
ক) ধান			
খ) গম			
গ) পাট			
ঘ) আলু এবং মিষ্টি আলু			
ঙ) বিভিন্ন রকম ডাল			
চ) শাক-সব্জি			
ছ) ফল			
জ) হাঁস মুরগী			
ঝ) গবাদী পশু			
ঞ) মৎস চাষ			
ট) অন্যান্য (নির্দিষ্ট করে উল্লেখ করুন)			
২. চাকুরী হতে			
৩. ব্যবসা হতে			

৬) খ) গত বছর কলা চাষ হতে আপনার বাৎসরিক আয় উল্লেখ করুন।

----------টাকা

মোট বাৎসরিক আয় = ৬ (ক) + ৬ (খ) ---------- টাকা।

৭) অনুগ্রহ পূর্বক কলা চাষের সাথে সম্পৃক্ত নিম্নোক্ত প্রশ্নগুলোর উত্তর দিনঃ

ক্রঃ নং	প্রশ্ন	নম্বর	প্রাপ্ত নম্বর
১	মাটির উপাদান কি কি?	২	
২	জৈব সার বলতে কি বুঝেন?	১	
৩	সুষম সার কাকে বলে?	২	
৪	কলা চাষের জন্য কি ধরনের জমি উপযুক্ত?	১	
৫	কলাচাষে কখন সার প্রয়োগ করতে হয়?	২	
৬	কলা চাষে কতবার জমি চাষ দিতে হয়?	২	
৭	কলা চাষে কখন সেচের প্রয়োজন হয়?	২	
৮	কলার দুটি উন্নত জাতের নাম বলুন?	২	
৯	কলার জমিতে কিভাবে ইউরিয়া ব্যবহার করা উচিৎ	২	
১০	কলার তিনটি রোগের নাম বলুন?	৩	
১১	কখন আগাছা দমন করতে হয়?	২	
১২	কলা চাষের উপযুক্ত সময় বলুন?	২	
১৩	আপনি কোন ধরনের চারা চাষ করেছেন?	২	
১৪	কলার দুটি পেস্টি সাইড ও একটি ইনসেকটিসাইড এর নাম বলুন	৩	
১৫	আই.পি.এম (IPM) বলতে কি বুঝেন?	২	
	মোট =	৩০	

৮) অনুগ্রহ পূর্বক নিম্নোক্ত সামাজিক সংগঠনের সাথে সম্পৃক্ততার (বর্তমান বা অতীত) কথা উল্লেখ করুনঃ

ক্রঃ নং	সংগঠনের নাম	সম্পৃক্ত নয়	সম্পৃক্ততার ধরন		
			সাধারণ সদস্য হিসাবে	নির্বাহী সদস্য হিসাবে	কর্মকর্তা হিসাবে
১	কৃষক সমবায় সমিতি				
২	বাজার কমিটি				
৩	যুবক ক্লাব				
৪	স্কুল কমিটি				
৫	মাদ্রাসা কমিটি				
৬	মসজিদ/মন্দির/গীর্জা কমিটি				
৭	ইউনিয়ন পরিষদ				
৮	বেসরকারী সংস্থা				
৯	অন্যান্য (নির্দিষ্ট করুন)				

৯) কৃষি সম্প্রসারণ যোগাযোগ ঃ

ক্রঃ নং	সম্প্রসারণ কর্মকর্তা	প্রায়ই	মাঝে মাঝে	কদাচিৎ	মোটেই না
১	কলাচাষী কৃষি				
২	ব্যবসায়ী (সার পেস্টিসাইড)				
৩	অভিজ্ঞ কৃষক				
৪	রেডিও/টেলিভিশন				
৫	ব্লক-সুপারভাইজার				
৬	কৃষি সম্প্রসারণ কর্মকর্তা				
৭	উপজেলা কৃষি কর্মকর্তা				

১০) আপনি কলা চাষে উন্নত চারা ব্যবহারে সেসকল সমস্যাস্থ সম্মুখীন হন, তার সঠিক বিবরণ দিন (অনুগ্রহ পূর্বক টিক দিন)ঃ

ক্রঃ নং	সমস্যা	সমস্যা সম্মুখীন হবার ধরণ			
		খুব বেশী	বেশী	সামান্য	মোটেই না
১	সময়মত উন্নতচারার অভাব				
২	উন্নতচারার অপর্যাপ্ত সরবরাহ				
৩	অনেক দুর হতে চারা সংগ্রহ				
৪	উচ্চমূল্যে উন্নতচারা ক্রয় করার অসমার্থ্যতা বা ব্যর্থতা				
৫	উন্নত চারা সম্পর্কে সম্প্রসারণ কর্মী হতে উপদেশের অভাব				
৬	কাঙ্খিত চারার অভাব				
৭	উন্নত চারা সম্পর্কে মুদ্রিত সামগ্রীর অভাব				

১১) আপনি কলা চাষে বিভিন্ন রোগবালাই দ্বারা যে সকল সমস্যার সম্মুখীন হোন, তার বিবরণ দিন (অনুগ্রহ পূর্বক টিক দিন)ঃ

ক্রঃ নং	সমস্যা	সমস্যা সম্মুখীন হবার ধরণ			
		খুব বেশী	বেশী	সামান্য	মোটেই না
১	রোগের মাধ্যমে কলাচাষে ক্ষতি হয়				
২	সময়মত কীটনাশকের অভাব				
৩	উচ্চমূল্যের কারণে কীটনাশক ক্রয় করার ব্যর্থতা				
৪	সঠিক কীটনাশক নির্বাচন করার অসামর্থ্যতা				
৫	কীটনাশক প্রয়োগ করার যন্ত্রপাতির অভাব				
৬	রোগদমন করার সঠিক জ্ঞানের অভাব				
৭	কীট দমনে সম্প্রসারণ কর্মীহতে প্রয়োজনীয় উপদেশের অভাব				

১২) আপনি কলা চাষে কৃষি ঋণ যে সকল সমস্যার সম্মুখীন হোন, তার সটিক বিবরণ দিন (অনুগ্রহ পূর্বক টিক দিন)ঃ

আপনি কলা চাষে গত বছর কৃষি ঋণ গ্রহণ করেছেন? .....হ্যাঁ / না

যদি হ্যাঁ হয় তবে নিম্নোক্ত প্রশ্নগুলোর উত্তর দিন

ক্রঃ নং	সমস্যা	সমস্যা সম্মুখীন হবার ধরণ			
		খুব বেশী	বেশী	সামান্য	মোটেই না
১	চাহিদা অনুসারে ঋণের অপর্যাপ্ততা				
২	সময়মত ঋণের অভাব				
৩	জটিল আনুষ্ঠানিকতা				
৪	পল্লী এলাকা হতে অনেক দুরত্বের কারণে ব্যাংকের সাথে যোগাযোগ কঠিন				
৫	ঋণের সুদের হার বেশী				
৬	যৌথ মালিকানাধীন জমির ক্ষেত্রে ঋণ তোলা কঠিন				
৭	জমি বন্ধক দিয়ে ঋণ পেতে অনিচ্ছা				
৮	ঋণ পেতে দালালের প্রভাব				
৯	ঋণ বিতরণের সঠিক সময় জানা কঠিন				
১০	ঋণ পেতে ঘুষের প্রভাব				

১৩) কলা জমি ব্যবস্থাপনায় আপনি যে সকল সমস্যার সম্মুখীন হোন, তার সঠিক বিবরণ দিন (অনুগ্রহ পূর্বক টিক দিন)ঃ

ক্রঃ নং	সমস্যা	সমস্যা সম্মুখীন হবার ধরণ			
		খুব বেশী	বেশী	সামান্য	মোটেই না
১	বিভিন্ন গাছ হতে বিভিন্ন সময় কলা সংগ্রহ করা হয়				
২	চারা বৃদ্ধির প্রাথমিক পর্যায়ে আগাছার ব্যাপক বৃদ্ধি				
৩	কলা চাষে বেশী শ্রমিকের প্রয়োজন হয়				
৪	কেরোসিন ও ডিজেল ইত্যাদির দাম বৃদ্ধির ফলে উৎপাদন খরচ বেশী হয়				
৫	কলার জমিতে গরু ছাগল দ্বারা সমস্যার সম্মুখীন হয়				
৬	কলার জমি হতে কলা চুরি হয়				
৭	খুঁটি ব্যবহারের ফলে উৎপাদন খরচ বৃদ্ধি পায়				
৮	ঝড়, তুফান, বন্যা ইত্যাদির কারণে কলা গাছের ক্ষতি বা ভেঙ্গে যাওয়ার ফলে ক্ষতি হয়।				

১৪) আপনি কলা বাজারজাত করনে যে সকল সমস্যার সম্মুখীন হোন, তার সঠিক বিবরণ দিন (অনুগ্রহ পূর্বক টিক দিন)ঃ

ক্রঃ নং	সমস্যা	সমস্যা সম্মুখীন হবার ধরণ			
		খুব বেশী	বেশী	সামান্য	মোটেই না
১	কলা বিক্রির সময় সন্তোষজনক বা উপযুক্ত মূল্য পাওয়া যায়, না				
২	সময়মত কলা বিক্রির সময় সমস্যার সম্মুখীন হই				
৩	কলা বিক্রির পর এক সাথে মূল্য পাওয়া যায় না				
৪	সরকারী গুদাম জাত করনের সুবিধাসমূহের অপর্যাপ্ততা				
৫	সঠিক যোগাযোগ ব্যবস্থার অভাব				
৬	বাজার অনেক দুরে হলে পরিবহন সমস্যা হয়				

(সহযোগীতা করার জন্য আপনাকে অনেক ধন্যবাদ)

তারিখ ----------

সাক্ষাৎকার গ্রহীতার স্বাক্ষর