

**CONSTRAINTS FACED BY THE FARMERS IN IPM
PRACTICES IN RICE CULTIVATION AT NABINAGAR
UPAZILA UNDER BRAHMANBARIA DISTRICT**

BY

MD. AL - AMIN

Reg. No. 06-02109

A thesis

*Submitted to the Faculty of Agriculture
Sher-e-Bangla Agricultural University, Dhaka-1207,
in partial fulfillment of the requirements
for the degree of*

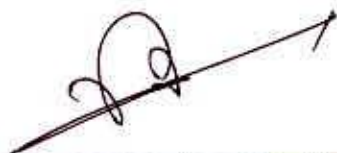
MASTER OF SCIENCE (MS)

IN

AGRICULTURAL EXTENSION AND INFORMATION SYSTEM

SEMESTER: JAN-JUN, 2013

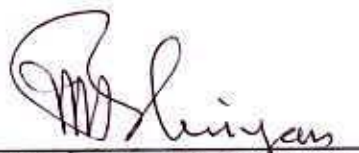
APPROVED BY:



Asst. Prof. Md. Abul Bashar

Supervisor

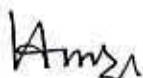
Dept. of Agricultural Extension and Information System
Sher-e-Bangla Agricultural University
Dhaka



Prof. Mohammad Hossain Bhuiyan

Co-Supervisor

Dept. of Agricultural Extension and Information System
Sher-e-Bangla Agricultural University
Dhaka



Prof. Dr. Md. Sekender Ali

Chairman

Examination Committee

Dept. of Agricultural Extension and Information System
Sher-e-Bangla Agricultural University



**DEPARTMENT OF AGRICULTURAL EXTENSION
AND INFORMATION SYSTEM**
Sher-e-Bangla Agricultural University
Sher-e-Bangla Nagar, Dhaka-1207


Memo No: SAU/

CERTIFICATE

This is to certify that the thesis entitled **“Constraints Faced by the Farmers in IPM Practices in Rice Cultivation at Nabinagar Upazila under Brahmanbaria 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 in Agricultural Extension and Information System**, embodies the result of a piece of bona fide research work carried out by **Md. Al - Amin**, Registration No. **06-02109** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

Dated:
Dhaka, Bangladesh


Asst. Prof. Md. Abul Bashar
Supervisor

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



**DEDICATED
TO
MY BELOVED PARENTS**

ACKNOWLEDGEMENTS

All praises to Almighty Allah, the Great, Gracious, Mercifull, Whose blessings enabled the author to complete this research work successfully.

In particular, the author deems it a great pleasure to express his profound thankfulness to his respected parents, who entiled much hardship inspiring for prosecuting his studies, receiving proper education.

The author deems it a proud privilege to express his deep sense of gratitude, sincere appreciation and immense thanks to his supervisor Assistant Professor Md. Abul Bashar, Sher-e-Bangla Agricultural University, Dhaka, for his continuous guidance, cooperation, constructive criticism and helpful suggestions in carrying out the research work and preparation of this thesis, without his intense co-operation this work would not have been possible.

The author feels proud to express his deepest respect, sincere appreciation and immense indebtedness to his co-supervisor Prof. Mohammad Hossain Bhuiyan, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka, for his scholastic and continuous guidance, constructive criticism and valuable suggestions during the entire period of course and research work and preparation of this thesis. The author also expresses his heartfelt thanks to all the teachers of the Department of Agricultural Extension and Information System, SAU, for their valuable teaching, suggestions and encouragement during the period of the study.

Special and thankful appreciation is also due to -- for their fellow feelings and encouragement during the study period.

Last but not the least, the author expresses his immense indebtness, deepest sense of gratitude and profound gratefulness to his friends who had been a constant source of blesings, inspiration and encouragement for his higher study.

The Author



TABLE OF CONTENTS

CHAPTER	Page
ACKNOWLEDGEMENTS	i
TABLE OF CONTENTS	ii
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF APPENDICES	vi
LIST OF ABBREVIATIONS	vii
ABSTRACT	viii
1. INTRODUCTION	01
1.1 General Background	01
1.2 Statement of the Problem	03
1.3 Specific Objectives of the Study	04
1.4 Justification and Scope of the Study	05
1.5 Assumption of the Study	07
1.6 Limitation and Scope of the Study	07
1.7 Definition of Key Terms	08
2. REVIEW OF LITERATURE	11
2.1 Constraints faced by the farmers in different agricultural aspects	11
2.2 Review of past studies on the relationship between the selected characteristics of the farmers and constraints faced in IPM practices	16
2.3 Conceptual Framework of the study	22

CHAPTER	Page
3. METHODOLOGY	25
3.1 Locale of the study	25
3.2 Population and sample	25
3.3 The Research instrument	28
3.4 Measurement of variables	29
3.4.1 Measurement of selected characteristics of the farmers	29
3.4.2 Measurement of constraints faced in IPM practices	33
3.5 Hypothesis of the study	33
3.6 Data collection procedure	33
3.7 Data processing	34
3.8 Statistical analysis of data	34
4. RESULTS AND DISCUSSION	36
4.1 Characteristics of the farmers	36
4.1.1 Age	36
4.1.2 Education	37
4.1.3 Total family members	38
4.1.4 Rice cultivation area	38
4.1.5 Training received in IPM practices	39
4.1.6 Annual family income	40
4.1.7 Extension media contact	41
4.1.8 Agricultural experience	41
4.1.9 Cosmopolitaness	42
4.1.10 Knowledge on IPM	43



CHAPTER	Page
4.2 Constraints faced in IPM practices	44
4.3 Relationship between the constraints faced by the farmers in IPM practices in rice cultivation and their selected characteristics	45
5. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	55
5.1 Summary of Findings	55
5.1.1 Characteristics of the farmers	55
5.1.2 Constraints faced in IPM practices	57
5.1.3 Relationship between the constraints faced in IPM practices by the farmers in rice cultivation with their selected characteristics	57
5.2 Conclusions	57
5.3 Recommendations for policy implications	59
5.3.1 Recommendation for further study	60
BIBLIOGRAPHY	62
APPENDICES	73

LIST OF TABLES

	Title	Page
Table 1	List of most affected Monga areas of Gaibandha district in 2007	02
Table 3.1.	Distribution of the sample population and number of rice farmers in the reserve list	28
Table 4.1.	Distribution of the farmers according to their age	36
Table 4.2.	Distribution of the farmers according to their education	37
Table 4.3.	Distribution of the farmers according to their total family members	38
Table 4.4.	Distribution of the farmers according to their rice cultivation area	39
Table 4.5.	Distribution of the farmers according to their training received in IPM practices	39
Table 4.6.	Distribution of the farmers according to their annual family income	40
Table 4.7.	Distribution of the farmers according to their extension media contact	41
Table 4.8.	Distribution of the farmers according to their agricultural experience	42
Table 4.9	Distribution of the farmers according to their cosmopolitaness	43
Table 4.10	Distribution of the farmers according to their knowledge on IPM	43
Table 4.11	Distribution of the farmers according to their constraints faced in IPM practices	44
Table 4.12	Pearson's product moment co-efficient of correlation showing relationship between the constraints faced in IPM practices in and their selected characteristics	45

LIST OF FIGURES

	Title	Page
Figure 2.1	The conceptual framework of the study	24
Figure 3.1	Map of Brahmanbaria District showing Nabinagar Upazila	26
Figure 3.2	Map of Nabinagar Upazila Showing the Study Areas	27

LIST OF APPENDICES

	Title	Page
Appendix-A	English version of the interview schedule	73
Appendix-B	Correlation Matrix	78

LIST OF ABBREVIATIONS OF SYMBOLS AND TERMS

Abbreviation	Full Word
<i>et al.</i>	And others (at elli)
BBS	Bangladesh Bereau of Statistics
CV	Coefficient of Variation
d.f.	Degrees of Freedom
DAE	Department of Agricultural Extension
etc.	Etcetera
e.g.	Example
ha	Hectare
Tk.	Taka
i.e.	That is
Km	Kilometer
viz.	Namely
NGO	Non-Government Organization
%	Percent
PCI	Problem Confrontation Index
r	Pearson's Product Moment Correlation Co-efficient

ABSTRACT

The main focus of the study was to determine constraints faced by the farmers in IPM practices in rice cultivation and to explore the relationships between the constraints faced by the farmers in IPM practices and their selected characteristics. The study was conducted at Ratanpur and Sreerampur unions of Nabinagar Upazila under Brahmanbaria District. Data were collected from 107 rice farmers who were proportionate randomly selected as the sample of the study from an update list of 1534 rice farmers that was prepared with the help of Sub-Assistant Agriculture Officers of the study area. The researcher himself collected data through personal contact with a well structured pretested interview schedule during the period from 10 June to 10 July, 2013. The study revealed that the highest proportion (75.70 percent) of the respondents faced medium constraints in IPM practices, while the 17.76 percent of the respondents confronted high constraint and the rest 6.54 percent of the respondents faced low constraints in IPM practices. Pearson's Product Moment Correlation co-efficient (r) was computed to explore the relationships between the constraints faced in IPM practices by the farmers and their ten selected characteristics. The correlation analysis indicated that, education, training received in IPM practices, extension media contact, cosmopolitaness and knowledge on IPM of the rice farmers had significant negative relationships with their constraints faced in IPM practices. On the other hand, age, total family members, rice cultivation area, annual family income and agricultural experience of them had no significant relationships with the constraints faced in IPM practices. Finally, a constraint faced index (CFI) was made of twelve selected constraints among which the constraints, "lack of technical knowledge in IPM practices" followed by "lack of technical support in IPM practices" and "unavailability of inputs of IPM practices".

CHAPTER 1

INTRODUCTION

Sher-e-Bangla Agricultural University
Library
Accession No. 38703
Sign: *msu* Date: 2.12.14

1.1 General Background

Agriculture is the backbone of Bangladesh economy, which contributes 19.29 percent to the country's Gross Domestic Product (GDP). About 60 percent of the country's total population is directly or indirectly dependent on agriculture for their livelihood. More than 48.1 percent of the national labor force is employed in agriculture sector (BBS, 2012).

Within the crop sub-sector food grains, particularly the rice crop dominates in respect of both area and production. At present, rice covers about 75 percent of the cultivated land in Bangladesh. Thus, growth of rice crop has got substantial impact on the sectoral performance of agriculture. Although there has been an increase in the food grain production in past few years, the country has to further increase its food grain production on a sustainable basis to feed the ever increasing population.

One of the main constraints to increasing crop production is the pests. The word 'pest' refers to organisms such as insects, pathogens, weeds, nematodes, mites, rodents and birds that cause damage or annoyance to man, his animals, crops or possessions. According to an estimate, annual yield loss due to insect pest alone is 16 percent for rice, 11 percent for wheat, 16 percent for sugarcane, 20 percent for vegetables, 12 percent for jute and 18 percent for pulse crops (MOA, 2011).

Integrated Pest Management (IPM) is an effective and environment-friendly pest management system. It is an ecological approach to pest management in which all available effective techniques are deployed in a unified program so that the pest

populations can be managed to avoid economic damage and minimize adverse side effects. A set of decision-making tools is utilized to implement IPM at the farmers' level. This approach to rice production in the Philippines was centered for optimizing farmers' returns on investment for pest control while minimizing hazards to health and environment quality (Kenmore, 1991). In this aspect, farmers design their own cropping pattern to reduce available food resources for the pest, planting variety resistant to locally important pests, preparing land and managing fertilizer in an efficient and profitable manner, regular monitoring and estimating pest abundance and applying pesticides in a safe, minimally disruptive and highly profitable fashion. In Farmers' Field School (FFS), integrated pest management has been given the top most priority as a learning topic for rural farmers. Being educated through Farmers' Field School on IPM, farmers are supposed to use alternate means of pesticide to pest management in their field. In a study, Ramasswamy (1992) found that out of 2950 farmers, 59 farmers after receiving FFS training reduced pesticide use by 80%, saving 70% of their pesticide cost. The farmers who produced 3.55 tons of paddy/ha before receiving IPM training produced 4.79 tons/ha after IPM training, effecting on yield increase of 35%. Similarly, rice yield increased by 4% bringing over 20% increase in profit due to FFS training in Vietnam (Kenmore, 1997).

The concept of IPM is not new. In Bangladesh, IPM activity was started in 1981 on small scale basis. In 1989, some trust was given on IPM through FAO's inter-country program. Based on success of FAO's inter-country program, IPM activities were undertaken by the Department of Agricultural Extension (DAE) IPM through DAE-DANIDA-SPPS, DAE-UNDP/FAO and DAE-CAD project. DANIDA-SPPS was a five year program starting from July 1997 (Anonymous, 1999). Presently, the Government of Bangladesh started IPM project from January

2001 for High Value Crop in northwest districts of Bangladesh (Anonymous, 2001). As IPM program is being implemented at the field level, the farmers are likely be encouraged by certain factors that motivate them for IPM practice in their fields. Similarly, there might also be certain factors which discouraged the farmers in IPM practices in rice cultivation.

1.2 Statement of the Problem

In the past, pesticides were considered as the ‘panacea’ for the control of agricultural pests. Although pesticides may provide temporary relief, it is now widely accepted that indiscriminate and excessive use of pesticides and the long-term dependency on them threaten the sustainability of agricultural production. Over dependence on chemical pesticides is not only expensive but also leads to negative environmental impacts, increase health hazards to both the growers and consumers of crops. So, there is a need for an alternative method rather than to rely solely on pesticides. Integrated Pest Management (IPM) has now been considered as the most appropriate one in this respect.

Although rice farming has developed substantially, many farmers in Bangladesh still cultivate rice crops in order to ensure their food production for subsistence. Use of IPM practices in rice cultivation can totally avoid the use of pesticides. But in reality it becomes difficult for them to take risk in avoiding the use of pesticides. In other words, IPM is a consecutive technique of works where farmers have to maintain all activities and qualities from seed selection to packaging or storing of rice. So, it is difficult to the rice farmers to maintain all practices of IPM in their rice cultivation.

Considering the above facts in view, it is necessary to undertake a research study entitled “**Constraints Faced by the Farmers in IPM Practices in Rice Cultivation at Nabinagar Upazila under Brahmanbaria District**”. In light of above discussion and the background information, the present study has been undertaken with the following research questions:

1. What are the farmers’ characteristics that are related to constraints faced in IPM practices in rice cultivation?
2. What are the extents of constraints faced by the farmers in IPM practices in rice cultivation?
3. Are there any relationships between the constraints faced by the farmers in IPM practices in rice cultivation and their selected characteristics?

1.3 Specific Objectives of the Study

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

1. To determine and describe the following selected characteristics of the rice farmers:
 - (i) Age
 - (ii) Education
 - (iii) Total family members
 - (iv) Rice cultivation area
 - (v) Training received in IPM practices
 - (vi) Annual family income
 - (vii) Extension media contact
 - (viii) Agricultural Experience
 - (ix) Cosmopolitaness
 - (x) Knowledge on IPM

2. To determine the extent of constraints faced by the farmers in IPM practices in rice cultivation
3. To explore the relationship between the constraints faced by the farmers in IPM practices in rice cultivation and their selected characteristics
4. To compare the severity of the constraints faced by the farmers in IPM practices

1.4 Justification and Scope of the Study:

Agriculture and environment has an in-built relationship. If we want to increase agricultural production we have to keep the environment healthy and friendly. Integrated Pest Management (IPM) is an appropriate package of technology in crop cultivation which is economical and non-hazardous to the environment. At present situation rice farmers have been playing a great responsibility, which is to produce a huge amount of rice to meet the increasing populations' demand from the declining size of cultivable land as because rice is our staple food. For this purpose farmers are using various chemical fertilizers and pesticides extensively in their rice fields. Rapid applications of these chemicals are severely hazardous for soil fertility and the environment as well as for the human health. And it is one of the main causes for increasing the cost of production of rice. For this reason many farmers are losing their interest in rice production. They are migrating for the crops which give high returns. So, at this point IPM practice in rice cultivation for all the farmers is a crucial need. IPM practice also helps to increase soil fertility, reduce the cost of production and it is totally eco-friendly.

Every endeavor has some constraints. IPM practice is not exceptions. Besides, it is integrated of serial activities from seed selection to post harvest management. So, constraints faced by the farmers in using IPM practices are practical. As

practicing IPM in rice fields is time demanding and very in need in the country, reducing the constraints of the farmers regarding this aspect is top most priority. The foregoing discussions enable one to believe that incorporation of constraints faced by the farmers in IPM practices in rice cultivation in development effort may help to reach rice and other crop protection abilities. This gives rise to the necessity of identification, documentation and evaluation of the indigenous technologies used by the farmers in Bangladesh.

A scientific analysis for successful identification of the constraints faced in IPM practices and an understanding of the phenomena related to the objectives of the study, the researcher believes may be invaluable document to various government, autonomous, and non-government organizations to plan, organize and generate appropriate technologies for crop protection. Although the findings of this study will, be applicable to Rotonpur and Sreerampur unions of Nabinagar Upazila under Brahmanbaria District, it is expected that the findings may also have applicable to other areas of Bangladesh were the physical, socio-economic, and other cultural conditions do not differ much from those of the study area. The findings of the study are also expected to have bearing to the Department of Agricultural Extension (DAE) to reorganize its existing programs in the light of the concept of crop protection. Lastly, the researcher hopes that the outputs of this study would stimulate further research on indigenous farm practices of farmers that has been the least-explored territory in the field of agricultural extension research in Bangladesh so far and which, in turn, can lead support to grow interest of the researchers to try-out the feasibility/prospect of further studies in connection with crop protection in the country.

1.5 Assumptions of the Study

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

- i. The respondents selected for the study were capable to provide proper responses to the questions included in the instrument.
- ii. The responses furnished by the respondents were reliable. They expressed the truth about their convictions and awareness.
- iii. Views and opinions furnished by the respondents included in the sample were the representative views and opinions of the whole population of the study area.
- iv. 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.
- v. The environmental conditions of the farmers were deemed more or less similar throughout the study area.
- vi. The nature of problems gave a representative feature in the context of the other rural areas of Bangladesh.

1.6 Limitations of the Study

Considering the time, money and other necessary resources available to make the study manageable and meaningful, it was necessary to consider the following limitations:

1. The study was confined two unions namely, Rotonpur and Sreerampur of Nabinagar Upazila under Brahmanbaria District.
2. There were many farmers in the study area, but only the farmers who were involved in rice cultivation were considered for this study.

3. Characteristics of the farmers were many and varied but only nine characteristics were selected for investigation in this study.
4. There are many constraints which may arise in agricultural activities. But, only some selected constraints have been taken into consideration.
5. During data collection the researcher had to depend on data furnished by the respondents. As none of the farmers kept records of their farming activities, they furnished information to the different questions by recall.
6. Conceptually, constraints faced by the farmers were determined from their statements.
7. Constraints of the farmers could be measured in various ways. However in this study these were measured by using some specific point rating scale.
8. The present study highlights a new dimension of research in the field of agricultural extension in Bangladesh and so the researcher could not provide sufficient evidence in equipping his study report with relevant literature reviews.

1.7 Definition of Key Term

Certain terms have been used in this research which are defined and interpreted as follows for clarity of understanding:

Constraint: A state of difficulty that needs to be resolved. A matter or situation regarded as unwelcome or harmful and needing to be dealt with and overcome.

Farmers: The persons who were involved in farming activities are called farmers. They participated in different farm and community level activities like crops, livestock, fisheries, other farming activities etc.

Assumption: An assumption is “The supposition that an apparent fact or principle is true in the light of the available evidence” (Goode and Hatt, 1952).



Hypothesis: Defined by Goode and Hatt (1952), a proposition this can be put to “a test to determine its validity”. It may be true or false, it may seem contrary to or in accord with common sense. However, it leads to an empirical test.

Null hypothesis: The hypothesis which we pick for statistical test is null hypothesis (Ho). In this study the null hypothesis is stated that there is no relationship between the concerned variables.

Age: It refers to the time from the date of birth to the date of interview counted of respondent.

Education: Empirically it was defined to the development of desirable changes in knowledge, skill and attitudes in an individual through reading, writing, walking, observation and other selected activities. It was measured on the basis of classes a farmer has passed from a formal educational institution.

Total family members: Total family members of a family were defined as the number of individuals in his family including himself, his wife, children and other dependent members.

Rice cultivation area: The term related to the hectare of land of a farmer on which he carried his rice cultivation, the area being estimated in terms of full or partial benefit to the farmer.

Training received in IPM practices: It referred to the total number of days that a respondent attended in training programs regarding IPM practices conducted by different organizations in his entire life.

Annual family income: It refers to the gross income in thousand taka gained annually from crop, livestock, fisheries and various sources (service, landed

property, business etc.) by the farmer or his parents and other members of the respondent.

Extension media contact: Extension media contact referred to the channel through which various information are diffused among the farmers who become informed about different aspects of agricultural activities.

Agricultural experience: The term expressed in years a farmer has been involved in agricultural farm practices.

Cosmopolitaness: The term cosmopolitaness of a farmer refers to the frequency of visit different places and external to and outside of his own social system.

Knowledge on IPM: It is the extent of basic understanding of the farmers in different aspects of IPM practices like soil, seed, fertilizers, insect pests and diseases, high yielding varieties etc. It includes the basic understanding of the use of different inputs and practices of IPM.

Constraints faced in IPM practices: Constraints faced in IPM practices refers to different constraints confronted by the farmers in practicing the IPM system. In other words, constraints faced in IPM practices are the consciousness of difficulties faced by a participating farmer regarding that aspect.

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this study was to have an understanding of constraints faced by the farmers in IPM practices and exploring the relationship with their selected characteristics. An effort was made to review the findings of past researches in this respect. Accordingly, the researcher made an exhaustive search of past studies that could be made available. But unfortunately very few of these studies were related to the study of constraints faced by the farmers in their rice cultivation. This chapter comprises of three sections as follows:

2.1 Constraints faced by the farmers in different agricultural aspects

Rahman (2008) conducted a study on agricultural problem confrontation by the charland farmers of Jamuna River. Top five identified problems according to their rank order were: (i) Flood or cyclone, (ii) Lack of market facilities (for sales, surplus products, and purchase), (iii) Lack of academic opportunity (school/college), (iv) Lack of recreation facilities and (v) Lack of cooperative activities.

Uddin (2004) in his study identified five aspect of problems in commercial cultivation of vegetables viz. seed problems, disease and insect infestation problems, field management problems, marketing of vegetable problems and extension work problems. Among these aspects of problems he revealed disease and pest infestation problems severely confrontation of the farmers.

Halim (2003) conducted a study on problems confrontation of the farmers in adopting crop diversification. The top five problems identified of this study according to their rank order were (i) lack of storage facilities for products and seeds. (ii) high price of inputs, (iii) non-availability of credit for other crops, (iv)

lack of sufficient training programme in different aspects of crop diversification and (v) most of the lands are in low lying areas and not suitable for CDP crops.

Salam (2003) in his study identified problems in adopting environmentally friendly farming practices. Top six identified problems according to their rank order were: (i) low production due to limited use of fertilizer (ii) lack of organic matter in soil, (iii) lack of Govt. support for environmentally friendly farming practices, (iv) lack of capital and natural resources for integrated farming practices, (v) lack of knowledge on integrated farm management and (vi) unavailability of pest resistant varieties of crops.

Chander and Singh (2003) in their study identified four aspects of problems in adoption of IMP practices viz. technological problems, economical problems, services, supply and marketing problems and transfer of technology problems. They also opined that economical problems confrontation of the farmers at “most serious” level.

Agnew *et al.* (2002) found that the adoption of Harvesting Based Practice (HBP) (specifically, lower pour rite and lower extractor fan speed balanced against harvest time) can provide an extra \$100/ha to the industry. Several barriers to adoption of HBP have slowed progress. These include low sugar prices, wet weather, orange rust disease, system of harvester payment, insufficient cane quality feedback mechanisms and physical, time and safety upon harvesting.

Pramanik (2001) made an extensive, study on the twenty-four problems of farm youth in Mymensingh villages relating to different problems in crop cultivation. Out of twenty-four problems tile top four problems in rank order were: (i) local NGO take high rate of interest against a loan, (ii) lack of agricultural machinery

and tools, (iii) lack of cash and (iv) financial inability to, arrange improved seeds, fertilizers and irrigation.

Ismail (2001) conducted a study on farm youth of haor area of Mohangonj upazila. Study revealed that six top problems in rank order were (1) no arrangement of loan for the farm youth for fishery cultivation, (ii) lack of government programmes in agriculture for the farm youth, (iii) absence of loan giving agencies for establishing agricultural farm, (iv) general people face problem for fishery due to government leasing of Jalmohal, lack of government programmes for establishing poultry farm, (vi) lack of agricultural loan for the farm youth.

Faroque (1997) found that female rural youth in Bhaluka (Mymensingh) lacked cash for buying seeds, seedling and fisheries and deprived of necessary knowledge in improved vegetable cultivation. He further added that the majority of female rural youth confrontation very high (74%) problems.

Kumar *et al.* (1995) showed that the economics of improved management practices, extent of adoption of seven improved management activities by crop, and investigates major problems to adoption. The sample consisted of 25 farmers from all adopted village for technology transfer and 25 farmers from non-adopted villages. Adoption of improved management practices, though cost intensive, provided higher yield and income levels than traditional farming practices. The level of adoption of improved management practices was higher in the adopted village than the non-adopted village. High input prices and low market prices for output were the major problems experienced by farmers in both adopted and non-adopted villages.

Rahman (1995) in his study, identified farmers' confrontation 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 farmers in Mymensingh district.

Shehrawant and Sharma (1994) found that the Indian rural youths were suffering serious economic problems and difficulty in obtaining loans from banks and other agencies. They further added that the youth confrontation uncertainty about the access of field crops, less price of produced crops.

Freeman and Breth (1994) conducted a study on issues in African Rural Development Study showed several problems in farming practices such as intensified land use, fallow periods decline and crop cultivation spreads into marginal or ecologically fragile lands. In the absence of appropriate resource management technologies, these practices inevitably lead, to degradation of the resource base with important implications for soil productivity, household food security and rural poverty.

Gumisiriza *et al.* (1994) showed several problems, (traditional fanning practices, unavailability or lack of improved cultivars, information and technology transfer, rusts and foliar disease ineffective communication between research stations and research priorities in Uganda).

Akanda (1993) conducted a research to find out problem confrontation of the farmers in cultivating Mukta (BR11) rice in transplanted aman season. The

problem confrontation of the farmers was measured in three aspects of Mukta rice cultivation viz. (a) using quality seed (b) using recommended fertilizers (c) taking plant protection measures. The findings revealed that, (a) in using quality seed majority of the farmers (72.38 percent) had medium problem confrontation compared to 22.86 percent having low problem confrontation and only 4 percent high problem confrontation, (b) in using recommended fertilizers the highest portion (88.57 percent) of the farmers belong to medium problem confrontation category, compared to 29.52 percent having low and only one percent high problem confrontation and (c) in taking plant protection measures the highest portion of the farmers (80.95 percent) had high problem confrontation, while 16.19 percent had medium and only 2.66 percent low problem confrontation.

Ramachandran and Sripal (1990) identified different problems in adoption of dry land technology for rainfed cotton in Kainaraj district, Tamilnadu, India. They found that farmers' confrontation problems were insufficient rainfall, susceptibility of pest and diseases, lack of experience, presence of modern plants, chemicals not available in time, lack of knowledge, insufficient livestock, risk due to failure of monsoon, high cost etc.

Raha *et al.* (1986) identified some common problems of cotton cultivation as perceived by the farmers in Bangladesh. Those were: lack of suitable land, lack of irrigation facilities, shortage of labour, shortage of cash money, lack of technical knowledge, lower price of cotton, and non-availability of seed, insecticides and fertilizers. production technology were all irregular and insufficient electricity supply, small size of holding for green manuring, intercrops not convenient due to weeds, high cost of farm fuel, scarce irrigation facilities, absence of location

specific recommendations for earthing up, lack of drought resistant varieties and lack of technical knowledge about plant protection and chemical fertilizers.

Arya and Shah (1984) conducted a study in the mid-Himalayan region of Uttar Pradesh of India to find out the existing and potential level of food production and the main problems on the adoption of new technology for rainfed agriculture. The main findings were (i) small and skewedly distributed holdings; (ii) fragmented and scattered holdings; (iii) shortage of labour; (iv) lack of availability of inputs and funds; (v) lack of education, extension and training especially for women.

Marothia (1983) conducted a research to find out the problems in the adoption of paddy technologies in two villages in Raipur Block, Madhya Pradesh, India. The findings revealed that the majority of farmers still adopt a partial package of recommendations, mainly due to the high cost of inputs, financial limitations and risk of crop failure. Inadequate supportive input-facilities were found to be responsible for the slow adoption a paddy technology.

2.2 Review of past studies on the relationship between the selected characteristics of the farmers and constraints faced in IPM practices

2.2.1 Age and constraints faced

Alam (2008) found that age of the farmers had no significant but negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Rahman (2008) found that age of the charland farmers had no significant relationship with agricultural problem confrontation by char land farmers of Jamuna River.

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

Bhuiyan (2002) in his study found a positive and significant relationship between age of the farmers and their problem in banana cultivation. A similar finding was obtained by Haque (1995) and Rahman (1996) in their respective study.

Hossain (1985) 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. Similar findings were obtained by Rahman (1995), Rashid (1999), Pramanik (2001), Ahmed (2002), Hossain (2002), Salam (2003) and Halim (2003) in their respective studies.

Mansur (1989) found that age of the farmers had no significant relationship with the feeds and feeding problem confrontation.

2.2.2 Education and constraints faced

Alam (2008) found that education of the farmers had significant negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Rahman (2008) found that education of the charland farmers had significant negative relationship with agricultural problem confrontation by char land farmers of Jamuna River.

Hasan (2005) in his study found that there was no relationship between education of the farmers and their problem confrontation in crop production activities.

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

Haque (1995) in his study on problem confrontation of the farmers of Mohila Bittaheen Samabaya Samittee working under the Bangladesh Rural Development Board found a significant negative relationship between education of members and their problem confrontation. Similar findings were obtained by Mansur (1989), Rahman (1995), Rahman (1996), Faroque (1997), Pramanik (2001).

2.2.3 Total family members and constraints faced

Alam (2008) found that family size of the farmers had no significant relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Hasan (2005) in his study found that there was no relationship between family size of the farmers and their problem confrontation in crop production activities.

Uddin (2004) found that family size of the farmers was negatively related with their constraints. Alam (2003) found similar result in his study.

Karmakar (2004) observed statistically insignificant relationship between family size and their constraints in adopting aquaculture technologies.

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

Hoque (2001) revealed that significant positive relationship between family size and problem confrontation of the FFS farmers in practicing IPM.

. Bhuyian (2002) and Salam (2003) found similar result in their respective studies.

Rahman (1995) found that family size of the farmer's had a significant negative relationship with their problem confrontation in cotton cultivation. Similar findings were obtained by Islam (1987), Mansur (1989), Rahman (1996), Faroque (1997), Ismail (2001), Ahmed (2002) and Halim (2003) in their respective studies.

2.2.4 Rice cultivation area and constraints faced

Alam, (2008) found that farm size of the farmers had significant negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Hasan (2005) in his study found that there was no relationship between farm size of the farmers and their problem confrontation in crop production activities.

Uddin (2004) found that farm size of the farmers was negatively related with their constraints. Alam (2003) found similar result in his study.

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

2.2.5 Training received in IPM practices and constraints faced

Alam (2008) found that farm size of the farmers had significant negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Akanda (2005) found that training experience of the farmers had significant negative relationship with technological gap in transplanted modern rice cultivation at farmers' level.

2.2.6 Annual family income and constraints faced

Alam (2008) found that annual income of the farmers had significant negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Rahman (2008) found that family annual income of the charland farmers had significant negative relationship with agricultural problem confrontation by char land farmers of Jamuna River.

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

Mansur (1989) in his study found that the relationship between income of the farmers and their problem confrontation in feeds and feeding cattle was significant but showed a negative trend.

Rahman (1995) found in his study that annual family income of the farmers had a significant negative effect on their problem confrontation in pineapple cultivation.

Karim (1996) found in his study that annual family income of the farmers had a significant negative effect on their problem confrontation in kakrol cultivation.

Saha (1983) found in his study a negative relationship between income of the farmers and their poultry problem confrontation.

2.2.7 Extension media contact and constraints faced

Alam (2008) found that extension contact of the farmers had significant negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Rahman (2008) in his study found that extension contact of the charland farmers had significant negative relationship with agricultural problem confrontation by char land farmers of Jamuna River.

Hasan (2005) in his study found that there was no relationship between extension contact of the farmers and their problem confrontation in crop production activities.

Rahman (1995) in his study conducted that extension contact of the farmer had significant negative relationship with their problem confrontation in cotton cultivation. Similar findings were obtained by Rahman (1996), Faroque (1997), Pramanik (2001), Hossain (2002), Bhuiyan (2002), Ahmed (2002), Salam (2003) and Halim (2003) their respective studies.

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

2.2.8 Agricultural Experience and constraints faced

Rahman (2008) in his study found that experience in agricultural practice of the charland farmers had no significant negative relationship with agricultural problem confrontation by char land farmers of Jamuna River.

2.2.9 Cosmopolitaness and constraints faced

Alam (2008) found that cosmopolitaness of the farmers had no significant but negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Kashem (1977) found that there was no significant relationship between cosmopolitanism of the landless labourers, but existed a negative trend between the two variables.

Rashid (1975) found that there was a negative relationship between cosmopolitanism of the farmers and their agricultural problem confrontation.

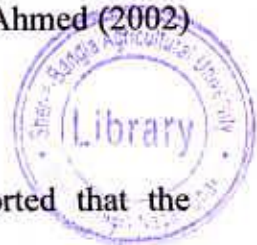
2.2.10 Knowledge on IPM and constraints faced

Alam (2008) found that knowledge on IPM of the farmers had significant negative relationship with constraints analysis in adoption of IPM practices in rice cultivation.

Ali (1999) in his study revealed that knowledge of the rural youth had significant positive relationship with their anticipated problem confrontation in self employment by undertaking selected income generating activities.

Mansur (1989) found in his study that there was a substantial significant negative relationship between knowledge in feeds and feeding cattle of the farmer and their problem confrontation in feeds and feeding. Similar findings were obtained by Sarker (1983), Rahman (1996), Hoque (2001), Hossain (2002) and Ahmed (2002) in their respective studies.

Raha (1983) in a study on poultry problem confrontation reported that the relationship between poultry knowledge and poultry problem confrontation was negative. He reported from his study that farmer's knowledge in irrigation of modern boro rice had no significant relationship with their irrigation problem confrontation. Anwar (1994), Karim (1996), Rashid (1999), Ismail (2001), Salam (2003), and Rashid (2003) found similar findings in their respective studies.



2.3 Conceptual Framework of the study

This study is concerned with the farmers' constraints faced in IPM practices in their rice cultivation. Thus, constraint faced in IPM practices was the main focus of the study and ten selected characteristics of the farmers were considered for the study. Constraints faced in IPM practices in the rice cultivation of an individual may be affected through interacting forces of many characteristics of the farmers. It is not possible to deal with all characteristics in a single study. It was therefore, necessary to limit the characteristics, which include: age, education, total family members, rice cultivation area, training received in IPM practices, annual family income, extension media contact, agricultural experience, cosmopolitaness and knowledge on IPM.

Again, in order to have a clear understanding of the nature of farmers' constraint, the dependent variable was considered from the view of several numbers of dimensions of constraints. These dimensions included: (1) Doubt about the effectiveness of IPM practices, (2) Lack of technical knowledge in IPM practices, (3) Lack of technical support in IPM practices, (4) Unavailability of inputs of IPM practices, (5) High cost of inputs of IPM practices, (6) Lack of eagerness to use of IPM practices, (7) Surrounding farmers are not interested towards IPM practices, (8) Lack of demonstration plot, (9) Require more labor than chemical pesticide treatments, (10) Lack of knowledge and awareness about soil fertility and environmental pollution, (11) Availability of chemical pesticides in local market and (12) Lack of knowledge about beneficiaries and harmful insects and pests. Considering the above discussion, a conceptual framework has been developed for this study, which is diagrammatically presented in the following Figure 2.1.

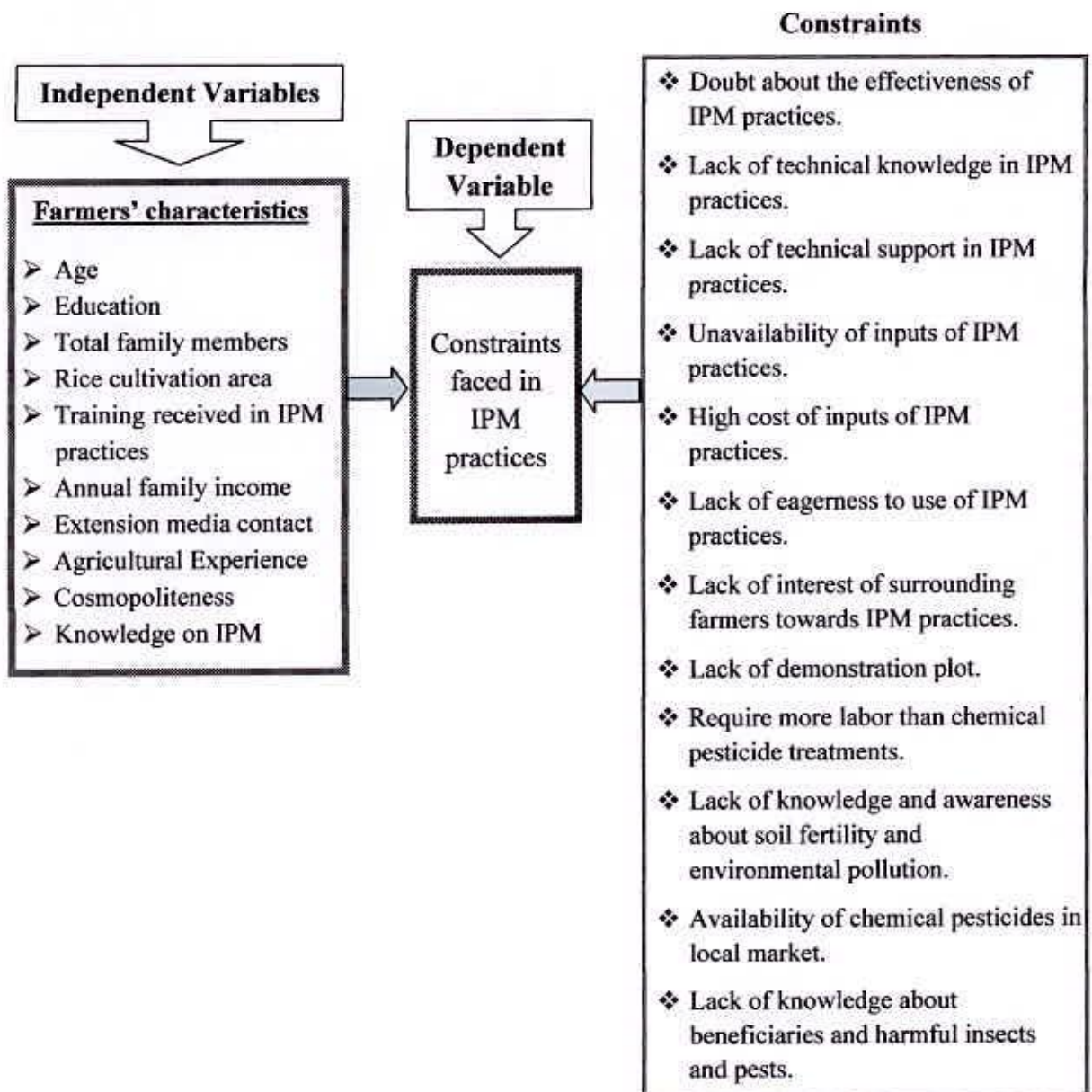


Figure 2.1 Conceptual framework of the study

CHAPTER 3

METHODOLOGY

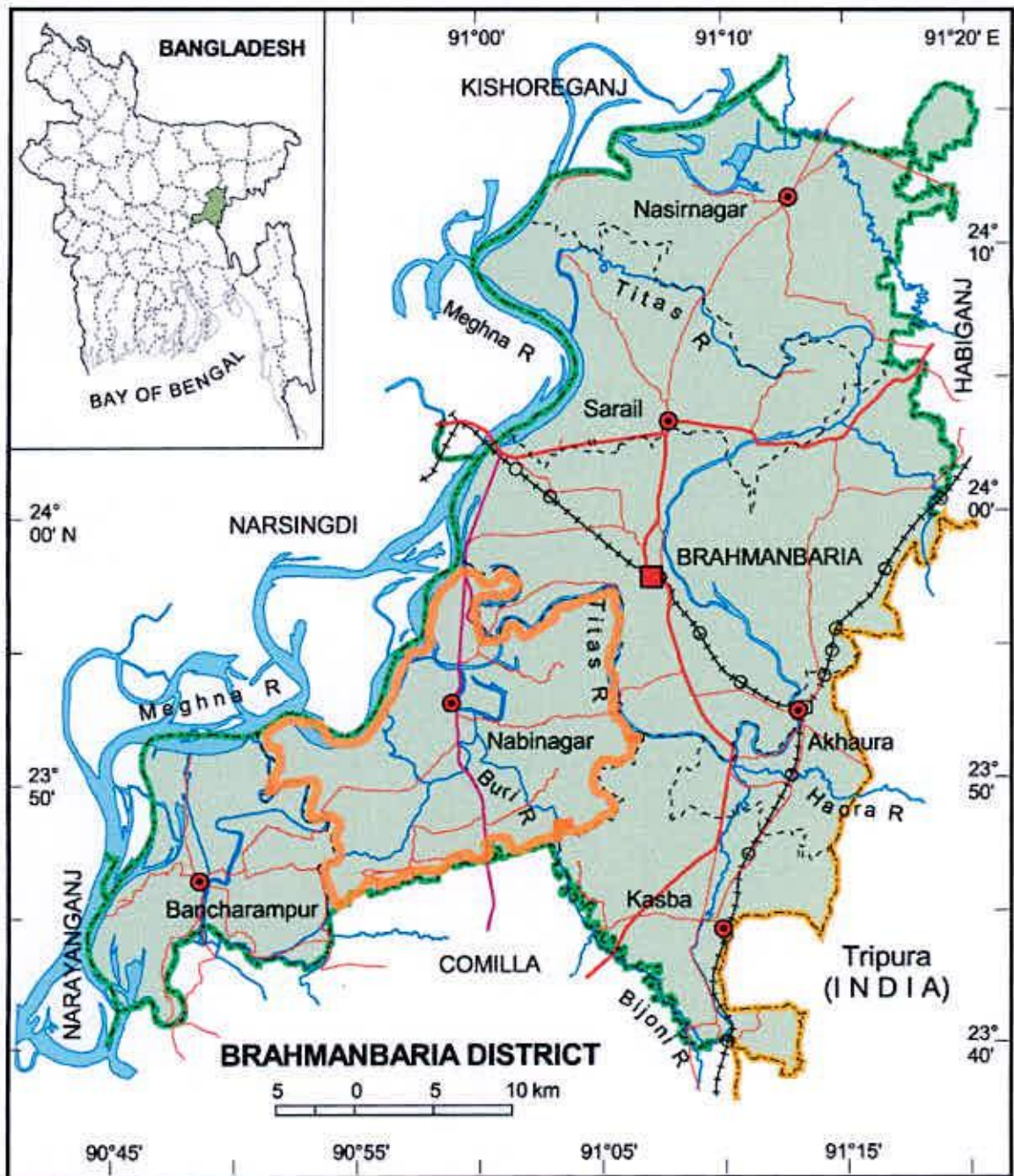
Importance of methodology for conducting any research can hardly be overemphasized. Keeping this point in view, the researcher took great care for the use of proper methods in all aspects of investigation. Methods and procedures followed in this study are discussed in this chapter.

3.1 Locale of the Study

38703
Considering time and budget the study was conducted in four villages namely, Rotonpur and Mulla villages from Rotonpur union and Vholchong and Gopalpur villages from Sreerampur union of Nabinagar Upazila under Brahmanbaria District. The villages from the unions and unions from the Upazila were selected using the random sampling method. These unions are situated in 20km and 10km north-east from Nabinagar Upazila head quarters. Farmers of these areas cultivate rice mainly. As the area is familiar for rice cultivation and no previous study was conducted in this area on farmers' constraints faced regarding IPM practices, to bring the area in the light of nations' concern it was selected as the locale of the study. Maps of Brahmanbaria District and Nabinagar Upazila showing the study areas are presented in Figures 3.1 and 3.2 respectively.

3.2 Population and Sample

Rice farmers of selected four villages constituted the population of the study. An update list of 1534 rice farmers from the selected villages was prepared with the help of Sub-Assistant Agricultural Officers of the study areas. Seven (7) percent of the populations were proportionately and randomly selected as the sample of the study by using random sampling method. Thus, 107 rice farmers constituted the sample of the study.



Source: <http://zesun35geo.webs.com/DISTRICTS%20MAPS/BRAHMANBARIA%20DISTRICT.GIF>

Figure 3.1 Map of Brahmanbaria District showing Nabinagar Upazilla



Source: <http://bangladesh-maps.blogspot.com/2012/03/Nabinagar-upazila-map-of-Nabinagar.html>

Figure 3.2 Map of Nabinagar Upazilla Showing the Study Area

A reserve list of 12 rice farmers was also prepared by the same method so that the respondents of this list could be used for interview if the respondents included in the original sample were not available at the time of data collection. The distribution of the population sample and number of rice farmers in the reserve list are given in Table 3.1.

Table 3.1 Distribution of the sample population and number of rice farmers in the reserve list

Name of the of villages	No. of rice farmers	No. of rice farmers included in the sample	No. of rice farmers in the reserve list
Rotonpur	397	28	3
Mulla	433	30	3
Gopalpur	336	23	3
Vholchong	368	26	3
Total	1534	107	12

3.3 The Research Instrument

A well structured interview schedule was developed based on objectives of the study for collecting information. An interview schedule was constructed containing direct and simple questions in open form and close form. Appropriate scales were developed to measure the variables of the study.

The interview schedule was pre-tested among ten rice cultivators in actual situation to determine the validity of the exerted questions. Necessary corrections, additions, alternations, rearrangements and adjustments were made in the interview schedule based on pretest experience. Then the final draft of interview schedule was prepared. Afterward it was multiplied by printing in its final form. An English version of the interview schedule is presented in Appendix-A.

3.4 Measurement of Variables

The variable is a character, which can assume varying, or different values in successive individual cases. In the scientific research, the selection and measurement of variable constitute a significant task. Following this conception, the researcher reviewed literature to widen this understanding about the natures and scopes of the variables relevant to this research. At last the researcher had selected constraints faced in IPM practices as the main focus of the study. Ten of the characteristics of the farmers such as: age, education, total family members, rice cultivation area, training received in IPM practices, annual family income, extension media contact, agricultural experience, cosmopolitaness and knowledge on IPM were considered for the study which might have relationship with their constraints faced in IPM practices. The methods and procedures in measuring these variables are presented below:

3.4.1 Measurement of Selected Characteristics of the Farmers

The following procedures were followed for measuring the selected characteristics of the rice farmers:

3.4.1.1 Age

Age of a farmer was measured in terms of actual years from his/her birth to the time of interview. A score of one (1) was assigned for each year of age. No fraction of year was considered. If a respondent was 45 years old, his/her age score was assigned as 45.

3.4.1.2 Education

Education was measured in terms of grades of education (school/college) completed by an individual. It was expressed in terms of year of successful schooling. A score of one (1) was assigned for each year of successful schooling

completed. For example, if a respondent passed the H.S.C. examination, his/her education score was given as 12, if s/he passed the final examination of class five, his/her score of educational level was given as 5. If a respondent did not know how to read and write, his/her score of educational level was given as '0' (zero). A score of 0.5 (half) was given to that respondent who could sign his name only.

3.4.1.3 Total family members

Total family members of an individual were measured in terms of counting total number of members of his/her family. A score of one (1) was assigned for each member. For example, if a respondent's family had four members the score was assigned as 4, if the family had six members its score was assigned as 6.

3.4.1.4 Rice cultivation area

Rice cultivation area of a respondent referred to the total area of land on which he/she cultivates rice in the last year. It was expressed in hectares for each respondent. The data were first recorded in terms of local unit i.e; *bigha, katha or pakhi* and then were converted to hectare.

3.4.1.5 Training received in IPM practices

Training received in IPM practices score of a respondent farmer was obtained by the number of days that a respondent had received training on IPM practice in his or her entire life. A score of one (1) was assigned for each day of training attended. If a farmer received 3 days training, his/her training score was given 3.

3.4.1.6 Annual family income

Annual 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 members of his/her family. For calculation of income score, one (1) score was assigned for one thousand taka.

3.4.1.7 Extension media contact

The extension media contact of the respondent farmers was measured on the basis of their extent of contact with the selected media in receiving IPM practices information in rice cultivation during the immediate past year. Ten (10) extension media were considered for this study. A five point scale was used to compute the score of extension media contact. In this regard weight was assigned to each of the five types of responses provided by the respondent farmers in the following manner:

<u>Responses</u>	<u>Weight</u>
Regularly	4
Frequently	3
Occasionally	2
Rarely	1
Not at all	0

Logical frequencies were considered for each alternative responses for each item. Then the extension media contact score of a respondent for the ten selected extension media contact were added together to ascertain his/her total score of extension media contact. Thus, the extension media contact score of a respondent could range from '0' to 40 where '0' indicated no extension media contact and 40 indicated highest extension media contact.

3.4.1.8 Agricultural experience

Agricultural experience of a respondent was measured by the period of time from when s/he started to agricultural farm practices to the time of interview and it was measured in terms of completed years on the basis of their responses. A score of one (1) was assigned for each year of cultivation.

3.4.1.9 Cosmopolitaness

Cosmopolitaness of a respondent was measured in terms of his/her nature of visits to the nine different places external to his own social system. The scale used for computing the cosmopolitaness score was presented below:

Frequency of visit	Assigned score
Regularly	4
Oftenly	3
Occasionally	2
Rarely	1
Not at all	0

The cosmopolitaness score of a respondent was determined by adding together the scores obtained from visit to each of the *ten* (10) types of places. The cosmopolitaness score of the respondents could range from 0 to 40, where, 0 indicating no cosmopolitaness and 40 indicating very high cosmopolitaness.

3.4.1.10 Knowledge on IPM

Knowledge on IPM referred to the knowledge gained by the farmers in IPM practices. Eighteen questions on different aspects of IPM were asked to the rice farmers to ascertain their knowledge score. The score was assigned as 2 for full correct answer and zero (0) for incorrect or no answer for each question. Partial score was assigned for partial correct answer. Thus, the knowledge scores of the respondents could range from '0' to 36 where zero (0) indicated very low and 36 indicated very high knowledge on IPM.

3.4.2.1 Measurement of constraints faced in IPM practices

The procedure for measuring the constraints faced in IPM practices by the farmers in rice cultivation was as follows:

The researcher generalized the constraints faced in IPM practices in twelve different statements. A five point rating scale was used to determine the extent of each constraint by the following scores:

Extent of the constrains	Assigned score
High constraint	4
Medium constraint	3
Low constraint	2
Very low constraint	1
Not at all	0

The constraints score of a farmer was computed by adding all scores obtained by him/her on 12 selected items. Thus total score of constraints faced by a farmer could range from '0' to 48, while '0' indicated no constraint and 48 indicated highest constraints faced in IPM practices.

3.4.2.2 Constraints Faced Index (CFI):

For clearer understanding of constraints of farmers, Constraints Faced Index (CFI) for each item was computed by using the following formula:

$$\text{Constraints Faced Index (CFI)} = C_h \times 4 + C_m \times 3 + C_l \times 2 + C_v \times 1 + C_n \times 0$$

Where,

C_h = Percentage of farmers confronted high constraint in following IPM practices

C_m = Percentage of farmers confronted medium constraint in following IPM practices

C_l = Percentage of farmers confronted low constraint in following IPM practices

C_v = Percentage of farmers confronted very low constraint in following IPM practices

C_n = Percentage of farmers confronted no constraint in following IPM practices

Constraints Faced Index (CFI) for each of the selected 12 items could range from "0" to 400, where "0" indicated no constraints faced and 400 indicated highest constraints faced.

3.5 Hypothesis of the Study

In the present study the following null hypotheses were formulated:

“There are no significant relationships between the constraints faced in IPM practices and each of ten selected characteristics of the farmers”.

3.6 Data Collection Procedure

The researcher himself collected data through interview schedule from the sample respondents in a face to face situation during the pre-scheduled leisure period of respondent at his/her house or field. The researcher established desired rapport with the respondents so that they did not feel any hesitation at the time of interview. Whenever any respondent confronted difficulties in understanding questions, more attention was taken to explain those with a view to enable the farmers to answer properly. No serious problem was confronted by investigator during data collection but obtained cooperation from the respondents. Data collection was started in 10 June, 2013 and completed in 10 July, 2013.

3.7 Data processing

For data processing the following steps were followed:

3.7.1 Compilation and coding of data

After completion of field survey all the interview schedule were compiled, tabulated and analyzed according to the objectives of the study. In this process all the responses in the interview schedule were given numerical coded values. The responses to the question in the interview schedule were transferred to a master sheet to facilitate tabulation. Tabulation was done on the basis of categories developed by the investigator himself.

3.7.2 Categorization of respondents

For describing the various variables the respondents were classified into various categories. In developing categories the researcher was guided by the nature of data and general consideration prevailing on the social system. The procedures have been discussed while describing the variable in the sub-subsequent sections of next chapter.

3.8 Statistical Analysis of Data

Data collected from the respondents were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. Various statistical measures such as frequency counts, percentage distribution, mean, and standard deviation were used in describing data. Rank order was used to compare the constraints. SPSS (version 11.5) computer program was used for analyzing the data. The categories and tables were used in describing data. The categories and tables were also used in presenting data for better understanding.

For determining the relationships of the selected characteristics of the rice farmers with their constraints faced in IPM practices, Pearson's Product Moment Correlation co-efficient (r) was used. Five percent (0.05) level of probability was used as the basis for rejecting any null hypothesis.

CHAPTER 4

RESULTS AND DISCUSSION

In this Chapter, the findings are presented in four sections in accordance with the objectives of the study. The first section deals with the selected characteristics of the farmers. The second section has dealt with their constraints faced in IPM practices. The third section has dealt with relationships between the selected characteristics of the farmers and the constraints faced in IPM practices. The last section has dealt with the comparative severity among the constraints faced in IPM practices by the farmers in rice cultivation.

4.1 Characteristics of the farmers

The findings relating to the selected characteristics of the farmers, namely; age, education, total family members, rice cultivation area, training received in IPM practices, annual family income, extension media contact, agricultural experience, cosmopolitaness and knowledge on IPM are presented and discussed as follows:

4.1.1 Age

The age of the farmers was range from 17 to 73 years with a mean and standard deviation of 32.47 and 10.30 respectively. Considering the age, the farmers were classified into three categories namely 'young', 'middle' and 'old' aged. The distribution of the respondents' based on their age are presented in Table 4.1.

Table 4.1 Distribution of the farmers according to their age

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Young aged (up to 35 years)	65	60.75	32.47	10.30
Middle aged (35-50 years)	35	32.71		
Old aged (above 50 years)	7	6.40		
Total	107	100		

Table 4.1 indicates that the young aged rice farmers comprised the highest proportion (60.75 percent) followed by middle aged farmers (32.71 percent) and the lowest portion were the old aged farmers (6.40 percent). Data also indicates that the young and middle aged rice farmers constituted the 93.6 percent of the respondents.

4.1.2 Education

The score of education of the respondent farmers ranged from 0 to 12 with a mean and standard deviation of 4.12 and 3.47 respectively. Based on their score of educational level, the farmers were classified into five categories such as 'illiterate' (0), 'can sign only' (0.5), 'primary education' (1 to 5), 'secondary education' (6 to 10) and 'above secondary education' (above 10). The distribution of the farmers according to their educational level has been presented in Table 4.2.

Table 4.2 Distribution of the farmers according to their education

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Illiterate (0)	21	19.63	3.63	3.59
Can sign only (0.5)	23	21.50		
Primary education (1-5)	36	33.65		
Secondary education (6-10)	22	20.56		
Above secondary education (above 10)	5	4.67		
Total	107	100		

Table 4.2 shows that farmers under 'primary education category constituted the highest proportion (33.65 percent) compared to 21.50 percent can sign only, 20.56 percent secondary level category and 19.63 percent illiterate category. On the other hand the lowest 4.67 percent belongs to above secondary level category. The literacy rate of the study area was found to 58.87% which was very close to the national rate 59.82% (BBS, 2013). Education increases the consciousness and

mental development of the people which helps to sustain them in problematic situations.

4.1.3 Total family members

The total family members score was ranged from 2 to 9 with the mean and standard deviation of 3.92 and 1.86 respectively. Based on their total family members, the respondents were classified into three categories viz., small family (≤ 4 nos.), medium family (5 to 7 nos.) and large family (>7 nos.). The distribution of the farmers according to their family size has been presented in Table 4.3.

Table 4.3 Distribution of the farmers according to their total family members

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Small family (≤ 4 nos.)	75	70.09	3.92	1.86
Medium family (5 to 7 nos.)	25	23.36		
Large family (> 7 nos.)	7	6.54		
Total	107	100		

Table 4.3 indicates that the small family constitutes the highest proportion (76.7 percent) of the farmers followed by 19.4 percent with medium family and the lowest 3.9 percent large family. The findings of the study reveal that majority (96.1 percent) of the farmers have small to medium family size.

4.1.4 Rice cultivation area

Rice cultivation area of the farmers ranged from 0.02 ha to 2.13 ha with a mean and standard deviation of 0.55 and 0.42 respectively. Based on their rice cultivation area, the respondents were classified into three categories. These categories were small rice cultivation area (≤ 0.75 ha), medium rice cultivation area (0.76 to 1.5 ha) and large rice cultivation area (> 1.5 ha). The distribution of

the farmers according to their rice cultivation area categories has been presented in Table 4.4.

Table 4.4 Distribution of the farmers according to their rice cultivation area

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Small (≤ 0.75 ha)	75	70.09	0.55	0.42
Medium (0.76 - 1.50 ha)	27	25.23		
Large (> 1.50 ha)	5	4.67		
Total	107	100		

Table 4.4 indicates that the farmers having small rice cultivation area constitute the highest proportion (70.09 percent) of the respondent followed by 25.23 percent with medium rice cultivation area and only 4.67 percent had large rice cultivation area. The findings of the study revealed that overwhelming portion (95.33 percent) of the farmers had small to medium rice cultivation area.

4.1.5 Training received in IPM practices

Training received in IPM practices score of the respondent farmers ranged from 0 to 5 with a mean and standard deviation of 1.22 and 1.37 respectively. Based on their training received in IPM practices score, the respondents were classified into three categories. These categories were low and medium training received. The distribution of the respondents according to their training received in IPM practices has been presented in Table 4.5.

Table 4.5 Distribution of the farmers according to their training received in IPM practices

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Low training received (below 5)	103	96.24	1.22	1.37
Medium training received (≥ 5)	4	3.76		
Total	107	100		

Data in Table 4.5 indicates that 96.24 percent of the respondents had low training received in IPM practices and while the remaining 3.76 percent had medium training received in IPM practices only. Training helps the farmers to acquire deep knowledge and improve skills about the respected aspects. Trained farmers can cope and handle skillfully the adverse situation in crop cultivation because training helps the farmers to acquire deep knowledge and improve skills about the respected aspects. The findings of this study, however, indicate that whole portion of the farmers had low to medium training in IPM practices, who is supposed to face great difficulties in coping against the unfavorable condition regarding in IPM practices.

4.1.6 Annual family income

Annual family income scores of the respondents ranged from 62 to 388 with a mean and standard deviation of 140.79 and 75.96 respectively. On the basis of their annual income, the farmers were classified into three categories, viz. low, medium and high annual family income. The distribution of the farmers according to the annual family income categories has been presented in Table 4.6.

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

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Low income (≤ 120)	61	57.01	140.79	75.96
Medium income (121-250)	37	34.58		
High income (>250)	9	8.41		
Total	107	100		

Data in Table 4.6 revealed that the farmers having low income constitute the highest proportion (57.01 percent), medium income had of 34.58 percent farmers and the rest 8.41 percent had high annual family income. So, the Table 4.6 showed that, overwhelming portion (81.59 percent) of the rice farmers had low to

medium annual family income in the study area.

4.1.7 Extension media contact

The extension media contact score of the respondents farmers ranged from 10 to 38 against the possible range of zero '0' to 50 score with a mean and standard deviation of 22.30 and 6.65 respectively. Based on their extension media contact score, the respondents were classified into three categories. These categories were low, medium and high extension media contact. The distribution of the respondents according to their extension media contact has been presented in Table 4.7.

Table 4.7 Distribution of the farmers according to their extension media contact

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Low contact (≤ 16)	22	20.56	22.30	6.65
Medium contact (17-32)	75	70.09		
High contact (> 32)	10	9.35		
Total	107	100		

Table 4.7 indicates that the farmers having medium extension media contact category constituted the highest proportion (70.09 percent) followed by low contact (20.56 percent) and high contact category (9.35 percent). Table 4.7 showed that the overwhelming majorities (90.65 percent) of the farmers had low to medium extension media contact.

4.1.8 Agricultural experience

Agricultural experience of the respondents was range from 2 to 62 with a mean and standard deviation of 15.55 and 10.63 respectively. On the basis of their agricultural experience, the farmers were classified into three categories, viz. low

experienced, medium experienced and high experienced. The distribution of the farmers according to the agricultural experience categories has been presented in Table 4.8.

Table 4.8 Distribution of the farmers according to their agricultural experience

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Low experienced (≤ 5)	18	16.82	15.55	10.63
Medium experienced (6 -25)	78	72.90		
High experienced (> 25)	11	10.28		
Total	107	100		

Data in table 4.8 revealed that the farmers having medium agricultural experience constituted the highest proportion (72.90 percent) followed by low experience was 16.82 percent and high agricultural experience was 10.28 percent. Table 4.8 showed majorities (89.72percent) of the farmers had low to medium agricultural experience.

4.1.9 Cosmopolitaness

The maximum cosmopolitaness score of the respondents was 38 and the minimum score was 11 against the possible range of '0' to 40. However, the average was 22.36 and the standard deviation was 6.50. Based on their cosmopolitaness scores, the respondents were classified into two categories: low cosmopolitaness and medium cosmopolitaness. The distribution of the respondents according to their cosmopolitaness is shown in Table 4.9.

Table 4.9 Distribution of the farmers according to their cosmopolitaness

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Low cosmopolitaness (≤ 18)	31	28.97	22.36	6.50
Medium cosmopolitaness (19-36)	74	69.16		
High cosmopolitaness (> 36)	2	1.87		
Total	107	100		

Data contained in Table 4.9 indicate that the highest proportion (69.16 percent) of the rice cultivators had medium cosmopolitaness as compared to 28.97 percent of low cosmopolitaness and the remaining 1.87 percent farmer had high cosmopolitaness. Table 4.9 showed that the overwhelming portion (98.13 percent) of the farmers' had low to medium cosmopolitaness of the study area.



4.1.10 Knowledge on IPM

Knowledge on IPM score of the respondents was found to range from 6 to 29 against a possible range from zero (0) to 36. The mean was 15.07 with a standard deviation of 4.54. Based on the score of farmers' knowledge on IPM the respondents were classified into three categories as 'low knowledge' (≤ 12), 'medium knowledge' (13-24) and 'high knowledge' (> 24). The distribution of the respondents according to their knowledge on IPM has been presented in Table 4.10.

Table 4.10 Distribution of the farmers according to their knowledge on IPM

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Low knowledge level (≤ 12)	30	28.04	15.07	4.54
Medium knowledge level (13-24)	68	70.09		
High knowledge level (> 24)	2	1.87		
Total	107	100		

Findings shown in Table 4.10 indicate that the highest proportion (70.09 percent)

of the respondents had medium knowledge on related aspects while 28.04 percent had low knowledge and only 1.87 percent of the respondents had high knowledge on IPM. Table 4.10 showed that the overwhelming portion (98.13 percent) of the farmers' had low to medium knowledge on IPM.

4.2 Constraints faced in IPM practices

The score of constraints faced in IPM practices was ranged from 15 to 38 against a possible range from zero (0) to 48. And the average was 25.03 with a standard deviation of 6.43. Based on the score of constraints faced in IPM practices, the farmers were classified into two categories as 'low constraint' (≤ 16), 'medium constraint' (17-32) and 'high constraint' (> 32). The distribution of the respondents according to their constraints faced in IPM practices has been presented in Table 4.11.

Table 4.11 Distribution of the farmers according to their constraints faced in IPM practices

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Low constraint (≤ 16)	7	6.54	25.03	6.43
Medium constraint (17-32)	81	75.70		
High constraint (> 32)	19	17.76		
Total	107	100		

Findings shown in table 4.11 indicate that the highest proportion (75.70 percent) of the respondents' faced medium constraints in IPM practices, while the 17.76 percent of the respondents' confronted high constraint and the rest 6.54 percent of the respondents faced low constraints in IPM practices. Table 4.11 showed that the overwhelming portion (93.46 percent) of the farmers' faced medium to high constraints in IPM practices. The findings have much resemblance with the practical scenario. Generally, most famers are less conscious about environmental

degradation as well as various hazardous effects of chemical pesticides. But they want rapid and quick results. So, practically they prefer chemical pesticides than IPM practices. Though there have other drawbacks like; in a large area all fields' farmers have to adopt IPM practices combined. That is complex due to different adopter categories.

4.3 Relationship between the constraints faced by the farmers in IPM practices in rice cultivation and their selected characteristics

Pearson's Product Moment Correlation Co-efficient (r) was computed in order to find out the extent of relationship between the constraints faced in IPM practices and their selected characteristics. To reject or accept any null hypotheses, 0.05 level of probability was used. Results of correlation have been shown in Table 4.12. Correlation co-efficient among all the variables may be seen in the correlation matrix in Appendix-B.

Table 4.12 Relationship between the constraints faced in IPM practices by the farmers and their selected characteristics

N = 107

Dependent variable	Independent variables	Value of co-efficient of correlation (r)	Tabulated value at 105 df	
			0.05 level	0.01 level
Constraints faced by the farmers in IPM practices	Age	-0.036 ^{NS}	0.192	0.250
	Education	-0.256**		
	Total family members	0.112 ^{NS}		
	Rice cultivation area	0.023 ^{NS}		
	Training received in IPM practices	-0.251**		
	Annual family income	-0.140 ^{NS}		
	Extension media contact	-0.285**		
	Agricultural Experience	-0.131 ^{NS}		
	Cosmopolitaness	-0.262**		
	Knowledge on IPM	-0.333**		

^{NS} Not significant

**Significant at the 0.01 level

*Significant at the 0.05 level

4.3.1 Relationships between constraints faced in IPM practices by the farmers and their age

Relationship between age and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson's product moment correlation coefficient.

The coefficient of correlation between age and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.036. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of "r" (-0.036) between the concerned variables was found to be smaller than the tabulated value ($r = 0.192$) with 105 degrees of freedom at 0.05 level of probability.
- c. The null hypothesis could not be rejected.
- d. The relationship between the concerned variables was statistically non significant at 0.05 level of probability.

Based on the above findings, it was concluded that age of the farmers had no significant negative relationships with the constraints faced in IPM practices.

4.3.2 Relationships between constraints faced in IPM practices by the farmers and their education

Relationship between education and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson's product moment correlation coefficient.

The coefficient of correlation between education and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.256. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of “r” (-0.256) between the concerned variables was found to be greater than the tabulated value ($r = 0.250$) with 105 degrees of freedom at 0.01 level of probability.
- c. The null hypothesis was rejected.
- d. The relationship between the concerned variables was statistically significant at 0.01 level of probability.

Based on the above findings, it was concluded that education of the famers had significant negative relationships with the constraints faced in IPM practices. Education is the key point to increase knowledge, skill and experiences to cope up any constraint or problem. So, increase in educational level could be supportive to decrease in constraints faced in IPM practices by the farmers. The similar result was found by Alam (2008), Rahman (2008) and Hoque (2001).

4.3.3 Relationships between constraints faced in IPM practices by the farmers and their total family members

Relationship between total family members and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson’s product moment correlation coefficient.

The coefficient of correlation between total family members and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between

the concerned variables was found 0.112. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of “r” (0.112) between the concerned variables was found to be smaller than the tabulated value ($r = 0.192$) with 105 degrees of freedom at 0.05 level of probability.
- c. The null hypothesis could not be rejected.
- d. The relationship between the concerned variables was statistically non significant at 0.05 level of probability.

Based on the above findings, it was concluded that total family members of the famers had no significant relationships with the constraints faced in IPM practices.

4.3.4 Relationships between constraints faced in IPM practices by the farmers and their rice cultivation area

Relationship between rice cultivation area and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson’s product moment correlation coefficient.

The coefficient of correlation between rice cultivation area and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found 0.023. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.

- b. The observed value of “r” (0.023) between the concerned variables was found to be smaller than the tabulated value ($r = 0.192$) with 105 degrees of freedom at 0.05 level of probability.
- c. The null hypothesis could not be rejected.
- d. The relationship between the concerned variables was statistically non significant at 0.05 level of probability.

Based on the above findings, it was concluded that rice cultivation area of the farmers had no significant relationships with the constraints faced in IPM practices.

4.3.5 Relationships between constraints faced by the farmers in IPM practices and their training received in IPM practices

Relationship between training received in IPM practices and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson’s product moment correlation coefficient.

The coefficient of correlation between training received in IPM practices and constraints faced by the farmers in IPM practices of the farmers is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.251. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a positive trend between the concerned variables.
- b. The observed value of “r” (-0.251) between the concerned variables was found to be greater than the tabulated value ($r = 0.250$) with 105 degrees of freedom at 0.01 level of probability.
- c. The null hypothesis was rejected.

- d. The relationship between the concerned variables was statistically significant at 0.01 level of probability.

Based on the above findings, it was concluded that training received in IPM practices had significant negative relationships with the constraints faced in IPM practices.

4.3.6 Relationships between constraints faced by the farmers in IPM practices and their annual family income

Relationship between annual family income and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson's product moment correlation coefficient.

The coefficient of correlation between annual family income and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.140. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of "r" (-0.140) between the concerned variables was found to be smaller than the tabulated value ($r = 0.192$) with 105 degrees of freedom at 0.05 level of probability.
- c. The null hypothesis could not be rejected.
- d. The relationship between the concerned variables was statistically non significant at 0.05 level of probability.

Based on the above findings, it was concluded that annual family income of the farmers had no significant negative relationships with the constraints faced in IPM practices by the farmers in rice cultivation.

4.3.7 Relationships between constraints faced by the farmers in IPM practices of the and extension media contact

Relationship between extension media contact and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson's product moment correlation coefficient.

The coefficient of correlation between extension media contact and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.285. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of "r" (-0.285) between the concerned variables was found to be greater than the tabulated value ($r = 0.250$) with 105 degrees of freedom at 0.01 level of probability.
- c. The null hypothesis was rejected.
- d. The relationship between the concerned variables was statistically highly significant at 0.01 level of probability.

Based on the above findings, it was concluded that extension media contact had highly significant negative relationships with the constraints faced in IPM practices.

4.3.8 Relationships between constraints faced by the farmers in IPM practices and their agricultural experience

Relationship between agricultural experience and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson's product moment correlation coefficient.

The coefficient of correlation between agricultural experience and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.131. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of "r" (-0.131) between the concerned variables was found to be smaller than the tabulated value ($r = 0.192$) with 105 degrees of freedom at 0.05 level of probability.
- c. The null hypothesis could not be rejected.
- d. The relationship between the concerned variables was statistically non significant at 0.05 level of probability.

Based on the above findings, it was concluded that agricultural experience of the farmers had no significant negative relationships with the constraints faced in IPM practices.

4.3.9 Relationships between constraints faced by the farmers in IPM practices and their cosmopolitanism

Relationship between cosmopolitanism and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson's product moment correlation coefficient.

The coefficient of correlation between cosmopolitanism and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.262. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of “r” (-0.262) between the concerned variables was found to be greater than the tabulated value ($r = 0.250$) with 105 degrees of freedom at 0.01 level of probability.
- c. The null hypothesis was rejected.
- d. The relationship between the concerned variables was statistically highly significant at 0.01 level of probability.

Based on the above findings, it was concluded that cosmopolitanism of the farmers had highly significant negative relationships with the constraints faced in IPM practices.

4.3.10 Relationships between constraints faced by the farmers in IPM practices and their knowledge on IPM

Relationship between knowledge on IPM and constraints faced in IPM practices by the farmers in rice cultivation was determined by Pearson’s product moment correlation coefficient.

The coefficient of correlation between knowledge on IPM and constraints faced in IPM practices is presented in Table 4.12. The coefficient of correlation between the concerned variables was found -0.333. The following observations were made

on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.
- b. The observed value of “r” (-0.333) between the concerned variables was found to be greater than the tabulated value ($r = 0.250$) with 105 degrees of freedom at 0.01 level of probability.
- c. The null hypothesis was rejected.
- d. The relationship between the concerned variables was statistically highly significant at 0.01 level of probability.

Based on the above findings, it was concluded that knowledge on IPM of the farmers had highly significant negative relationships with the constraints faced in IPM practices.

4.4 Comparative severity among the constraints faced in IPM practices by the farmers in rice cultivation.

The farmers of the study area faced more or less constraints in IPM practices in rice cultivation. A constraint faced index (CFI) by the farmers in IPM practices was calculated for each of the constraints in IPM practices. The rank order of the constraints was made on the basis of the descending order of the CFI. Comparative view of the 12 selected constraints has been shown in Table 4.13 on the basis of their Constraints Faced Index (CFI).

Table 4.13 Rank order of 12 selected items of constraints faced by the farmers in IPM practices according to descending order of CFI

Sl. No.	Constraints	Percentage (%) of the respondents					Constraint Faced Index (CFI)	Rank Order (RO)
		Faced high constraint (C _h)	Faced medium constraint (C _m)	Faced low constraint (C _l)	Faced very low constraint (C _v)	Faced no constraint (C _n)		
01.	Lack of technical knowledge in IPM practices	78.7	16.9	4.4	0	0	374.3	1
02.	Lack of technical support in IPM practices	71.2	14.9	7.2	6.7	0	350.6	2
03.	Unavailability of inputs of IPM practices	49.7	31.9	10.7	6.3	1.4	322.2	3
04.	High cost of inputs of IPM practices	43.4	24.5	21.6	8.2	2.3	298.5	4
05.	Lack of eagerness to use of IPM practices	18.3	31.8	26.2	13.7	10	234.7	5
06.	Surrounding farmers are not interested towards IPM practices	4.4	30.4	37.9	11.2	16.1	195.8	6
07.	Lack of demonstration plot	2.4	26.3	34.2	21.5	15.6	178.4	7
08.	Require more labor than chemical pesticide treatments	1.8	19.5	37.9	24.3	16.5	165.8	8
09.	Lack of knowledge and awareness about soil fertility and environmental pollution	0.7	8.7	41.2	28.7	20.7	140	9
10.	Availability of chemical pesticides in local market	0.3	4.2	43.1	31.8	20.6	131.8	10
11.	Lack of knowledge about beneficiaries and harmful insects and pests	0	1.4	36.4	39.4	22.8	116.4	11
12.	Doubt about the effectiveness of IPM practices	0	0	16.7	58.6	24.7	92	12

Constraint Faced Index (CFI) of the farmers on 12 items of constraints faced in IPM practices was ranged from 92 to 374.3 against the possible range of 0 to 400. The CFI in the Table 4.13 revealed that the farmers confronted highest constraint was “lack of technical knowledge in IPM practices” followed by “lack of technical support in IPM practices” and “unavailability of inputs of IPM practices”.

It is to be noted here that, all the constraints have been faced by the farmers in their IPM Practices in rice cultivation. Some may be most severe and some may be less. However, lowest serious constraint was identified as “doubt about the effectiveness of IPM practices” which was positioned in the rank order at 12th.

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the summary of findings, conclusions and recommendations of this study.

5.1 Summary of Findings

5.1.1 Characteristics of the farmers

Age: The young aged rice farmers comprised the highest proportion (60.75 percent) followed by middle aged farmers (32.71 percent) and the lowest portion were the old aged farmers (6.40 percent).

Education: Farmers under 'primary education category constituted the highest proportion (33.65 percent) compared to 21.50 percent can sign only, 20.56 percent secondary level category and 19.63 percent illiterate category. On the other hand the lowest 4.67 percent belongs to above secondary level category.

Total family members: The small family constitutes the highest proportion (76.7 percent) of the farmers followed by 19.4 percent with medium family and the lowest 3.9 percent large family.

Rice cultivation area: The farmers having small rice cultivation area constitute the highest proportion (70.09 percent) of the respondent followed by 25.23 percent with medium rice cultivation area and only 4.67 percent had large rice cultivation area.

Training received in IPM practices: In the study area 96.24 percent of the respondents had received low training in IPM practices and while the remaining 3.76 percent had received medium training in IPM practices only.

Annual family income: The farmers having low income constitute the highest proportion (57.01 percent), medium income had of 34.58 percent farmers and the rest 8.41 percent had high annual family income.

Extension media contact: The farmers having medium extension media contact category constituted the highest proportion (70.09 percent) followed by low contact (20.56 percent) and high contact category (9.35 percent).

Agricultural experience: The farmers' having medium agricultural experience constituted the highest proportion (72.90 percent) followed by low experience was 16.82 percent and high agricultural experience was 10.28 percent.

Cosmopolitaness: The highest proportion (69.16 percent) of the rice cultivators had medium cosmopolitaness as compared to 28.97 percent of low cosmopolitaness and the remaining 1.87 percent farmer had high cosmopolitaness.

Knowledge on IPM: The highest proportion (70.09 percent) of the respondents had medium knowledge on related aspects while 28.04 percent had low knowledge and only 1.87 percent of the respondents had high knowledge on IPM.

5.1.2 Constraints faced in IPM practices:

The highest proportion (75.70 percent) of the respondents' faced medium constraints in IPM practices, while the 17.76 percent of the respondents' confronted high constraint and the rest 6.54 percent of the respondents faced low constraints in IPM practices.

5.1.3 Relationship between the constraints faced in IPM practices by the farmers in rice cultivation with their selected characteristics

Education, training received in IPM practices, extension media contact, cosmopolitaness and knowledge on IPM of the rice farmers had significant

negative relationships with their constraints faced in IPM practices. Age, total family members, rice cultivation area, annual family income and agricultural Experience of them had no significant relationships with the constraints faced in IPM practices.

5.1.4 Comparative severity among the constraints faced in IPM practices by the farmers in rice cultivation

According to the constraint faced index (CFI) the highest constraint was “lack of technical knowledge in IPM practices” followed by “lack of technical support in IPM practices” and “unavailability of inputs of IPM practices”.

5.2 Conclusions

Conclusions drawn on the basis of the findings of this study and their logical interpretation in the light of the other relevant factors are furnished below:

1. The overwhelming portion (93.46 percent) of the farmers' faced medium to high constraints in IPM practices. Therefore, it may be concluded that farmers of the study area faced constraints in IPM practices to a variety of degrees.
2. There existed a negatively significant relationship between farmers' education and their constraints faced in IPM practices. Therefore, it may be concluded that, low educated farmers confronted high problems or with the increase in educational level of the farmers tend to decrease their constraints faced in IPM practices in rice cultivation.
3. A strong negative significant relationship was found between training received in IPM practices and their constraints faced in IPM practices. The findings revealed that whole portion of the respondents received low to medium

training on IPM practices. Therefore, it may be concluded that, there is an urgent need of training facilities.

4. There had a strong negative significant relationship between farmers' extension media contact and constraints faced in IPM practices and an overwhelming majority (90.65 percent) of the farmers had low to medium extension media contact in the study area. Therefore, it may be concluded that, with the increase in extension media contact of the farmers tends to decrease their constraints faced in IPM practices in rice cultivation.
5. An overwhelming portion (98.13 percent) of the farmers possessed low to medium cosmopolitaness, while there was a strong negative significant relationship between cosmopolitaness of the farmers and their constraints faced in IPM practices. Therefore, it may be concluded that, low cosmopolite farmers confronted high constraints or with the increase of cosmopolitaness of the farmers tends to decrease their constraints faced in IPM practices in rice cultivation.
6. There had a strong negative significant relationship between farmers' knowledge on IPM and constraints faced in IPM practices and the overwhelming majority (98.13 percent) of the farmers had low to medium knowledge on IPM in the study area. Therefore, it may be concluded that, with the increase in knowledge on IPM of the farmers tends to decrease their constraints faced in IPM practices.
7. The study revealed that, the farmers of the study area faced all the constraints at various degrees of severities. From the rank order of the constraints it was concluded that the highest severe constraint was "lack of technical knowledge

in IPM practices” followed by “lack of technical support in IPM practices” and “unavailability of inputs of IPM practices”.

5.3 Recommendations for policy implications

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

1. The overwhelming portion (93.46 percent) of the farmers faced medium to high constraints in IPM practices. Therefore, it may be recommended that necessary steps should be taken to minimize the constraints faced in IPM practices by the farmers of the study area.
2. Education of the farmers had significant negative relationship with their constraints faced in IPM practices. Therefore, it may be recommended that, adult education should be provided to the farmers so that they could increase their educational level as well as illiterate and can sign only farmers could read the leaflets, posters and different information sources regarding IPM practices and its' benefits which might be helpful to decrease their constraints faced in IPM practices.
3. Training received on IPM practices had significant negative relationship with their constraints faced in IPM practices. Training is very crucial particularly for IPM practices because it is multifold practices. The finding in the study area regarding training received on IPM practices is very poor. Hence, it is recommended that the DAE and other concern NGOs should conduct frequent training, teaching programs etc. for the farmers so that they would be able to cope up the constraints on IPM practices in their rice cultivation.

4. Extension media contact had significant negative relationship with constraints faced by the farmers in IPM practices. Therefore, it may be recommended that, extension service providers should increase their contacts with farmers so that the farmers could minimize their constraints by setting information from the extension providers.
5. Cosmopolitaness had significant negative relationship with constraints faced by the farmers in IPM practices in. Therefore, it may be recommended that, DAE should increase their motivational programs that would make the farmers more innovative to adopt various new convenient technologies of IPM practices in rice cultivation.
6. Knowledge on IPM practices had significant negative relationship with the constraints faced by the farmers in IPM practices. Therefore, it may be recommended that, there should be conducted more extension works for educating and training the farmers which will increase their knowledge and skills and will be supportive to solve their constraints faced in IPM practices.
7. In case of Constraints Faced Index it is recommended that the priority for taking necessary steps to minimize the constraints should be given according to the rank order of the severity among the constraints.

5.3.1 Recommendation for further study

This study investigated constraints faced in IPM practices by the farmers in rice cultivation. As a small and limited research has been conducted in the present study cannot provide much information related to this aspect. Further studies should be undertaken to covering more information in the relevant matters. So the following suggestions were put forward for further research:

1. The present study was conducted only in two villages of Nabinagar Upazila under Brahmanbaria District. Findings of the study need further verification through similar research in other parts of the country.
2. It is difficult to explore all the constraints faced in IPM practices by the farmers in rice cultivation. Measurement of problems of the farmers is not free from questions. More reliable measurement of concerned variables is necessary for further study.
3. The study investigated the relationship of ten characteristics of the rice farmers with their constraints faced in IPM practices. So it is recommended that further study would be conducted with other dependent and independent variables.
4. The study investigated only 12 dimensions of constraints faced in IPM practices in rice cultivation. It is necessary to examine the relationships of the characteristics of the farmers with their constraints faced in IPM practices in other aspect of agricultural problem confrontation.



BIBLIOGRAPHY

- Agnew, JR., Simla, air Stainlay, C. Whiteing, and D.M. Hogarth. 2002. Increased sugar industry profitability through harvesting based practice. Proceeding of the 2002 Conference of the Australian Society of Sugarcane Technology held at Carrus Queensland, Australia. 29 April to 2 May, 2002: 184-189.
- Ahmed, S. 2002. Problem Confrontation of the Contact Growers of BADC in Jute Seed Production. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Akanda, M.G.R. 1993. Problem Confrontation of the Farmers in Respect of Cultivating Mukta (BR11) Rice. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Akanda, M.G.R. 2005. Technological Gap in Modern Rice Production at Farmers' level. Ph.D. Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Alam, A.T.M.M., R. Choudhury and M.Z.A. Chowdhury. 2003. Rice production at farmers' level: practices and problems. Bangladesh Journal of Training and Development, 13 (1&2): 229-236.
- Alam, A.Q.M.S. 2008. Constraints Analysis in Adoption of IPM Practices in Rice Cultivation by the Farmers of Savar Upazila under Dhaka District. MS. (A.E.I.S.) Thesis, Department of Agricultural Extension Information System, Sher-e-Bangla Agricultural University, Dhaka.

- Ali, M.A. 1999. Opinion of Unemployment Rural Youth on Self-employment by Undertaking Selected Income-generation Activities. M.Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Anwar, A.B.M.N. 1994. Study for Involving Rural Youth Activities in Three Selected Villages of Mymensingh District. Ph.D. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Anonymous. 1999. DAE-DANIDA Strengthening Plant Protection Services Project and Overview, DAE-DANIDA, Khamarbari, Dhaka, Bangladesh.
- Anonymous. 2001. A Leaflet of Northwest Crop Diversification Project, Project Management Unit, Department of Agricultural Extension, Khamarbari, Dhaka, Bangladesh.
- Arya, S. R.S. and S.L. Shah, 1984. New Technology of Rainfed Agriculture and Identification of Problems on its Adoption in Mid-hills of U.P. Agricultural Station in India. 37(7): 487-490. Rural Development Abstracts. 1985. 8(2).
- BBS. 2012. Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics, Statistical division, Ministry of Planning, Government of People's Republic of Bangladesh, Dhaka.
- BBS. 2013. Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics, Statistical division, Ministry of Planning, Government of People's Republic of Bangladesh, Dhaka.

- Bhuiyan, M.A.S. 2002. Problem Confrontation of the Farmers in Banana Cultivation in Kuliarchar upazila under Kishoreganj District. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Chander, S.H.N. and Singh, J.P. 2003. Knowledge, Adoption and Constrains Analysis of IPM Practices. Indian Journal of Extension Education. XXVI(1&2): 94-98.
- Faroque, M.G. 1997. Participation of Female Rural Youth in Selected Homestead Activities in Two selected villages of Bhaluka Upazila under Mymensingh District. MS. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Freeman, WA. and S.A. Breth, 1994. Population pressure land use and the productivity of Agricultural Systems in the West African Savanna, Issues in African Rural Development: 103-114.
- Goode, W.J. and P.K. Hatt 1952. Methods of Social Research. New York: McGraw-Hill Book Company, Inc. p. 56.
- Gumisiriza, G.W. Wagoire, B. Bungutski and D.G. Tanner 1994. Wheat Production and Research in Uganda; Problems and Susta inability. Developing sustainable wheat production systems. The 8th Regional Wheat Workshop for Easter, Central and Southern Africa, Kampala, Uganda 7 to 10 June 1993: 51-56.

- Halim, M.A. 2003. Problems confrontation of the farmers in Adopting Crop Diversification. MS. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Hasan, A.N.M. 2005. Problem Confrontation of the Farmers in Crop Production Activities in Two Selected Villages of Atrai Upazila in Naogaon District. M.S. Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Haque, M.S. 1995. Problem Confrontation of the Members of Mohila Bittaheen Samabaya Samitte working under the Bangladesh Rural Development Board. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Hossain, S.M.A. 1985. A study of the Landless Labourers in Bhabakhali Union of Mymensing District. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Hossain, M.S. 2002. Resource Poor Farmers Problem Confrontation in using Manures towards Integrated Plot Nutrition System. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Hoque, M.K. 2001. Environmental Awareness and Problem Confrontation of the FFS Farmer in Practicing IPM. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

- Islam, M.N. 1987. Artificial Insemination Problem Confrontation of the Farmers in two Selected Union of Modhupur Upzilla under Tangail District, M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Ismail, S.M. 2001. Agricultural Problem confrontation of the Farm Youth in a Selected Block of Haor Area of Mohanganj Upazila under Netrokona District. MS. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Karim, M.L. 1996. Relationship of Selected Characteristics of Kakrol Growers with Their Problem Confrontation. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Kashem, M.A. 1977. A study of the Landless Farmers of Bharakhata Union Under Rangpur District. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Karmakar, S. 2004. Constrains Faced by the Farmers in Adopting Aquaculture Technologies. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Kenmore, P. 1991. How Rice Farmers Clean up the Environment, Conserve Biodiversity, Raise More Food, Make Higher Profits: Indonesia's IPM - A Model for Asia, Manila, Philippines : FAO.
- Kenmore, P. 1997. A perspective on IPM. *ILEIA Newsletter*: 13(4): 8-9.

- Kumar, S.C.R., Shivarmu, H.S., Chary, G.R., Yadav, S.C. and Gaikwad. 1995, Economics of improved management practices, their extent and problems in adoption in Madya District, Karnataka. *Journal of Soils and Crops*. 5(1): 22-25.
- Marothia, D.K. 1983. Constrains Analysis of Farm Level Adption of Paddy Technology in Raipur District, Madhya Pardesh. *Rural Development Abstracts*, 8(2): 132.
- Mansur, M.A.A. 1989. Farmers Problem Confrontation in Feeds and Feeding Cattle in Sonapur Union of Raipur Upazial Under Lakshmipur District. M.Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.
- MOA. 2011. National Integrated Pest Management Policy. Ministry of Agriculture, Government of people Republic of Bangladesh, Dhaka.
- Pramanik, N.K. 2001. Crop Cultivation problems of the Farm Youth in A Selected Block of Muktagacha Upazila under Mymensingh District. MS. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Rahman, M.S. 2008. Agricultural Problem Confrontation by the Charland Farmers of Jamuna River. MS. (A.E.I.S.) Thesis, Department of Agricultural Extension Information System, Sher-e-Bangla Agricultural University, Dhaka.
- Rahman, M.H. 1995. Problems confrontation of the farmers in Cotton Cultivation. MS. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

- Rahman, M.S. 1996. "Farmers' Problems in Potato Cultivation Satia Union under Gafforgaon Thana of Mymensingh District." M.Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Raha, S.K., R.K. Talukder and M.H. Rahman. 1986. Relative profitability of cotton and its competing crops in Bangladesh. *Bangladesh Journal of Agricultural Economics*. 9(1): 74-82.
- Raha, A.K. 1989. Deep Tubewell Irrigation Problems of the Farmers in the Cultivation of Boro Paddy in Two Selected Blocks of Muktagacha Upazila under Mymensingh District. M.Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension & Teachers' Training, Bangladesh Agricultural University, Mymensingh.
- Ramachandran, P. and K.B. Sripal, 1990. Problems in Adoption of Dryland Technology for Rainfed Cotton. *Indian Journal Extension Education*. XXIV(3 & 4) : 74-76.
- Ramasswamy, S. 1992. Pest Control and Environment. Notes for Discussion at a Seminar on "Environment and Agriculture". BARC, Farmgate, Dhaka.
- Rashid, M.H. 1975. Agricultural Problems of Farmers in Modhupur Union of Tangail District, M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Rashid, M.M. 1999. Willingness of Dropout Rural Youth of undertaking Selected Agricultural Entrepreneurship in their Self-employment. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

- Rashid, M.Z. 2003. Participation of School Dropout Rural Youth in Selected Agricultural Activities in Two Villages of Mymensingh District. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Saha, B.K. 1983. Farmers' Problem Confrontation in Respect of Breeding of Poultry through Cockrel Exchange Programme and other Aspects in Dewkhali Union of Phulbaria Thana under Mymensingh District. M.Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension & Teachers' Training, Bangladesh Agricultural University, Mymensingh.
- Sarker, G.C.1983. Relationship of Selected Characteristics of the Poultry Farmers in Tarundia union of Mymensingh District with their Poultry Problem Confrontation. M.Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University. Mymensingh.
- Salam, M.A. 2003. Problems Confrontation of the Farmers in Adopting Environmentally Friendly Farming Practices. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.
- Shehrawat, P.S. and R.K. Sharma. 1994. Educated Unemployed Rural Youth: Problems Encountered, Factors Dissuading Them from Family Occupation, and their Human Resources Development. *Journal of Rural Reconstruction*. 27(1): 73-82.

Uddin, M.J. 2004. Problems Confrontation of the Farmers in Commercial Cultivation of Vegetables. MS. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Appendix I. English version of the interview schedule

DEPARTMENT OF AGRICULTURAL EXTENSION AND INFORMATION SYSTEM
SHER-E-BANGLA AGRICULTURAL UNIVERSITY
DHAKA-1207

An interview schedule for a research study entitled

“CONSTRAINTS FACED BY THE FARMERS IN IPM PRACTICES IN RICE CULTIVATION AT NABINAGAR UPAZILA UNDER BRAHMANBARIA DISTRICT”

Respondent No.

Respondent Name:

Village: Union:

Upazila: District:

[Please provide following information. Your information will be kept confidential and will be used for research purpose only.]

1. Age

What is your present age? Years

2. Education

Please mention your educational level.

- a) Cannot read and write
- b) Can sign only
- c) Did not read in School/Madrasha but can read and write and level of education is equivalent to class
- d) Have passed class

3. Total family members

Including yourself, how many members belong to your family?

Male: Nos. Female:Nos. Total:Nos.

4. Rice cultivation area

Mention the area you have cultivated rice last year

..... acre/bigha/pakhihectare

5. Training received in IPM practices

Have you attended at any training program on IPM practices?

Yes No

If yes, please mention the following information.

Sl. No.	Title of Training	Offering organization	Duration of Training(days)
01.			
02.			
03.			
04.			
05.			
Total			

6. Annual family income

Please mention the amount of annual income from the following sources.

(a) Income from Agricultural Crop		
Sl. No.	Crop Name	Total Income (Tk/Year)
1	Rice	
2	Wheat	
3	Maize	
4	Potato	
5	Jute	
6	Pulse crop	
7	Oil crop	
8	Spice crop	
9	Vegetable	
10	Fruits	
(b) Income from domestic animals and fish resources		
11	Domestic animal	
12	Poultry	
13	Fish resources	
(c) Income from another resources		
14	Services	
15	Business	
16	Day labor	
17	Other family members	
Total annual family income (Tk.)		

7. Extension media contact

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

Sl. No.	Media of Communication	Extent of Visit				
		Regularly	Frequently	Occasionally	Rarely	Not at all
1	SAAOs	> 12 Times/year	9-12 Times/year	5-8 Times/year	1-4 Times/year	0
2	Agricultural Extension Officer	7-8 Times/year	5-6 Times/year	3-4 Times/year	1-2 Times/year	0
3	Upazilla Agricultural Officer	7-8 Times/year	5-6 Times/year	3-4 Times/year	1-2 Times/year	0
4	Group discussion	7-8 Times/year	5-6 Times/year	3-4 Times/year	1-2 Times/year	0
5	Model farmer	>8 Times/month	5-8 Times/month	3-4 Times/month	1-2 Times/month	0
6	NGO worker	>5 Times/month	4-5 Times/month	2-3 Times/month	1 Time/month	0
7	Friend/Neighbor	12-15 Times/month	8-11 Times/month	4-7 Times/month	1-3 Times/month	0
8	Television	>12 times/month	8-12 times/month	4-7 times/month	1-3 times/month	0
9	Input dealer	>4 Times/month	3-4 Times/month	2 Times/month	1 Time/month	0
10	Newspaper	>6 times/week	5-6 times/week	3-4 times/week	1-2 times/week	0

8. Agricultural Experience

Please mention your agricultural experience.

9. Cosmopolitaness

How frequently do you visit in the following selected places? Give (✓) tick mark against appropriate place

Sl. No.	Place of visit	Frequency of visit				
		Regularly	Oftenly	Occasionally	Rarely	Not at all
01	Other villages outside own village	7 days/ week	5-6 days/ week	3-4 days/ week	1-2 days/ week	0
02	Near Hat/ Bazar	7 days/ week	5-6 days/ week	3-4 days/ week	1-2 days/ week	0
03	Own union office	>7 times/ month	5-7 times/ month	2-4 times/ month	1 time/ month	0
04	Other unions	>5 times/ month	4-5 times/ month	2-3 times/ month	1 time/ month	0
05	Upazila sadar	>12 times / year	8-12 times/ year	4-7 times/ year	1-3 times/ year	0
06	Other upazila sadars	>8 times / year	6-8 times / year	3-5times/ year	1-2 times/ year	0
07	Own district town	>8 times / year	6-8 times / year	3-5times/ year	1-2 times/ year	0
08	Other district towns	>6 times / year	4-6 times / year	2-3times/ year	1 time/ year	0
09	Divisional city	4 times / year	3 times / year	2 times/ year	1 time/ year	0
10	Capital city	4 times / year	3 times / year	2 times/ year	1 time/ year	0

10. Knowledge on IPM

Please answer the following questions.

Sl. No.	Questions	Assigned scores	Obtained marks
1	What do you mean by IPM?	2	
2	Mention the methods of IPM.	2	
3	Name two major pests of rice.	2	
4	What is predator and parasite?	2	
5	Name two beneficial insects of rice.	2	
6	Name two pesticides available in your local market.	2	
7	Mention two disadvantages of pesticides.	2	
8	Mention two IPM techniques?	2	
9	What is light trap?	2	
10	What do you mean by sex-pheromone?	2	
11	What is the symptom of rat infestation in rice field?	2	
12	Name two local techniques of aphid control.	2	
13	What do you mean by resistant variety?	2	
14	Why crop rotation is necessary?	2	
15	Mention two bio-pesticides?	2	
16	What do you mean by healthy seed?	2	

17	What are the advantages to weed management?	2	
18	What do you know about environmental pollution?	2	
Total		36	

11. Constraints faced in IPM practices

Please indicate the extent of constraints faced in IPM practices.

Sl. No.	Constraints	Extent of constraints facing				
		High	Medium	Low	Very low	Not at all
1	Doubt about the effectiveness of IPM practices.					
2	Lack of technical knowledge in IPM practices.					
3	Lack of technical support in IPM practices.					
4	Unavailability of inputs of IPM practices.					
5	High cost of inputs of IPM practices.					
6	Lack of eagerness to use of IPM practices.					
7	Surrounding farmers are not interested towards IPM practices.					
8	Lack of demonstration plot.					
9	Require more labor than chemical pesticide treatments.					
10	Lack of knowledge and awareness about soil fertility and environmental pollution.					
11	Availability of chemical pesticides in local market.					
12	Lack of knowledge about beneficiaries and harmful insects and pests.					

(Thank you for your cooperation)



Date:

.....

Signature of the interviewer

Appendix-B. Correlation Matrix

Characters	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	Y
X ₁	1										
X ₂	-.100	1									
X ₃	-.004	-.070	1								
X ₄	.031	-.241*	.121	1							
X ₅	-.038	.053	-.091	-.024	1						
X ₆	.081	.552**	-.225*	-.117	.053	1					
X ₇	.034	-.027	-.112	.049	.197*	.061	1				
X ₈	.955**	-.093	.047	.027	.015	.066	.090	1			
X ₉	.014	.164	-.045	-.014	.225*	.066	.159	.066	1		
X ₁₀	-.023	.144	.014	-.029	.387**	.084	.186	.086	.413**	1	
Y	-0.036	-0.256**	0.112	0.023	-0.251**	-0.140	-0.285**	-0.131	-0.262**	-0.333**	1

X₁: Age
 X₂: Education
 X₃: Total family members
 X₄: Rice cultivation area
 X₅: Training received in IPM practice
 Y: Problem confrontation in T-aman cultivation

X₆: Annual family income
 X₇: Extension media contact
 X₈: Agricultural Experience
 X₉: Cosmopolitaness
 X₁₀: Knowledge on IPM

Sher-e-Bangla Agricultural University
 Library
 Accession No. 38703
 Sign: *[Signature]* Date 2.12.14