ADOPTION OF SELECTED RICE PRODUCTION PRACTICES BY THE FARMERS OF CHAR - LAND OF GOMOTI RIVER

A Thesis
By

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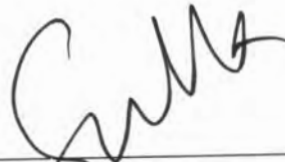AGRICULTURAL EXTENSION AND INFORMATION SYSTEM

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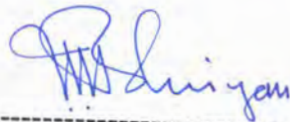Supervisor

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CERTIFICATE

This is to certify that the thesis entitled, "Adoption of Selected Rice Production Practices by the Farmers of Char-land of Gomoti River" submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE in AGRICULTURAL EXTENSION AND INFORMATION SYSTEM embodies the result of a piece of *bonafide* research work carried out by Mohammad Masudur Rahman Talukder Registration No.22840/00269 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

Dated: 25. 2. 07
Place: Dhaka, Bangladesh

(Prof. Mohammad Hossain Bhuiyan)
Supervisor

Dedicated to my

Beloved Parents

LIST OF ABBREVIATIONS OF SYMBOLS AND TERMS

Full Word	Abbreviation
And others (at elli)	*et al.*
Bangladesh Agricultural Research Institute	BARI
Centimeter	cm
Coefficient of Variation	CV
Degree Celsius (Centigrade)	^0C
Etcetera	etc.
Example	e.g.
Gram	g
Hectare	ha
Hour	hr
Kilogram	kg
Meter	m
Namely	viz.
Percent	%
Percent	%
Ton	t

ACKNOWLEDAEMENTS

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ABSTRACT

The main purpose of the research work was to determine the extent of adoption of selected rice production practices by the farmers of char-land of Gomoti River and to explore the relationships between selected characteristics namely, age, level of education, family size, farm size, annual income, organizational participation, extension media contact, cosmopoliteness, innovativeness, attitude towards modern agricultural technology, problems and agricultural knowledge of the farmers and their composite adoption of selected rice production practices (dependent variables). Data were collected from randomly selected one hundred farmers of Luter-char union under Daudkandi upazilla of Comilla district with the help of an interview schedule. Data were collected during 6 July to 18 September, 2005. Appropriate scales were developed in order to measure the variables. Correlation test was used to ascertain the relationships between the concerned dependent and independent variables of the research work.

Majority (53 percent) of the farmers had high adoption while 29 percent had medium adoption and 18 percent had low adoption of selected rice production practices. Among the selected characteristics age, farm size, annual income, extension media contact, innovativeness, attitude towards modern agricultural technology, problems and agricultural knowledge showed significant and positive relationships with their adoption of selected rice production practices. On the other hand, level of education, family size, organizational participation and cosmopoliteness did not show any significant relationship with their composite adoption of selected rice production practices.

Chapter I

INTRODUCTION

1.1 General background

Bangladesh is a developing country with an area of 1, 47,570 sq. kilometres. The major portions of the population live in the rural areas and two-third of her labour forces (68.6 percent) is engaged in agriculture (BBS, 2001). The economy of the country is predominantly agrarian accounting for 21.91 percent of GDP (BBS-2005). So, Agriculture plays a vital role in employment, poverty alleviation, food security, standard of living and increase of earnings.

The population of Bangladesh is 137 million with a growing rate of 1.48 percent per annum and 76.61 percent of the population live in the rural areas and its population density is 928 per sq. kilometres (BBS, 2005). It is Asia's 5th and world's 7th most populous country. The per capita income is about $ 470 and its people have a life expectancy of 64.9 years (BBS, 2005).

Rice plays an important role in the economy of Bangladesh. The country is approaching near to the self-sufficiency in rice production still there is some shortage of food. The country imports 0.88 million tons of food spending TK 7192.8 million ($1.24 million) almost every year (BBS, 2005). At least for food security purpose the rice production should be increased continuously. About 80% of the total cultivable land is covered with rice which is about 9.95 million hectare (Biswas *et al.* 1996).

Quoted from FAO Shameem Kamal (1998) stated that Bangladesh is the fourth largest rice producing country in the world, following China, India and Indonesia (FAO, 1995). Per capita consumption of rice is also higher in Bangladesh. In Bangladesh a person on an average uptake 150 kilo of milled rice annually. People obtain 75% calorie from rice alone. This ratio is the highest in the world. It is revealed from the data furnished in the table 1.1 that per unit production of rice is the second lowest in Bangladesh among the rice producing countries.

Table 1.1 Top paddy producing countries in the world

Sl no	Country	Area (000'ha)	Paddy yield (kg/ha)	Output (000'mt)
1	China	31107	6022	187334
2	India	42910	2784	119442
3	Indonesia	11439	4349	49744
4	**Bangladesh**	9952	**2653**	26399
5	Vietnam	6766	3690	24964
6	Thailand	9020	3243	21130
7	Myanmar	6144	3185	19568
8	**Japan**	2118	**6343**	13435
9	**Brazil**	4374	**2565**	11226
10	Philippines	3759	2804	10541
11	United States of America	1252	6301	7887
12	Republic of Korea	1056	6007	6343

Source: FAO, 1996, (in K.M. Shameem kamal, 1998)

Table 1.2 Area, yield rate and production of rice in the year 1994-'95

Season	Rice variety	Area (ha)	Yield (kg/ha)	Production (000' M tons)
Aus	Local	1249390	872	1089
	HYV	412960	1692	698
	Pajam	2430	1646	4
	Total	1664780	1404	1791
Aman	B. Local	955870	946	903
	T. Local	2493120	1250	3117
	T. HYV	1864777	2119	3953
	T. Pajam	282591	1877	531
	Total	5596358	1548	8504
Boro	Local	254250	1326	338
	HYV	2367206	2582	5662
	Pajam	42914	2050	88
	Total	2664370	1986	6538
Total	Rice	9925508	1646	16833

Source: BBS, 1997 (In Shameem Kamal, 1998)

Comparatively the table 1.1 & 1.2, it is seen there is a wide gap in production level of rice among the other rice production countries with Bangladesh. For this low production, Bangladesh has been suffering huge food storage. So there is a great opportunity to increase

per unit production level of rice to get rid of this shortage but now the question is how it could face? The answer is to increase the area under modern varieties along with other agricultural technologies. Forty five percent of the rice area is still under low yielding varieties. Modern varieties so far developed by National and International Research Institutes do not suit all production environments which is one of the most important reasons for non-adoption of modern varieties (Chowdhury *et al.*, 1997). So modern varieties have more production potential and high adaptability to the environment should be adopted by the farmers of all areas of Bangladesh including char-lands.

The majority of the farmers of char-land of Bangladesh are illiterate. They have little communication facilities with developed areas. Reasonably they do not have well exposure with modern agricultural technologies except some HYV of rice varieties such as BR-3, BR-8, BR-28 and BR -29. Infact only the HYV of rice seeds can not ensure high production. Cultivation of HYV of rice consists of a package of technologies such as quality seeds, raising of seedling, balance dose of fertilizers, insect and disease control, etc. Unless the farmers of char-land adopt the entire package of rice production technologies the yield is supposed to be below the national average. The per hectare rice production in char-land is estimated to be below three tons per hectare against national average five ton per hectare. So the people of char-land are very poor and live hand to mouth. There is an urgent need to adopt modern rice production technology along with HYV of rice by the people of char-land.

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According to Rogers (1995), "Adoption is a decision to make full use of an innovation as the best course of action available". Ray (1995) also said that when an individual takes up a new idea as the best course of action and practices it, the phenomenon is known as adoption. The adoption of selected rice production practices by the farmers of char-land must be in the line of definition.

The success of rice production technologies depends on its dissemination among the potential users, which ultimately is measured by the level of its adoption. It is assumed that notable improvements can take place in rice production system among the farmers of char-land if farmers adopt the package of technologies properly.

Generalization from studies conducted at home and abroad regarding the adoption of innovations may not be always applicable due to considerable variation in attributes of the innovations and for various other factors. It will be necessary to have a clear understanding of the present status of adoption of selected rice production practices by the farmers. Therefore, there is necessary to conduct a study on adoption among especial community such as farmers of char-land of Gomoti -River.

1.2 Statement of the problem

The adoption of any practices depends on its dissemination among the potential users; this ultimately is measured by the level of adoption of those practices. It is assumed that notable improvements can take place in Bangladesh agriculture if the available practices are accepted and adopted by the farmer. Among various technologies, BR-3, BR-8, BR-28 and BR-29 are quite suitable for our sustainable agriculture.

For wider adoption of selected rice production practices, it is necessary to have a clear understanding of the present status of adoption of selected rice production practices by the farmers. It is also necessary to have an understanding of the facts, which contributed to adoption of selected rice production practices. An understanding of the relationship of farmers' adoption behaviour with their selected characteristics as well as the problems faced by the respondents will be helpful to the planners and extension workers.

Considering the needs for understanding the confusing of the farmers, the researcher undertook a study entitled, "Adoption of selected rice production practices by the farmers of char-land of Gomoti River". The important purpose of the study was to have an understanding on the adoption of selected rice production practices by the farmers and about some selected factors contributing in the adoption of selected rice production practices. For conducting the research in a planned and appropriate way, the researcher put forwarded the following research questions:

- What were the selected rice production practices that have been adopted by the farmers for rice cultivation in the char-land of Gomoti- River?

- What were the problems faced by the farmers in adopting selected rice production practices?

- To what extent the farmers had adopted the selected rice production practices?

- What were the farmers' selected characteristics having relationships with the adoption of selected rice production practices by the farmers?

1.3 specific objectives

Keeping in view the questions stated above the following specific objectives were formulated for giving proper direction to the study-

i. To identify the rice production practices used by the farmers of char-land of Gomoti River.

ii. To determine and describe some selected personal, socio-economic and psychological characteristics of the farmers.

iii. To determine the extent of adoption of selected rice production practices used by the farmers.

iv. To explore the relationships between the selected characteristics of the farmer's and their extent of adoption of selected rice production practices.

1.4 Justification of the study

In Bangladesh, the deficit of food grains is a chronic problem due to massive population pressure. So, to ensure adequate food supply, it is necessary to give thrust to increase food production using selected rice production practices. Agricultural intensification for minimizing food shortage and maximizing self-sufficiency in food production is possible only when adoption of selected rice production practices and their application skills create positive impact on the behaviour of ultimate users.

Several research institutes have developed a good number of modern agricultural technologies but so far farmers have adopted a few of them. Technical, biological, environmental and socio-economic barriers are the main hindrances of technology transfer and adoption of selected rice production practices. Selected rice production practices must be simple, demand driven, locally available, economically feasible and socially acceptable to bring desirable changes in the attitude of the users for their adoption. At present per hectare yield of local variety of rice in Bangladesh is very low but per hectare yield of HYV is comparatively higher than that of local variety. HYV is now available for increasing the adoption of selected rice production practices.

It is obviously true that farmers are the key elements of adoption of selected rice production practices. At present, there is a lack of adequate understanding as to how the characteristics of the farmers influence their adoption of selected rice production practices. These facts indicate the need for an investigation to ascertain the relationships of the characteristics of the farmers with their adoption of selected rice production practices. Findings of this study will therefore, be helpful to the planners and extension workers in planning and execution of programmes for enhancing the yield as production of crops.

1.5 Assumptions and Limitations of the study

1.5.1 Assumptions of the study

"An assumption is the supposition that an apparent fact or principle is true in the light of the available evidence" (Goode, 1945). An assumption is taken as a fact or belief to be true without proof. In this study, the researcher had the following assumptions in mind while undertaking this study.

1. The respondents included in the sample were competent to give proper responses to the queries included in the interview schedule.

2. The researcher who acted as interviewer was well adjusted to the social and cultural environment of the study area. Hence, the data collected by him from the respondents were free from bias.

3. The responses furnished by the respondents were reliable and the respondents truly and freely expressed all facts concerning the adoption of selected rice production practices and their selected characteristics.

4. Views and opinions made by the respondents were representative of the whole population of the study area.

5. The researcher was capable to rate the responses of the farmers with adequate precision.

6. The findings of the study will have general application to other parts of the country where physical, socio-economic and cultural conditions not differ much from the study area.

7. The findings of the study would be useful for planning and execution of the programme in connection with diffusion of selected rice production practices.

8. The measures of the adoption of selected rice production practices by the farmers are normally and independently distributed with their respective means and standard deviation.

9. The adoption of selected rice production practices by the farmers was linearly related with their selected characteristics.

1.5.2 Limitations of the study

The present study was undertaken with a view to having an understanding on the level of adoption of the selected rice production practices by the farmers of char-land of Gomoti River under Daudkandi upzilla. In order to conduct the research in a meaningful and manageable way it became necessary to impose some limitations with regard to certain aspects of the study. Considering the time, money and other necessary resources available to the researcher, the following limitations were observed throughout the study:

i.   The study was confined to Daudkandi upzilla under Comilla district.

ii.   The study was confined mainly to adoption of selected rice production practices by the farmers of Char-land of Gomoti River.

iii. The study focused on the adoption of selected rice production technologies which include BR3, BR8, BRRI Dhan28 and BRRI Dhan29.

iv.   There are many characteristics of the farmers of Char-land of Gomoti River but only ten characteristics of the farmers were selected for investigation in the study. This was done to complete the study within limited resources and time.

v.   Only the general farmers of the char-land who cultivated rice crops were selected for this study.

vi.   The researcher relied on the data furnished by the farmers from their memory during interview.

vii. Population of the present study was kept confined within the heads of farm families in the study area, because they were the decision makers in their respective families in respect of adoption of selected rice production practices.

viii.   Facts and figures were collected by the investigator applied to the situation prevailing during the year 2004-2005.

The findings of the study are considered to be useful for Luter-char under Daudkandi upzilla. However, the findings are also generally applicable to other areas of Bangladesh where the social ecosystem does not differ much from those of the study area. Thus, the findings are expected to be useful to the planners for preparation of programmes for rapid adoption of selected rice production practices by the farmers. The findings may also be helpful to the extension workers of different national building department/ organization to improved their technique and strategy of action for effective working method with the rural people to generate rural employment and to improve rural economy. Finally, there is a great scope for investigation on farmers' adoption of selected rice production practices, because no research work was conducted so far in char-land of Bangladesh.

1.6 Definition of the terms

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

Adoption

Adoption is the implementation of a decision to continue the use of an innovation. According to Rogers (1995), "adoption is a decision to make full use of an innovation as the best course of action available". When an individual takes up a new idea as the best course of action and practices it, the phenomenon is known as adoption (Ray, 1991).

Practices

Practices refer to the combination of knowledge, input and management practices, which are used together with productive resources to gain a desired output (ILEIA, 1991: 3).

Respondents

The persons, who answered questions through an interviewing procedure in a face to face situation for a social survey, are considered to be the respondent. They are the persons from whom a social research worker usually gets most data required for his research work.

Variable

A general indication in statistical research of characteristics that occurs in a number of individuals, objects, groups etc. and that can take on various values, for example the age of an individual.

Selected rice production practices

Selected rice production practices in respect of cultivation of rice crop refer of those practices, which are advocated by some competent authority. For example the selected rice varieties are BR3, BR8, BRRIdhan28, and BRRIdhan29.

Age

Age of a respondent is defined as the period of time in actual years from his birth to the time of interviewing.

Level of education

Level of education was defined as the formal education received up to a certain level from an educational institute (e.g. school, college and university) at the time of interview. Level of education was measured in term of actual years of successful schooling.

Family size

Family size refers to the total number of individuals directly dependent upon the respondent farmers for fooding, clothing, education and for other socio-economic demands. They usually live in the same home and share same kitchen. Family members include respondent himself, his wife, children, brothers, sisters and parents.

Farm size

Farm size refers to the area of land possessed by a farmer through different land tenure system such as own land under own cultivation, land given other as borga, land taken from other as borga, land given lease, land taken as lease etc. Farm size is expressed in terms of hectares.

Annual income

Annual income of a respondent refers to the total earnings receipt from business, land, works, job, and investment etc. during the last fiscal year. It is expressed in Taka

Innovativeness

The term innovativeness refers to the degree to which an individual is relatively earlier in adopting new ideas than the other members of a social system (Rogers 1983). Innovativeness of a respondent was measured on the basis of adoption of ten technologies.

Organizational participation

Organizational participation is referred to the degree to which farmers a takes part in different social organization either as an ordinary member, executive committee member or executive officer with in a specified period of time.

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Problem confrontation

It refers to the extent of problem faced by the farmers in rice cultivation. The possible problems faced by the farmer were determined viewing various aspects of modern agriculture such as modern varieties, recommended seed rate, recommended irrigation, recommended fertilizer dose and pest management.

Agricultural knowledge

It is the extent of basic understanding of the farmers in different aspects of agricultural subject matters i.e. crops, livestock, fisheries, agro-forestry, soil, seed, fertilizer, insects and diseases of crops, high yielding variety etc. Agricultural knowledge of a respondent was measured by counting agricultural knowledge score.

Extension media contact

The term extension media contact refers to ones exposure to influence of different extension media such as interpersonal channels and mass media channels etc.

Cosmopoliteness

It refers to the orientation or exposure or involvement of an individual respondent external to the own social system.

Chapter II

REVIEW OF LITERATURE

The researcher made an elaborate search of available literature for this research. Available literatures were extensively reviewed to find out relevancy with present research work studied home and abroad with a view to develop conceptual framework of the study. The reviews are conveniently presented based on the major objectives of the study. This chapter is divided into three major sections. The first section deals with expert opinions of innovations and past research findings related to the extent of adoption of innovations. The second section deals with expert opinions and past research findings relating to the relationships of the farmers adoption of innovations with their selected characteristics. The last section deals with the conceptual framework of the study. There is also a major section dealing some reviews of problem issues with adoption of modern agricultural technologies.

2.1 Expert Opinions and Past Research Findings Related to the Extent of Adoption of Innovations

This section is divided into two sub-sections. First sub-section deals with expert opinions relating to the extent of adoption of innovations. Second sub-section deals with the past research findings relating the extent of adoption of innovation.

2.1.1 Expert opinions relating to the extent of adoption of innovations

Mahboob (1985) indicated "The technologies will yield no benefit unless they are understood, accepted and used by the farmers". In fact, a considerable number of useful technologies are now available in the different field of agriculture. Notable improvements can take place in Bangladesh agriculture when the available technologies are accepted and adopted by farmers.

Hossain (1987) stated, "If technology is to be made adaptable with the joint efforts of scientists, technologists, extension personnel and farmers, participation of concerned peer group, client groups and their associates are essential. The characteristics of the effective technologies are that they are technically sound, they can be disseminated effectively. they are economically viable and also socially acceptable".

Kashem *et al.* (1990) stated, "The technologies are of no use unless they are used by their potential users".

Okoro *et al.* (1992) stated, "Adoption of the new practices tended to be high for less complex and less readily available ones, while low for relatively more complex and expensive practices".

Hasan (1996) stated, "An increased rate and extent of adoption of selected technologies are vitally important for increasing the yield of field crops, vegetables production and forestry products".

Islam (1996) stated, "Farmers would show higher interest to those technologies where their economic safety is guaranteed".

Chowdhury (1997) stated that the modern varieties of rice so far developed by BRRI and national and international research institutes did not suit all production environments which were one of the most important reasons for non adoption of modern variety (MV) of rice. Therefore, ecosystem oriented research programme should be strengthened.

2.1.2 past research findings relating to extent of adoption of innovations

Hossain (1971) carried out a research study on the adoption of four improved practices in Gouripur of mymensingh district. The practices were (i) plant protection measure, (ii) recommended variety of paddy, (iii) line transplanting and (iv) recommended dose of fertilizer. It revealed that among the respondent farmers, 57.40 percent adopted plant protection measure, 35.51 percent adopted recommended variety of paddy, 25.36 percent adopted line transplanting and 11.52 percent adopted recommended dose of fertilizers.

Karim (1974) carried out a study on the adoption of fertilizers by transplanting Aman growers in former Keyotkhali union of Mymensingh district. He investigated the adoption of three fertilizers- urea, triple super phosphate (TSP) and muriate of potash (MP). He expressed that 4 percent of the respondent growers had high level of adoption of the fertilizers, 9 percent had medium adoption and 41 percent had low adoption. Forty six percent (46) of the remaining respondent growers were non adopters.

Muhammad (1974) studied that extent of adoption of insect control measures by the farmers in Khamar union of Rajshahi district. He found that among the respondent farmers, 25 percent did not adopt insect control measures, 28 percent had high level of adoption, 32 percent had medium level of adoption and 25 percent had low level of adoption.

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Rahman (1974) carried out a research study on the adoption of IR-20 vatiety of paddy in Bhabakhali union of mymensingh district. The study revealed that 29 percent of the rice growers had medium adoption of IR-20 where 21 percent had low adoption and 19 percent had high adoption of IR-20. the 31 percent of the respondent growers were non-adopters.

Razzaque (1977) studied on the extent of adoption of HYV rice in the three villages of Agriculture University Extension Project area. He observed that among the respondent growers, 6.6 percent of the farmers had high adoption of HYV rice, 33.3 percent had medium adoption and 40 percent had low adoption.

Ahmed (1977) carried out the research study on the adoption of three specific practices of jute cultivation in Noapara union of Faridpur district. He found that among the respondent farmers, 98 percent adopted the recommended varieties of jute, 72 percent adopted plant protection measures and 49 percent adopted recommended dose fertilizers.

Hossain (1981) studied on the relationships of the farmers (Jute growers) with their adoption of improved practices of Jute cultivation. He found that more than half (54 percent) of the respondents had medium adoption of the improved practices compared to 31 percent having high adoption and 15 percent low adoption.

Hossian (1983) carried out the research study on the extent of adoption of HYV rice as transplanted Aman and other related aspects in Bhabakhali union of Mymensimgh district. He observed that among the respondent farmers, 54 percent had high adoption of HYV rice and 46 percent had medium adoption of HYV rive as transplanted Aman.

Haque (1984) investigated the research problem on the extent of adoption of improved practices in sugarcane cultivation in selected areas of Jossore district. He observed that 62.75 percent respondent growers adopted early time of planting, 60.75 percent of the respondent growers adopted recommended dose of fertilizers and 54.9 percent respondent growers adopted trench method.

Karim and Mahboob (1986) studied on the adoption of HYV wheat in Kushtia union of Mymensingh district. They found that among the respondent wheat farmers 74 percent adopted HYV wheat cultivation and 26 percent farmers were non-adopters.

Rahman (1986) carried out a research study on the extent of adoption of four improved practices namely, use of fertilizers, line sowing, irrigation and use of insecticides in transplanted Aman rice cultivation in two village of Mymensingh district. It revealed that 22 percent of the respondent farmers adopted all the four practices in combination against 49 percent adopted three practices, 22 percent adopted two practices, 5 percent adopted one practices and only 2 percent had no adopted of those practices.

Naika Rao (1989) found that more area was brought under plant protection chemicals after adoption of recommended plant protection chemicals. The area increased from 45.75 acres to 104.75 acres in adoption villages and from 8 acres to 11 acres in non-adoption villages.

Gogoi and Gogoi (1989) conducted a study on adoption of recommended plant protection practices in rice in Jorhat district of Assam state in India. The recommended practices were seed selection, seed treatment, growing of tolerant or resistant variety, propheletic measures and chemical protection measures. The study revealed that among the respondent, 50 percent

had low level of adoption, 36.36 percent had medium level of adoption and 13.64 percent had high level of adoption of recommended plant protection practices.

Jaliana *et al.* (1991) undertook a study on adoption of integrated pest management practices in five village of vasudevanalhur block in Tirunelvi district, Tamilnadu, India. They found that about 50 percent of marginal farmers, 47.50 percent of small farmers, 52.50 percent of big farmers had medium adoption and 42.50 percent of big farmers, 22.50 percent of small farmers and 5 percent of marginal farmers had high level of adoption. In both cases, big farmers participation in was higher in comparison to other categories of respondent farmers.

Kashem *et al.* (1992) conducted a research study on adoption behaviour of sugarcane growers of Zilbangla Sugar Mill, Dewanganj, Jamalpur, Bangladesh. They found among the respondent growers, that 89 percent had high level of adoption of recommended practices of sugarcane.

Singh *et al.* (1992) undertook a research study in India on factors affecting the adoption of improved sugarcane production technology. They observed that majority of sugarcane growers had the medium level of adoption and were partial adoption of scientific recommendations of sugarcane production technology.

Kher (1992) conducted a study on adoption of improved wheat cultivation practices in selected villages of Rajouri block. He found 72 percent of the respondents had medium level of adoption, 17 percent had low level of adoption and 11 percent had high level of adoption.

Khan (1993) carried out a research study on adoption of insecticides and related issues in the village of Pachon union, Madaripur district. He observed that among the respondent farmers, 7 percent had no adoption, 57 percent had low adoption, 32 percent had medium adoption and only 4 percent had high adoption of insecticides.

Nikhade *et al.* (1993) observed in their study on adoption of improved practices of soybean cultivation that cent percent adopted improved varieties. More than 82 percent had complete adoption of package practices like time by sowing, spacing and intercultural operations. Partial adoption was observed in majority of the soybean growers (74.6 percent) with regard to recommended seed rate.

Hasan (1996) found in his study that the highest proportion (44 percent) of the respondents perceived the existence of medium adoption, compared to 26 percent low adoption and 30 percent high adoption in respect of selected agricultural technologies.

Islam (1996) carried out a study on farmers' use of indigenous technical knowledge (ITK) in the context of sustainable agricultural development. He found in the extent of use of ITK by individual farmers that the highest proportion (42.73 percent) of respondents belonged to the lower user category as compared to 41.82 percent in the moderate user category and 15.45 percent in the higher user category respectively.

2.2 Expert Opinions and Past Research Findings Related to Relationships of Farmers' Adoption of innovations with their selected characteristics

This section is divided into two sub- sections. First sub-section deals with expert opinions relating to the relationships of farmers' adoption of selected innovations with their selected characteristics. Second sub-section deals with the past research findings relating to the relationships of farmers' adoption of selected innovations with their selected characteristics.

2.2.1 Expert opinions relating to the relationships of farmers' adoption of selected innovations with their selected characteristics

Halim (1985) stated that several personal, socio-cultural and institutional factors affected the diffusion of innovations among farmers. He also stated that the tendency was for the better educated, younger, owner cultivators and rich farmers to adopt innovations earlier than others. He again observed that the farmers with characteristics of cosmopoliteness, leadership ability and high organizational participation usually, adopt innovations earlier.

"Adoption of technology is the function of various factors within which a farmer decide to adopt or reject an innovation" (Ali *et al*. 1986)

Saeed (1989) stated that adoption of innovation was more closely related to individual and farm related factors than community and family level variables.

The following factors were identified that contributed to the slow adoption of IPM : (1) institutional factors, (2) economic factors, (3) political factors and other factors: spiritual, moral and IPM itself (Anonymous, 1993).

2.2.2 past research findings relating to the relationships of farmers adoption of innovations with their selected characteristics

2.2.2.1 Age and adoption of innovations

Singh and Ranjendra (1990) in their study on adoption of improved sugarcane variety found that age were to have positive and significant associated of adoption of 767 variety of sugarcane.

Hossain (1991) conducted a study to determine the relationship of farmers' characteristics with their adoption behaviour of improved farm practices in Sadar thana of Jamalpur district. He reported that age of the wheat growers significantly inflienced the adoption of improved farm practices

Pathak and Sasmal (1992) observed that there was positive and significant relationship between the age of marginal farmers and their adoption of jute technology. Similar findings were observed by Ali et al. (1986), Singh and Rejendre (1990), Okoro and Obibuaka (1992) and Kashem and Hossain (1992).

Islam (1993) conducted a study, which concluded that age of potato growers had no significant relationship with the adoption of improved practices in potato cultivation.

Muttaleb (1995) reported that age of the farmers had no relationship with overall adoption of potato technologies.

Pal (1995) conducted a study on adoption of recommended sugarcane cultivation practices by the farmers. He found that age had significant and negative relationship with the adoption of recommended sugarcane cultivation practices. Similar findings found by khan (1993), Hoque (1993), Hasan (1996) and many others.

Shadeque (1995) observed that there was no relationship between age of the farmers and their adoption of improved practices like pollywog planting method of water melon, but rice fish culture had significant relationship with age.

Islam (1996) conducted a study on farmer's use of indigenous technical knowledge (ITK) in the context of sustainable agricultural development. He found that age of the farmers had significant negative relationship with their extent of use of ITK.

Sarker (1997) observed that there was no significant relationship between age and adoption of improved potato cultivation practices. Similar findings were observed by karim and Mahboob (1986), Rahman (1986), Singh (1989), Kher (1992) and chowdhury (1997).

Hossain (1999) conducted a study to determine the farmers' perception of the effects of agro-chemical on environment. He found that age of the farmers had no relationships with their adoption of fertilizer.

Hussen (2001) conducted a study on farmers' knowledge and adoption of modern sugarcane cultivation practices. He found that age of the sugarcane growers had a negative significant relationship with their adoption of modern sugarcane cultivation practices.

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

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

2.2.2.2 Education and adoption innovation

Hossain (1981) in his study found no significant relationship between education of the farmer and their adoption of improved farm practices.

Hossain (1983) in his study found a significant and positive relationship of education of the farmers with their adoption of the selected four improved farm practices.

Haque (1984) conducted that education of cane growers significantly influenced the adoption of improved practices in sugarcane cultivation in some selected areas of Jessore district.

Rahman (1986) in his study found that education had significant and positive relationship with the adoption of improved practices.

Ali *et al.* (1986) in their study found that education had highly significant and positive relation with adoption of improved sugarcane production technologies.

Mustafi *et al.* (1987) reported that education did not have any significant effects on the adoption of HYV varieties of rice in Bangladesh.

Hossain (1991) in his study found a significant and positive relationship of education of the wheat growers with their adoption of improved farm practices.

Hasan (1996) conducted a study on adoption of some selected agricultural technologies among the farmers perceived by the frontline GO and NGO workers. He observed that education have no significant relationship with the perceived adoption of selected agricultural technologies. Similar results were found by Kher (1992), Ali (1993), Islam (1996) and hossain (1999).

Sarker (1997) conducted a study to determine the relationship between selected characteristics of potato growers and their adoption of improved potato cultivation practices in five village of Comilla district. He found that education of potato growers had significant relationship with their adoption of improved potato cultivation practices.

Chowdhury (1997) found a positive significant relationship between the education of the farmers and their adoption of selected BINA technologies. Similar results were found by Halim (1985), Islam (1993), Haque (1993), Khan (1993), hossain *et al.* (1997), Pal (1995) and Ali *et al.* (1986).

Bavalatti and Sundaraswamy (1990) observed no significant relationship between education of the farmers and their adoption of dry land farming practices.

Khan (1993) studied on the adoption of insecticides and related issues in the village of Pachon union. Madaripur district. He observed that education had a significant positive relationship with the adoption of insecticides.

Pal (1995) conducted a study on adoption of recommended sugarcane cultivation practices by the farmers. He found that education had significant and positive relationship with the adoption of recommended sugarcane cultivation practices.

Alam (1997) observed that the level of education of the farmer had a positive and significant relationship with the use of improved farm practices. Sarker (1997) and chowdhury (1997) also found similar findings about the relationship between education and adoption of improved technologies.

Hussen (2001) conducted a study on knowledge and adoption of modern sugarcane cultivation practices. He found that education of the growers had positive significant relationship with their adoption of modern sugarcane cultivation practices.

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice in sadar upazilla of Mymensing district. He found that academic qualification of the farmers had a significant and positive relationship with their adoption regarding Aalok 6291 hybrid rice.

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

Rahman (2003) conducted a study on Environmental impacts of modern agricultural technology diffusion in Bangladesh: an analysis of farmers' perceptions and their determinations. He found that there was positive relationship between education and environmental impacts of modern agricultural technology diffusion in Bangladesh.

2.2.2.3 Family size and adoption of innovations

Hossain (1983) in his study in Bhabakhali union of Mymensingh distract observed that family size of the farmers had no relationship with their adoption of HYV rice as transplanted aman. Though the relationship was not statistically significant, the chi-square value for the relationship was quite large and approaching the level of significance. There was an appreciable trend of the adoption of small family, category being much lower than that in the medium family and the big family categories.

Ali *et al.* (1986) in their study found that adoption of improved sugarcane production techniques significantly increased with increased family size.

Mustafi *et al.* (1987) in their study found that number of family members had no significant effect on adoption of modern varieties of rice in Bangladesh.

Hossain (1991) in his study in Sadar Thana of Jamalpur district obserbed that the family size of the farmers had no significant effect on the adoption of improved farm practices.

Haque (1993) in his study found that family size of the growers had negative and significant relationship with their adoption of improved practices in sugarcane cultivation.

Pal (1995) carried out a research study on adoption of recommended sugarcane cultivation practices by farmers in two selected centre of North Bengal Sugar Mills. He showed in his findings that family size of the respondent farmers had no significant relationship with their adoption of recommended sugarcane cultivation practices. Similar findings were observed by Hossain (1991), Bashar (1993) and Islam (1993).

Chowdhury (1997) conducted a research study on adoption of selected BINA technologies by the farmers of Boira union in Mymensingh district. He observed that family size of the farmers had positive and significant relationship with the adoption of selected BINA technologies. Similar findings were observed by Barkatullah (1985). Okoro and Obibauka (1992), pathak and Sasmal (1992), Ali (1993) and Sarkar (1997).

Islam (1996) conducted a study on farmer's use of indigenous technical knowledge (ITK), in the context of sustainable agricultural development. He found the significant and negative relationship between the family size of the farmers and their extent of use of ITK. Similar

results were found by Haque (1993), Hasan (1996), Igodan *et al.* (1988) and Asaduzzaman (1979).

Hossain (1999) conducted a study to determine the farmer's perception of the effects of agro-chemicals on environment. He found no relationship between the farmer's family size and their adoption of pesticides. Pal (1995), Hossain (1991),

Mustafi *et al.* (1987), Bashar (1993) and Islam (1993) found no significant relationship with family size.

Hussen (2001) conducted a study on farmers' knowledge and adoption of modern sugarcane cultivation practices. He found that the family size of the growers had no significant relationship with their adoption of modern sugarcane cultivation practices.

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

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

2.2.2.4 Farm size and adoption of innovations

ogunfiditimi (1981) found that farm size had a negative correlation to adoption of the new farm practices.

Hossain (1983) found that size of the farm of transplanted Aman farmers in Bhabakhali union of Mymensingh district had a negative relationship with their adoption of HYV T-Aman paddy.

Baadgaonker (1984) observed that size of land holding was significantly related with the adoption behaviour of groundnut cultivations.

Rahman (1986) observed that farm size had significant and positive relationship with adoption of improved practices in transplanted Aman rice.

Ali et al. (1986) found a strong negative relation between farm size and adoption of improved sugarcane production practices.

Gogoi and gogoi (1989) in their study observed that size of land holding of farmers had a significant relationship and positive effect on their adoption of plant protection practices.

Hissain (1991) found that size of farm had no significant relationship with adoption of improved farm practices in wheat cultivation.

Basher (1993) conducted s study on the adoption of intercropping of sugarcane. He observed that there was no relationship between farm size of the farmers and their adoption of sugarcane intercropping.

Khan (1993) in his study observed that the farm size was positively and significantly related to the adoption of insecticides.

Pal (1995) conducted a research study on adoption of sugarcane cultivation practices by the farmers. He observed the significant and positive relationship between the farm size of the respondent farmers and their adoption of sugarcane cultivation practices.

Islam (1996) undertook a study on the extent of farmers' use of indigenous technical knowledge (ITK) in the context of sustainable agricultural development. He found that there was significant and negative relationship between the farm size of the farmers and their extent of use of ITK.

Sarkar (1997) found that farm size of potato growers had a significant positive relationship with their adoption of improved potato cultivation practices. Similar finding between farm size and adoption of selected BINA technologies was also reported by Chowdhury (1997).

Alam (1997) studied the use of improved farm practices in rice cultivation by the farmers. The findings of the study showed that farm size of the farmers had a significant relationship with their use of improved farm practices in rice cultivation.

Hussen (2001) conducted a study on farmers' knowledge and adoption of modern sugarcane cultivation practices. He found that the farm size of the cane growers had a positive significant relationship with their adoption of modern sugarcane cultivation practices.

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice in sadar upazilla of Mymensingh district. He found that farm size of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice

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

2.2.2.5 Annual income and adoption of innovations

Hossain (1981) found in his study a non-significant relationship between income of the farmers and their adoption of improved farm practices.

Hossain (1983) made an investigation in Mymensingh district and found that annual income of farmers had a negative relationship with their adoption of HYV rice as transplanted aman.

Haque (1984) conducted a study on the adoption of improved practices in sugarcane cultivation in Jessore district. The findings of the study indicated that annual income of the cane growers had significantly influenced their adoption of improved practices in sugarcane cultivation.

Singh (1989) in a study found that income of the farmers was significantly associated with the level of adoption of plant protection measures.

Hossain (1991) observed that income had no significant relationship with the adoption of improved farm practices in wheat cultivation.

Hoque (1993) found a negative and significant relationship between farm income and adoption of improved practices in sugarcane cultivation.

Pal (1995) in his study found a positive and significant relationship between income of the farmers and their adoption of recommended practices in sugarcane cultivation.

Chowdhury (1997) found that the annual income of the respondents had a positively significant relationship with their adoption of selected BINA technologies. Similar findings were reported by Sarkar (1997) and Alam (1997) about relationship between annual income and adoption of improved technologies.

Hussen (2001) conducted a study on farmers' knowledge and adoption of modern sugarcane cultivation practices. He found that annual income of the cane growers had a positive significant relationship with their adoption of modern sugarcane cultivation practices.

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice in sadar upazilla of Mymensingh district. He found that annual income of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

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

Rahman (2003) conducted a study on environmental impacts of modern agricultural technology diffusion in Bangladesh: an analysis of farmers' perception and their determinations. He found that annual income of the farmers had a positive relationship with their modern agricultural technologies diffusion in Bangladesh.

2.2.2.6 Organizational participation and adoption of innovations

Hossain (1991) reported the organizational participation had a significant and positive relationship with the adoption of improved farm practices in wheat cultivation.

Kher (1992) carried out a research study on the adoption of improved wheat cultivation practices by the farmers of selected village of Rajouri block, India. He observed that there was no significant relationship between the farmers' social participation and their adoption of improved wheat cultivation practices.

Chowdhury (1997) observed that there was a significant positive relationship between farmers' organizational participation and their adoption of selected BINA technologies. Pal (1995), Karim (1973), Halim (1985), Rahman (1986), Bashar (1993), Islam (1992), Khan (1993), and Haque (1993) observed the similar findings.

Hussen (2001) concluded that organizational participation had positive significant relationship with their adoption of modern sugarcane cultivation practices.

Sarder (2002) observed that the organizational participation of the farmers had no significant relationship with their adoption of IPM practices.

2.2.2.7 Extension contact and adoption of innovations

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

Sarkar (1997) observed a positive and significant relationship between extension contact and adoption of improved potato cultivation practices.

Rahman (1999) found that extension contact of the boro rice farmers had a significant positive relationship with their adoption of balanced fertilizers in boro rice cultivation.

Hussen (2001) conduct a study on farmers' knowledge and adoption of modern sugarcane cultivation practices. He found that extension contact of the growers had significant relationship with their adoption of modern sugarcane cultivation practices.

Rahman (2001) found that extension contact of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

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

2.2.2.8 cosmopoliteness and adoption of innovations

Hossain (1991) conducted a study on the adoption behaviour of contract growers in sadar upazilla of Jamalpur district. He found that there was no significant relationship between cosmopoliteness of the farmers and their overall adoption of improved farm practices. Similar findings were observed by Mannan (1972), Muhammad (1974), sobhan (1974) and Islam (1996).

Haque(1993) observed in his study, a strong positive relationship between cosmopoliteness of sugarcane growers and their adoption of improved practices in sugarcane cultivation.

Islam (1993) found a significant relationship between cosmopoliteness of the farmers and their adoption of recommended dose of fertilizer and plant protection measures in potato cultivation.

Khan (1993) observed in his study on adoption of insecticide and related issues by the farmers, a positive relationship between cosmopoliteness of the farmers and their adoption of insecticides.

Pal (1995) conducted a research on the adoption of recommended sugarcane cultivation practices by the farmers. He observed that the cosmopoliteness of the farmers had significant

positive relationship with their adoption of recommended sugarcane cultivation practices. Similar results were found by Halim (1985), Khan (1993), Haque (1993) and Islam (1996).

Chowdhury (1997) conducted a study on the adoption of selected BINA technologies by the farmers of Boira union in Mymensingh district. He found that there was no significant relationship between the cosmopoliteness of the farmers and their composite adoption of selected BINA technologies. Similar findings were observed by Mannan (1972), Muhammad (1974), Sobhan (1975), Hossan(1991) and Islam (11996).

Hossain(2001) found a positive significant relationship between cosmopolitness of the farmers and their adaption of pesticides. Pal (1995), Halim (1985), Khan (1993), Hoque (1993) and Islam (1996) observed similar results.

Hussen(2001) conduted a study on farmers' knowledge and adoption of modern sugarcane cultivation practices. He found that cosmopoliteness of the growers had significant positive relationship with their adoption of modern sugarcane cultivation practices.

Rahaman(2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice Sadar upazila of Mymensingh district. He found that cosmopoliteness of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

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

2.2.2.9 Innovativeness and adoption of innovations

Moulik *et al.* (1966) observed that innovativeness significantly influenced the adoption of nitrogenous fertilizers among the farmers. They stated that it was in simple term that the more a cultivator exhibited a general tendency towards accepting innovations, the higher would be his adoption score.

Rahman (1973) found a positive relationship between modernism and adoption of farm practices. He defined modernism as leading for new experience or opener to innovation. So, modernism as used by him is synonymous with the innovativeness of the present study.

Muhammad (1974) conducted the study on the extent of adoption of insect control measures by the farmers. He observed a strong positive relationship between innovativeness and adoption of insect control measures.

Rogers (1983) reviewed 2,376 past research studies and postulated 31 generalization of innovativeness. This include among others are personal characteristics and socio-economic characteristics of the farmers. He stated that innovative farmers had more years of education, larger farm size, higher income, more cosmopoliteness, higher organization participation, lower degree of fatalism and higher knowledge in farming. However, age did not yield a consistent relationship with innovation proneness. Hossain *et al* (1992) indicated similar results.

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

Jamal (1996) found no relationship between innovativeness of dropout rural youth with their preference in selected agricultural and non-agricultural entrepreneurship. Similar findings were obtained by Rahman (1995) and Rahu (1989).

Mansur (1989) found a significant negative relationship between the farmer's innovativenees and their problem confrontation in feeds and seedling cattle. Saha (1988) and Ali (1978) supported such findings in their respective studies. Sharma and Sanoria (19830) observed higher average innovativeness among contact farmer than non-contact farmers.

Aurangozed (2002) conducted a study on adoption of integrated homestead farming technologies by the rural women in RDRS. He found that there was a significant relationship between innovativeness and adoption of integrated homestead farming technologies.

2.2.2.10 Attitude towards technologies and adoption of innovations

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

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

Podder (1999) conducted a study on the adoption of Mehersagar Banana by the farmers of Gazipur union under Sakhipur Thana of Tangail district. He found that there was no

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relationship between attitude towards technology of the growers and their adoption of modern agricultural technologies.

2.2.2.11 Agricultural knowledge and adoption of innovations

Most of the researchers found very high relationships between farmers' knowledge on a particular technology and its adoption.

Rahman (1995) in his study observed no significant relationship between farmer adoption of improved practices and their knowledge on improved practices of potato cultivation.

Moullik *et al.* (1996) conducted a study on predictive values of some factors of adopting nitrogenous fertilizers by the north Indian farmers in India. He found a significant positive relationship between agricultural knowledge and adoption of nitrogenous fertilizers among the cultivators.

Alam (1997) observed that agricultural knowledge of the rice growers had significant relationship with their use of farm practices in rice cultivation.

Sarkar (1997) found that potato production knowledge of potato growers had a positive and significant relationship with their adoption of improved potato cultivation practices.

2.3 The Conceptual Framework of the Study

The present study tried to focus two concepts: first, farmer's selected characteristics; and the second, adoption of modern agricultural technologies. Adoption of an individual may be influenced and affected through interacting of many characteristics in his surroundings. It is impossible to deal with all characteristics in a single study. It was therefore, necessary to limit the characteristics which include age, level of education, family size, annual income, agricultural knowledge, extension media contact, cosmopoliteness, innovativeness and attitude towards modern agricultural technology. The conceptual model of the study has been presented below:

Independent variable

Dependent variable

Selected characteristics of farmers

- Age
- Level of education
- Family size
- Farm size
- Annual income
- Agricultural knowledge
- Extension media contact
- Cosmopoliteness
- Innovativeness
- Attitude towards modern agricultural technology
- Problems

Adoption of selected rice production practices by the farmers
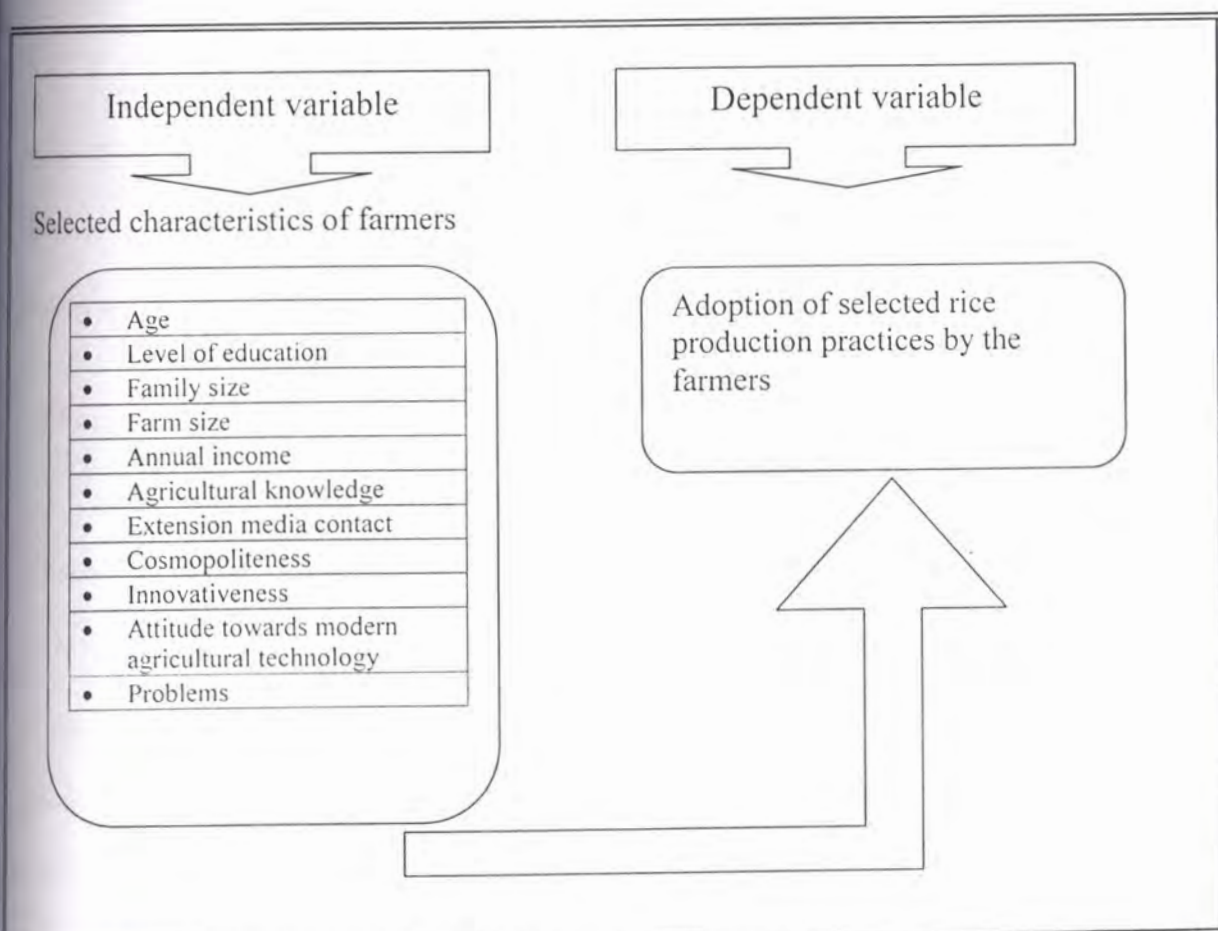
Figure 2.4. The Conceptual Model of the study

Chapter III

METHODOLOGY

Methodology deserves a very careful consideration in conducting scientific research. Importance of methodology in conducting any research cannot be undermined. Methodology enables the researcher to collect valid and reliable information and to analyze them properly to arrive at correct decisions. Keeping this point in view, the researcher took utmost care for using proper methods in all the aspects of this piece of research work. Methods and procedures followed in conducting this study has been described in this chapter.

3.1 Locale of the study

Luter-char a char-land (Islet) of Gomoti River was purposely selected as locale of the study. The char-land is situated in Daudkandi upzilla under comilla district just five kilometers away from the upzilla head quarter. The selected char-land and its physical settings are shown in figure 3.1

3.2 Population and sample of the study

An update list of all farm family heads using only selected rice production practices of the selected village was prepared with the help of Sub-Assistant Agricultural Officer (SAAO) . The list comprised a total of 496 farmers in the study area. These farmers constituted the population of this study. Twenty (20 percent) of the population of the village was randomly selected as sample of population by using a table of Random Numbers (Kerlinger, 1973). Thus, the total sample size of this study area was about one hundred (100) farmers.

UNION GEO-CODE MAP

● **Luter-char Union**
Daudkandi Upazilla

Figure 2. A map of Daudkandi upazilla of Comilla district showing the stydy area

Fig 3.1 Map of Bangladesh showing the thana Doudkandi

In addition to that, two (2 percent) of the population was selected randomly and proportionately of the selected village. Thus, the additional sample, so drawn stood ten (10) farmers, which were included in the population sample in the reserve list. In case the individuals included in the original sample were not available at the time of data collection, the farmers from the reserve list were used for the purpose. The distribution of the farmers included in the population sample and those in the reserve list appears in Table3.1.

Table 3.1 Distribution of population and sample of respondents in the selected village of Luter-char.

Name of the village	Total number of farmers	Sample size	Number of farmers in the reserve list
Luter-char	496	100	10

3.3 Variables of the study:

In a descriptive social research, the selection of variables constitutes an important task. Success of a research to a considerable extent depends on the successful selection of the variables. In this connection, the investigator looked into the literature to widen his understanding about the nature and scope of the variables involved in the research studies. Ezekiel and Fox (1959) stated variable as any measurable characteristics, which can assume varying or different values in successive individual cases.

The researcher keeping in mind took adequate care in selecting the dependent and independent variables of the study. Before selecting variables, the researcher himself visited the study area and talked to the local farmers intimately and he was able to observe the various factors of the farmers, which might have influence on their adoption of selected rice

production practices. Based on this experience, literature for the study, discussion with relevant experts and academicians and also with the research supervisor, the researcher selected the variables for this study.

Two types of variables were concerned with the study such as

i.   Independent variables and

ii. Dependent variables

i.   **Independent variables**: An independent variable is that factor which is manipulated by the experimenter in his attempt to ascertain the relationship to an observed phenomenon. The respondents' selected characteristics viz. age, education, family size, farm size, annual income, organizational participation, cosmopoliteness, innovativeness, attitude towards technology, problem confrontation and agricultural knowledge are selected as independent variables.

ii. **Dependent variables**: A dependent variable is that factor which appears, disappears or varies as the experimenter introduces, removes or varies the independent variables. Adoption of selected rice production practices is selected as dependent variable.

3.4 Measurement of variables

In order to conduct the study in accordance with the objectives, it was necessary to measure the selected variables. This section contains procedures for measurement of both independent as well as dependent variables of the study. The procedures followed in measuring the variables are presented below.

3.4.1 Measurement of independent variables

The selected characteristics of the respondent farmers constituted the independent variables of the study. To keep the research manageable, twelve independent variables were selected for the study. The procedures of measurement of the selected variables were follows:

Age

The age of individual is one of the important factors pertaining to his personality make up (Smith and Zope, 1970) which can play an important role in his adoption behaviour. The age of a respondent farmer was measured by counting the actual years from his birth to the time of interview on the basis of his statement. It was measured in terms of actual years. No fractional year was considered for the study.

Level of education

Education of a respondent was measured on the basis of his ability to read and write or received formal education up to a certain standard. It was expressed in terms of year of schooling. One score was given for passing each level in the educational institution. For example, if the respondent passed the final examination of HSC class, his educational score was given as 12. Similarly if the respondents passed the final examination of class X, his educational score was given as 10. If the respondents did not know how to read and write, his educational score was given as zero. A score of 0.5 was given to a respondent who could sign his name only.

Family size

Family size of a respondent was measured in terms of actual number of dependent members assigning- score one (1) for each member of the family.

Farm size

Farm size of the respondent was measured as the size of his farm (including rice and other crops) on which he continued his farm practices during the period of study. Each respondent was asked to mention the homestead area, the area of land under his own cultivation, own land given to others on borga (share cropping) system, land taken from others on borga system, land given to others on lease system, land taken from others on lease system, own pond, own garden and miscellaneous fallow land. The area was estimated in terms of full benefit to the farmers or his family. The following formula was used in measuring the farm size:

Farm size= $A_1 + A_2 + 1/3(A_3+A_4) + A_5+A_6+A_7+A_8$

Where,

A_1 = homestead area

A_2= Own land under own cultivation

A_3= Own land given to others on borga system

A_4= Land taken from others on borga system

A_5= land taken from others on lease system

A_6 = Own pond

A_7 = Own garden

A_8 = Miscellaneous fallow land.

The unit of measurement was in hectares.

N. B In share cropping the landowner in Luter-char get one third of the total production.

Annual income

Annual income of a respondent was measured on the basis of total yearly earning from Agricultural and non-agricultural sources (business, service etc) earned by the respondent himself and other family members. The incomes from different sources were ascertained in three phases.

1. In the first phase, the yield of all the crop in the previous year was noted, then all the yield were converted into cash income according to the prevailing market price.

2. In the second phase, the cash income by selling cattle heads, milk and milk products, poultry and its products, fisheries etc according to prevailing market price.

3. In the third phase, earnings of each respondent himself and other members of his family from different sources (like service, business, labour) in the last year from farming and others sources were added together to obtain total family annual income of the respondent.

* Total annual income = A+B+C

Where,

A = Annual income from Agricultural crops

B = Annual income from livestock, poultry & fisheries

C = Annual income from service, business & labour

Based on the annual income the respondents were classified into the following categories.

Low income   = up to 50000/-

Medium income = 50001/- – 90000/-

High income   = above 90000/-

Organizational participation

Organizational participation of a respondent was measured by his membership in different organization for a particular period of time. This was measured by participation of a respondent in an organization. For participation, weight was assigned as 0, 1, 2 and 3 for no participation, general member, executive member and executive officer respectively. Than these scores were multiplied by number of years, the respondent participated in the respective organization. If a respondent is a general member of a cooperative society, executive member of social committee and executive officer of a sports club for subsequent two years, his score of the organizational participation would be: $1 \times 2 + 2 \times 2 + 3 \times 2 = 12$

Extension Media Contact

Extension media contact refers to one's exposure to the influence of extension program through different communication media and sources. The extension media contact of a respondent was measured by computing an extension contact score on the basis of his extension contact with eighteen selected extension media. The respondents mentioned the nature of his contact by putting a tick mark against any one of the five responses –no contact, rarely, sometimes, often, regularly. The score for each respondent was determined by adding his response to all the items on the basis of his frequency of contact with a score of 0, 1, 2, 3, and 4 respectively. The extension media contact score of the respondents could range from 0

to 72, where 0 indicating no extension media contact and 72 indicating very high extension media contact.

Cosmopoliteness

Cosmopoliteness refers to the degree to which a respondent's orientation is external to his own social system. Cosmopoliteness of a respondent was measured in terms of his nature of visits to the eight different types of places as shown in item number 8 in the interview schedule. The cosmopoliteness was measured by assigning score 4 for regular practices, 3 for often practices, 2 for occasional practices, 1 for rare practices and o for no practices. The cosmopoliteness score of the respondents could range from 0 to 32, where 0 indicating no cosmopoliteness and 32 indicating high cosmopoliteness.

Innovativeness

Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in a social system (Rogers; 1995). In this study innovativeness of a respondent was measured on the basis of the earlier or later adoption of 10 improved agricultural practices (Appendex A: item no. 9). The scores were assigned on the basis of time required by an individual to adopt each of the practices in the following manner:

Name of practices	Period of adoption	Assigned score
HYV of Rice	Within One year after hearing	5
	Within Two years after hearing	4
	Within Three years after hearing	3
	Within Four years after hearing	2
	Within Five years or above after hearing	1
	Not at all	0

Innovativeness score of a respondent farmer was obtained by adding his scores for adoption of all the 10 selected improved agricultural practices. Innovativeness score of a respondent farmer could range from 0 to 50, where, 0 indicating no innovativeness and 50 indicating very high innovativeness.

Attitude towards Modern Agricultural technology

An attitude may be defined as predisposition to act towards an object in a certain manner. Attitude of a farmer towards modern agricultural technology was used to refer to his belief, feelings and action towards the various aspects of modern agricultural technology. It was measured by constituting eight statements (four positives and four negatives). A statement was considered positive if it possessed an idea favourable towards the modern agricultural technology. On the other hand, a statement was considered negative if it was unfavourable towards the modern agricultural technology. The respondents were asked to express their opinion in the form of "strongly agree", "agree", "undecided", "disagree", "strongly disagree". A score of 4 was given to "strongly agree",3 to "agree", 2 to "undecided", 1 to "disagree", and 0 to "strongly disagree" for a possible statement. A reverse scoring method was followed in case of statements considered negative. Attitude score of a respondent was determined by summing the scores obtained by him for all the items in the scale. The attitude towards modern agricultural technology score of respondents could range from 0 to 32, while 0 indicating very unfavourable and 32 indication very favourable attitude towards modern agricultural technology

Problems

Farmers in the study area might have faced various types of problems in the way of adopting selected rice production practices. But the investigator gained an experience through personal contact regarding common problems faced by the respondents before collection of data. Besides, the researcher gained experience through consultation with experts and reviewing previous research findings. Finally, he prepared a list of eleven possible problems in this regard. A scale was prepared to indicate the extent to which each of the eleven problems was applicable in case of a respondent. Each respondent expressed the seriousness of the problems by assigning 3, 2, 1 and 0 for high, medium low and not at all problem respectively.

The problem score of a respondent could ranged from 0-33, while 0 indicating no problem and 33 indicating very high problem.

Agricultural knowledge

Agricultural knowledge of an individual was referred to the extent of knowledge about crops, livestock, fisheries, forestry etc. Agricultural knowledge of a farmer is the foundation of his farming business and is a very important factor in one's adoption behaviour either for acquiring or disseminating ideas, practices, technologies, information etc. Knowledge is power and it inspires one to take correct and prompt decision. Without proper knowledge a farmer can take wrong decision which may lead him to failure in the business.

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To measure the agricultural knowledge of a respondent a set of 20 questions was constructed in the interview schedule (Appendix A: item no. 12). Each respondent was asked to answer all the 20 questions. Out of assigned scores against each question, the summation of obtained scores against 20 questions represented the agricultural knowledge of a respondent.

Agricultural knowledge was measured by the total knowledge score about agriculture. The total assigned score was 50. But, the score of each question was not equal; it was assigned according to the extent of difficulty. However, for correct responses to all question, a respondent could get full score, while he could get zero (0) score for wrong answer. Partical score was given for partically correct answer. Thus agricultural knowledge score of a respondent could range from 0-50, while 0 indicating very low knowledge and 50 indicating very high agricultural knowledge.

3.4.2 Measurement of dependent variables

The procedure followed in measuring the dependent variable is presented below:

Adoption of selected rice production practices

Adoption of selected rice production practices was measured by computing adoption quotient. It was calculated by asking farmers how many Boro rice technologies they adopted for how many years in how much land. The land area used for certain technology is considered to be the extent of adoption (e), whereas the area that could be used for the technology is considered to be potentiality of adoption (p). The extent of adoption (e) was divided by potentiality of adoption (p) against each of the technologies. The result is called

Adoption Quotient (AQ). The adoption quotient of each technology for each year was summated. The total score was then divided by the years of use of adopted practices. This is called Mean Adoption Quotient (MAQ). Adoption of selected rice production practices was measured by Mean Adoption Quotient as the following formula.

$$MAQ = \dfrac{\dfrac{\sum e/p}{y}}{n} \times 100$$

Where,

e = Extent of adoption

P = Potentiality of adoption

y = Years of use of adopted practices

n = number of practices

Using above formula, MAQ was computed against each technology for individual farmers (Bhuiyan, 2005). To determined the adoption of selected rice production practices.

MAQ of all individual technology was summated and divided by the number of practices. Thus adoption of selected rice production practices score of a respondent could range from 0-100, while 0 indicating no adoption and 100 indicating highest adoption

For example,

Mr. Abdul latif is a Boro rice grower. He used BR28 in 2002-2003, 2003-2004 and 2004-2005 in the land area of 0.6h, 0.4h and 0.5h respectively.

He used IPM to control insect and diseases of BR28 rice field during the same period in the land area of 0.4h, 0.3h and 0.3h respectively.

He also adopted recommended doses of fertilizer for the same period in the land area of 0.5h, 0.4h and 0.4h respectively. He had potentiality of adoption of BR28 in the land of 0.8h. In the following way the adoption score was calculated.

Sl. No	Name of technology	Year wise adoption in hectare			$\sum e/p$ y	Mean of $\dfrac{\sum e/p}{y}$
		2002-2003	2003-2004	2004-2005		
1	Potentiality of adoption (p) of BR28	0.8	0.8	0.8		
	Extent of adoption of BR28 (e)	0.6	0.4	0.5	**0.625**	
	e/p	**0.75**	**0.5**	**0.625**		
2	Potentiality of adoption (p) of IPM	0.6	0.4	0.5		**2.175**
	Extent of adoption of IPM (e)	0.4	0.3	0.3	**0.67**	
	e/p	**0.67**	**0.75**	**0.6**		
3	Potentiality of adoption (p) of RFD	0.6	0.4	0.5		
	Extent of adoption of recommended dose of fertilizer (e)	0.5	0.4	0.4	**0.88**	
	e/p	**0.83**	**1**	**0.8**		

So $\quad$ MAQ $= \dfrac{2.175}{3} \quad$ X $\quad$ 100

$\qquad = 72.5$

3.5 Statement of Hypothesis

As defined by Goode and Hatt (1952). "A hypothesis is a proposition which can be put to a test to determine its validity. It may seem contrary to, or in accord with common sense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test". A hypothesis simply means a more assumption or some supposition to be proved or disproved. But for a researcher, hypothesis is a normal question that he intends to resolve. According to kerlinger (1973), "A hypothesis is a conjectural statement of the relation between two or more variables. Hypotheses are always in declarative statements form, and they relate either generally or specifically variables to variables". Hypotheses may be broadly divided into two categories, namely, research hypothesis and null hypothesis. In studying relationships between variables, an investigator first formulates research hypotheses which states anticipated relationships between the variables. However, for statistical test it becomes necessary to formulate null hypothesis. A null hypothesis states that there is no relationship between concerned variables.

The null hypotheses were developed in this study to explore the relationship between dependent and independent variables. The following null hypotheses were formulated to explore the relationships of the selected characteristics of the farmers with their adoption of selected rice production practices.

"There was no relationship between the farmers' selected characteristics and their adoption of selected rice production practices".

The characteristics were: age, level of education, family size, farm size, annual income, agricultural knowledge, extension media contact, cosmopoliteness, innovativeness and attitude towards selected rice production practices.

3.6 Collection of data

For the purpose of data collection, an interview schedule was prepared. It was prepared keeping the objectives of the study in mind. The schedule contained both open and closed from questions. Direct simple questions were included in the schedule to collect data on the selected dependent and independent variables. Appropriate scales were developed to measure the selected factors of the respondents. Scales were also developed to ascertain the problems of the respondents in adopting modern rice production practices. The draft schedule was prepared in Bengali and pre-tested before using it for collection of data. Fore pre-test purpose, ten farmers taking from the selected village of the study area was interviewed by using the draft interview schedule. Based on the pre-test experience, necessary corrections, additions, alternations and rearrangements were made in the schedule. Thus, the schedule was prepared for final use. The schedule was prepared both in Bengali and English version. The Bengali version of interview schedule was multiplied as per requirements to collect data from the respondents. The English version of interview schedule was enclosed in appendix- A.

Data were collected personally by the researcher himself through face to face visit to all the selected farmers of Luter-char village of Daudkandi upazilla to obtain valid and pertinent information. The researcher made all possible efforts to explain the purpose of the study to the farmers. Rapports were established with the farmers prior to interview and the objectives were clearly explained by using local language to the extent possible. So he did not hesitate to furnish proper responses to the questions and statements which were collected during 6th July to 18th September, 2005. At the time of data collection, the researcher was also aware of side talking and tried to avoid that problem tactfully. The researcher sought the help of the local supervisors for this purpose. Excellent co-operation and co-ordination were obtained from all the respondents.

3.7 Processing of data

The collected raw data were examined thoroughly to find out the errors and omissions. For this, the researcher made a careful scrutiny of the completed interview schedule to make sure that they were entered as complete as possible and well arranged to facilitate coding and tabulation. Very minor mistakes were detected by doing this, which were corrected promptly.

Having consulted with his research supervisor, the investigator prepared a detailed coding plan. All responses in the interview schedule were given numerical coded values. Local units were converted into standard units. All the individual responses to the questions of the interview schedule were transferred to a master sheet to facilitate tabulation.

In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative forms. These were then tabulated according to the objectives of the study.

For describing the various independent and dependent variables, the respondents were classified into various categories and arranged in simple table for description. These categories were developed for each of the variable by considering the nature of distribution of the data and the general consideration prevailing in the social system. The procedure and the effect of categorization of a particular variable were discussed while describing the variable in the subsequent sections.

3.8 Statistical Analysis

The collected data were compiled, coded tabulated and analyzed in accordance with the objectives of the study. Qualitative data were quantified by means of suitable scoring techniques. The statistical measures such as range, mean, standard deviation, percentage distribution and rank order were used to describe both the dependent and independent variables. Tables were also used in presenting data for clarity of understanding. In order to explore the relationships of the selected characteristics of the farmers with their adoption of modem agricultural technologies, the Pearson's Products Moments Correlation Co-efficient was computed. Correlation matrix were also computed to determined the inter relationship among the variables. One (0.01) and Five (0.05) percent level of significance with relevant the degrees of freedom considered to reject or accept the null hypothesis.

Chapter IV

FINDINGS AND DISCUSSION

The findings of the study and interpretations of the results have been presented in this chapter. These are presented in four sections according to the objectives of the study. The first section deals with identifying the rice production practices used by the farmers of char-land, while the second section deals with the selected characteristics of the farmers. The third sections deals with the adoption of selected rice production practices. The last one deals with the relationships between the extent of adoption of selected rice production practices and the selected characteristics of farmers.

4.1. Section I: Identification and selection of rice production practices

The term rice production practices referred to the practices related to rice production, namely, cultivation of modern variety of rice, use of green manure, use of compost, use of granular urea, use of mixed fertilizer, use of power tiller, use of weedicide, methods used for controlling diseases and insects in rice field etc. In a broad sense, rice production practices refer to the production technologies of rice by judicious use of the resources of nature and different innovations.

For identifying rice production practices by the farmers, the researcher arranged a Focus Group discussion (FGD) with the local farmers and DAE personal including the researcher himself. After thorough discussion the following practices were identified those were practiced by the farmers of the study area

1. HYV Boro rice varieties (BR3/ BR8/ BRRI dhan 28/ BRRI dhan 29)
2. Integrated Pest Management
3. Recommended Doses of Fertilizers.

These practices were selected for the present study

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4.2. Section II: Facts on selected characteristics of the farmers

Twelve characteristics of the farmers were selected to find out their relationship with the adoption of selected rice production practices. The selected characteristics included their age, level of education, family size, farm size, annual income, organizational participation, extension media contact, cosmopoliteness, innovativeness, attitude towards modern agricultural technology, problems, agricultural knowledge. These characteristics of the farmers have been described in this section. Distribution of the farmers according to their different characteristics has been presented in Table 4.2 (II)

4.2.1. Age

Age of the farmers was determined by the number of years from his birth to the time of interview. It was found that the age of the respondents ranged from 17 to 80 years, the average being 50.46 years and the standard deviation was 14.24. On the basis of age, the farmers were classified into three categories: "young aged" (up to 35), "middle aged" (36-60) and "old aged (61 and above). Table 4.2.1 contains the distribution of the respondents according to their age.

Data presented in table 4.2.1 indicated that the highest proportion (57 percent) of the respondents fell in the middle-aged category compared to 17 percent young and 26 percent old aged category. It was also revealed that 74 percent of the respondents comprised of either young or middle-aged categories. Islam, M.S. (2002), Hussen (2001) and Bashar (1993) also found the similar findings in their study.

Table 4.2.1 Distribution of the respondents according to their age

Category	Frequency	Percent	Observed ranged	Mean	Standard deviation
Young aged (up to 35)	17	17			
Middle aged (36-60)	57	57	17-80	50.46	14.24
Old aged (61 and above)	26	26			

Conclusion can be drawn that young and middle-aged farmers are generally receptive to new ideas and things. They have a favourable attitude towards trying of new ideas. However, the older farmers because of their longer farm experience might have valuable opinions regard to adoption of selected rice production practices. The extension agents can make use of these views and opinions in designing their extension activities.

4.2.2 Level of education

Education of a respondent was measured by the level of his formal education i. e. highest grade (class) passed by him. The education score of the respondents ranged from 0 to 11, the average being 1.80 and the standard deviation was 3.07. Based on their level of education, the respondents were grouped into five categories, "no education" (0), "can sign only" (0.5), "primary education" (1-5), "secondary education" (6-10), and above secondary education" (11 and above).

Data presented in Table 4.2.2 indicate that a large proportion (52 percent) of the respondents fell under category of "no education" compared to 22 percent "can sign only", 11 percent having "primary education", 14 percent having "secondary education" and 1 percent having "above secondary education". As education can enlighten a family, it may contribute to the adoption of rice production practices.

Table 4.2.2 Distribution of the farmers according to the their level of education

Categories	Frequency	percent	Observed ranged	Mean	Standard deviation
Illiterate (0)	52	52			
Can sign only (.50)	22	22			
Primary education (1-5)	11	11	0-11	1.80	3.07
Secondary education (6-10)	14	14			
Above secondary education (11 and above)	1	1			

The above picture of education of Luter-char is frustrating as compared to national average literacy. 'Can sign only is not an education. So 77 percent of Luter-char people are illiterate. One should not be wondered if there is no adoption of selected rice production practices in Luter-char. Considering the level of education the Department of Agricultural Extension should take necessary steps to increase the adoption of selected rice production practices in Luter-char.

4.2.3 Family size

The family size of the farmers ranged from 2 to 18 members, the average being 6.66 with a standard deviation 2.67. On the basis of their family size, the respondents were classified into three categories: "small family" (up to 4 members), "medium family" (5-7 members) and "large family" (above 8). Table 4.2.3 shows the distribution of the respondents according to their family size.

Data presented in Table 4.2.3 indicate that 15 percent of the respondents belonged to the "small family" category compared to 62 percent belonged to "medium family" category and 23 percent to "large family" category.

Table 4.2.3 Classification of the farmers according to their family size

Category	Frequency	percent	Observed ranged	Mean	Standard deviation
Small family (up to 4 members)	15	15			
Medium family (5-7 members)	62	62	2-18	6.66	2.67
Large family (8 and above members)	23	23			

This finding indicates that more than three fourth of 77 percent of the respondents had either small or medium family size. The data also indicate that the average family size (6.66 percent) of the respondents of the study area was higher than the national average of 5.4 (BBS. 1995). This may be due to the lack of proper adoption of family planning measures among the respondents or to prevalence of joint family in the study area. Another reason was that the national average of 5.4 persons per family was concerned with rural and urban families, but the present study is concerned with the rural families only.

4.2.4 Farm size

Farm size was measured on the basis of the cultivated area either owned by a farmer or cultivated on borga system, the area being estimated in terms of full benefit to the farmers. The farm size varied from 0.13 to 2.83 hectares. The average farm size was 0.87 hectares with a standard deviation of 0.56. The respondents were classified into three categories based on their farm size as followed by DAE (DAE. 1995): "small farm" (up to 0.54 ha), "medium farm" (.54-.1.21 ha), and "large farm" (1.21 and above). The distribution of the respondents according to their farm size shown in Table 4.2.4

Data presented in the table 4.2.4 show that the highest proportion (38 percent) of the farmers had medium farm compared to 37 percent had small farm and 25 percent having

large farm. It may also be revealed that 75 percent of the respondents comprised of either small or medium farm. Ahmed (1974) also found the similar findings in their study.

Table 4.2.4 Distribution of the farmers according to their farm size

Categories	Frequency	percent	Observed ranged (ha)	Mean	Standard deviation
Small farm (up to .20 ha)	37	37			
Medium farm (.21-.50 ha)	38	38	0.13-2.83	0.87	0.56
Large farm (.51 ha and above)	25	25			

The average farm size of the respondent farmers was 0.87 hectares, which is higher than the national average (0.81 hectares). Government Extension Development Agencies and Non- Government Organization (NGO) should pay attention to initiated programme for small and medium farm holders on priority basis because those two categories were combined the major section of the farmers in the study area.

4.2.5 Annual income

Annual income was estimated on the basis of total receipt of money, goods and services during a year and expressed in taka. Annual income of the respondent ranged from TK.12.00 thousand to TK. 724.360 thousand. The average annual income was TK 109.647 thousand and standard deviation 87.810. On the basis of annual income, the respondents were classified into three categories: "low income" (up to TK. 50.00 thousand), "medium income" (TK. 50.001-90.00 thousand) and "high income" (above 90.00 thousand). The distribution of the respondents according to their annual income is shown in Table 4.2.5

Data shown in Table 4.2.5 revealed that highest proportion (48 percent) of the respondents had high annual income compared to 40 percent having medium and 12 percent under low annual income.

4.2.5 Distribution of the respondents according to their annual income

Category	Frequency	percent	Observed ranged	Mean	Standard Deviation
Low income (up to 50000)	12	12			
Medium income (50001-90000)	40	40	12000-724360	10964 7.50	87810.00
High income (above 90000)	48	48			

The average annual income of the farmers of the study area is much higher than the average per capita annual income of the country i. e. 470 U. S. dollar (BBS, 2005). This might be due to the fact that the farmers of the study area were not engaged in agriculture only. They also earn from other sources such as service, business etc. farmers of low income generally hesitate to adopt innovation in their own farm because of their lower risk bearing ability and their inability to make necessary financial investment. It is. therefore. likely that a considerable proportion of the respondents/farmers might face difficulties in adopting selected rice production practices

4.2.6 Organizational participation

Organizational participation scores of the respondents were computed on the basis of the extent of participation in different organizations. Organizational participation of the respondents ranged from 0 to 5.00. The average was .49 with a standard deviation 1.01against the possible range of 0 to 18. On the basis of organizational participation, the

farmers were classified into three categories: "no participation" (o), "very low participation" (1-4), "low participation" (5 & above).

Data presented in the table 4.2.6 show that the highest proportion (74 percent) of the respondents had no participation in organizations compared to 25 percent having very low organizational participation and only 1 percent of the respondent had low organizational participation.

4.2.6 Distribution of the respondents according to their organizational participation

Category	Frequency	percent	Observed ranged	Mean	Standard Deviation
No participation (0)	74	74			
Very low participation (1-4)	25	25	00-5.00	0.49	1.01
low participation(5 & above)	1	1			

The findings indicate that most of the farmers (99 percent) had either no participation or very low participation. Ahamed (1974) also found (89 percent) of the farmers had either no participation or low participation. It is to be mentioned hare that the people of Luter-char had also education lower than national average. Luter-char being an islet and isolated area existence of government and non-government organization was almost nil except a few local organizations. However, GO and NGO should come forward for the socio-economic development of luter-char.

4.2.7 Extension Media Contact

Extension contact scores of the farmers were computed on the basis of their extent of contact with 18 sources of extension information. The compute extension media contact

scores of the respondents ranged from 0 to 17 with an average 7.62 and the standard deviation of 3.25 against the possible range of 0 to 72. On the basis of extension media contact scores, the respondents were classified into three categories: "no extension contact" (0). "very low extension contact" (1-9) and "low extension contact" (10 and above). The distribution of the respondent according to their extension media contact is shown in Table 4.2.7

Table 4.2.7 Distribution of the respondents according to their extension media contact

Categories	Frequency	percent	Observed ranged	Mean	Standard deviation
No extension contact (0)	2	2			
Very Low extension contact (1-9)	70	70	0-17	7.62	3.25
Low contact (10 and above)	28	28			

Data presented in Table 4.2.7 indicate that the highest proportion (70 percent) farmers of the study area had very low extension media contact, while 28 percent had low extension media contact and 2 percent had no extension media contact.

The findings of the study indicate that most of the respondents (98 percent) had very low and low extension media contact with various information sources for getting necessary agricultural information. Bashar (1993), Pal (1995), Hussen (2001) and Islam (2002), observed almost the similar findings for getting necessary agricultural information.

4.2.8 Cosmopoliteness

Cosmopoliteness scores of the respondents ranged from 0 to 13 against the possible range of 0 to 32 with an average 5.76 and standard deviation of 2.60. On the basis of their cosmopoliteness scores, the respondents were classified into three categories: "very low cosmopoliteness" (up to 5), "low cosmopoliteness" (6-10), "medium cosmopoliteness"

(above 10). The distribution of the respondents according to their cosmopoliteness is shown in Table 4.2.8.

Data contained in Table 4.2.8 indicate that the highest proportions (53 percent) of the respondents were "low cosmopoliteness", while 43 percent of the being "very low cosmopoliteness", and only 4 percent under "medium cosmopoliteness". Data also revealed that majority (96 percent) of the respondents were moderate to low in terms of their cosmopoliteness. None of the respondents was found high cosmopoliteness. This was due to the respondents' live in the isolated char land.

Table 4.2.8. Distribution of the respondents according to their cosmopoliteness.

Categories	Frequency	percent	Observed ranged	Mean	Standard deviation
Very low cosmopoliteness (up to 5)	43	43			
low cosmopoliteness (6-10)	53	53	0-13	5.76	2.60
medium cosmopoliteness (above 10)	4	4			

4.2.9 Innovativeness

Innovativeness scores of the respondents were computed on the basis of their extent use of new ideas. The maximum innovativeness score of the respondents was 15 and the minimum was 1 against the possible range of 0 to 50. However, the average was 6.19 and the standard deviation 4.06. Based on their innovativeness scores, the respondents were classified into two categories: "very low innovativeness" (up to 6), "low innovativeness" (7-15). The distribution of the respondents according to their innovativeness is shown in Table 4.2.9.

Data   contained in table 4.2.9 indicate that the highest proportion (63 percent) of the farmers had very low innovativeness as compared to 37 percent low innovativeness.

Table 4.2.9 Distribution of the respondents according to their innovativeness

Categories	Frequency	percent	Observed ranged	Mean	Standard deviation
Very low innovativeness (up to 6)	63	63	1-15	6.19	4.06
Low innovativeness (7-15)	37	37			

Data also revealed that majority (63 percent) of the respondents of the study area had very low level of innovativeness. It may also be concluded that all the respondents of the study area had the innovativeness. These two results would help the extension planners to chalk out future extension programme for transfer of new ideas to the potential farmers.

4.2.10 Attitude towards modern agricultural technology

Morgan *et al.* (1960) regarded 'attitude as literally mental postures, guides conduct for which each new experience is referred before a response is made'. Bernard (1965) defined ·attitude as a predisposition to act in a certain way. It is a state of readiness that influences a person to act in a given manner'. According to Drever (1968) 'an attitude is a more or less stable set or disposition of opinion, interest or purpose, evolving expectancy of certain kind of experience and readiness with appropriate kind of response'.

Attitude towards modern agricultural technology of the respondents was quantified by computing scores for their attitude towards modern agricultural technologies. The attitude towards technology scores ranged from 18 to 30 against the possible score 0 to 32 with an

average of 23.86 and the standard deviation of 2.92. Based on the observed attitude towards the technology scores, the respondents were classified into three categories: "low favourable attitude" (up to 20), "medium favourable attitude" (21-25) and "high favourable attitude" (26 and above). The distribution of the respondents according to their attitude towards modern agricultural technology is shown in Table 4.2.10.

Table 4.2.10 Distribution of the respondents according to their attitude towards modern agricultural technology

Categories	Frequency	Percent	Observed ranged	Mean	Standard deviation
Low favourable attitude (up to 20)	14	14			
Medium favourable attitude (21-25)	51	51	18-30	23.86	2.92
High favourable attitude (26 & above)	35	35			

Data presented in Table 4.2.10 show that the highest proportion (51 percent) of the farmers belonged to medium favourable attitude towards modern agricultural technologies as compared to 35 percent had high favourable attitude and 14 percent had low favourable attitude. This indicates that 86 percent of the respondents had medium or high attitude towards modern agricultural technology. Therefore, the extension personnel of GO and NGO have ample scope to disseminate agricultural technologies among the farmers of luter char.

4.2.11 Problems

Problem scores of the respondents were determined by using 12 statements. Computed scores of the respondents ranged from 1 to 28 against the possible range of 0 to 36 with the average being 20.37 and the standard deviation was 4.78. Based on problem scores, the farmers' problems were classified into three categories: "low burning problems" (up to

15). "medium burning problems" (16-25), and "high burning problems" (26 and above). The distribution of the respondents according to their attitude is shown in Table 4.2.11.

Data contain in Table 4.2.11 indicate that the majority (70 percent) of the farmers faced medium burning problems compared to 12 percent of them faced low burning problem and 18 percent of the farmers faced high burning problems. If a farmer can able to overcome these problems, it may contribute to the adoption of selected rice production practices.

Table 4.2.11 Distribution of the respondents according to their problems

Categories	Frequency	percent	Observed ranged	Mean	Standard deviation
Low burning problems (up to 15)	12	12			
Medium burning problems (16-25)	70	70	1-28	20.37	4.78
High burning problems (26 & above)	18	18			

4.2.12 Agricultural knowledge

Agricultural knowledge score of the farmers were computed on the basis of their knowledge about agricultural production with 20 questions. The agricultural knowledge scores of the farmers ranged from 4 to 30 against the possible range 0 to 50 with an average of 16.82 and standard deviation of 6.125. On the basis of agricultural knowledge scores, the farmers were classified into three categories: "low knowledge" (up to10), "medium knowledge" (11-20) and "high knowledge" (21 and above). The distribution of the farmers according to their agricultural knowledge is shown in Table 4.2.12.

Data contained in Table 4.2.12 indicate that the highest proportion (62 percent) of the farmers had medium knowledge compared to 14 percent having low knowledge and only 24

percent possesses high knowledge. It reveals that the majority of the farmers in the study area were under medium knowledge to low knowledge categories.

Table 4.2.12 Distribution of the respondents according to their agricultural knowledge

Categories	Frequency	Percent	Observed ranged	Mean	Standard deviation
Low knowledge (up to 10)	14	14			
Medium knowledge (11-20)	62	62	4-30	16.82	6.125
High knowledge (21 & above)	24	24			

4.3 Section III: Adoption of selected rice production practices

There are many technologies in Boro rice production. In this study only three important dimensions were taken into consideration for determining adoption of Boro rice production practices. The three dimensions were:

1. Area of selected Boro rice varieties.

2. Use of IPM practices for controlling pests & disease of Boro rice and

3. Recommended doses of fertilizers.

According to the measurement procedure of adoption of selected Boro rice production practices mentioned in methodology chapter. The adoption score of these three technologies ranged from 22-89 against the possible range of 0-100. The average adoption was 58.54 with a standard deviation of 18.02. Based on the adoption score, the farmers were classified into three categories: "low adopters" (up to 40), medium adopters" (41-60) and "high adopters" (61 and above).

Findings revealed that the highest proportion (53 percent) of the farmers fell under the high adopter's category, while 29 percent had medium adopters and only 18 percent had low adopters. Thus, an overwhelming majority of the farmers had medium to high adoption. For clarity of understanding, a bar diagram has been presented in Figure 4.3
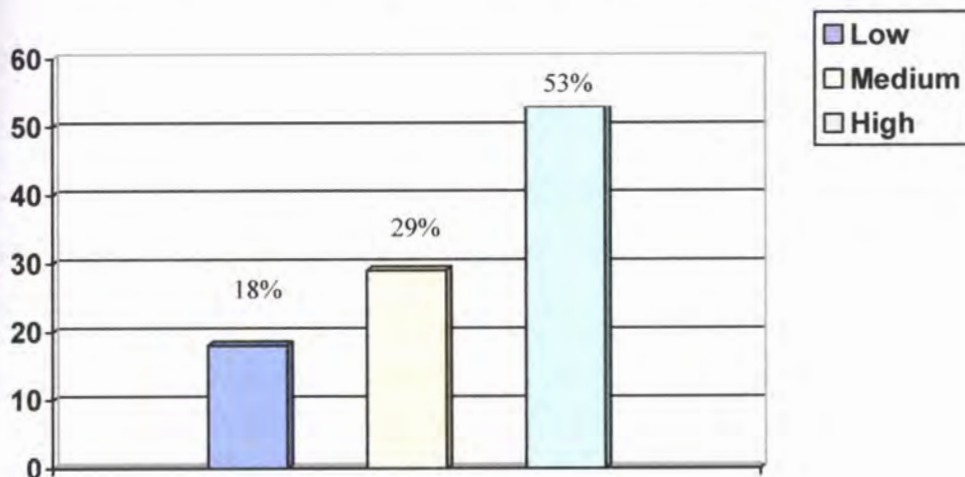
Figure 4.3 Bar-graph showing adopter categories of selected rice production practices

4.4 Section IV: Relationships between the selected characteristics of the farmers and their adoption of selected rice production practices

This section deals with the relationships with twelve selected characteristics of the farmers and their adoption of selected rice production practices. The selected characteristics constituted independent variables and the adoption of selected rice production practices by the farmers considered as dependent variable.

Pearson's product moment correlation co-efficient "r" has been used to test the hypothesis concerning the relationship between two variables 0.05 and 0.01 level of significance were used as the basis for acceptance or rejection of a hypothesis. Table 4.4.1 has been used for descriptive interpretation of the meaning of "r"

Table 4.4.1 the meaning of "r" values

"r"	Meaning
0.00 to 0.19	very low correlation
0.20 to 0.39	low correlation
0.40 to 0.69	moderate correlation
0.70 to 0.89	high correlation
0.90 to 1.00	very high correlation

Source: Cohen and Holliday, 1982: 92-93

The summary of the results of the correlations co-efficient relationships between the selected characteristics of the respondents and their adoption of selected rice production practices is shown in Table 4.4.2

Table 4.4.2 Co-efficient of correlation of the selected characteristics of the respondents/farmers and their adoption of selected rice production practices

Dependent variable	Independent variable	Computed value of "r"	Table value of "r" at 98 degree of freedom	
			0.05%	0.01%
Adoption of selected rice production practices	Age	0.202*		
	Level of education	0.009NS		
	Family size	-0.034NS		
	Farm size	0.220*		
	Annual income	0.204*		
	Organizational participation	-0.092NS	0.196	0.257
	Extension media contact	0.225*		
	Cosmopoliteness	-0.136NS		
	Innovativeness	0.197*		
	Attitude towards technology	0.202*		
	Problems	O.215*		
	Agricultural knowledge	0.227*		

NS Not significant, * significant at 0.05 level

4.4.1 Relationship between age of the farmers and their adoption of selected rice production practices

In order to determine the relationship between age of the farmers and their adoption of selected rice production practices, the following null hypothesis was tested:

"There is no relationship between age of the farmers and their adoption of selected rice production practices".

The co-efficient of correlation between the concerned variables was computed and found to be +0.202 as shown in table 4.4.2 which led to the following observation regarding the relationship between the two variables under consideration:

a) The trend of relationship between the two variables was positive direction and a low relationship was found between the two variables.

b) The computed value of "r" (r= +0.202) was found to be larger than the table value (r= ±0.196) with 98 degrees of freedom at 0.05 level probability.

c) The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.

d) The null hypothesis was rejected.

Based on the above findings, the researcher concluded that age of the farmers had a significant and positive relationship with their adoption of selected rice production practices. This meant the higher age of the farmers the higher was their adoption in respect of selected rice production practices. Ali *et al.* (1986), Singh and Rajendra (1990) and Hossain *et al.* (1992) observed the similar findings in their studies.

4.4.2 Relationship between level of education of the farmers and their adoption of selected rice production practices

The relationship between level of education of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between level of education of the farmers and their adoption of selected rice production practices".

Computed value of the co-efficient of correlation between the level of education of the farmers and their adoption of selected rice production practices was found to be +0.009 as shown in Table 4.4.2. The following observations were recorded regarding the relationships between the two variables on the basis of the co-efficient of correlation:

a) The relationship showed a positive trend and no relationship was found between the two variables.

b) The computed value of "r" (r= +0.009) was found to be smaller than table value (r = $\pm$ 0.196) with 98 degrees of freedom at 0.05 level of probability.

c) The co-efficient of correlation between the concerned variables was not significant at 0.05 level of probability.

d) The concerned null hypothesis could not be rejected.

The findings indicate that education of the farmers had no significant relationship with their adoption of selected rice production practices. Similar findings were also observed by Hossain (1981) and Bavalatti and sundaraswamy (1990).

The farmers who had higher education had higher adoption of selected rice production practices. Education enables individuals to gain knowledge and thus enables

individuals to gain knowledge and thus increase their power of understandings. Consequently, there out look is broaden and horizon of knowledge is expanded. Thus, adoption of selected rice production practices was higher of those farmers who had higher education. The level of education of the respondents of the study area is so lower thus; adoption of selected rice production practices of Luter-char was lower.

4.4.3 Relationship between family size of the farmers and their adoption of selected rice production practices

In order to the relationship between family size of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between family size of the farmers and their adoption of selected rice production practices".

The co-efficient of correlation between the concerned variables was found to be -0.034 as shown in Table 4.4.2. This led to the following observations regarding the relationship between the two variables under consideration:

a) The relationship showed a tendency in the negative direction between the concerned variables.

b) The computed value of "r" (r= -0.034) was larger than the table value (r= ± 0.257) with 98 degrees of freedom at 0.05 level of probability.

c) The co-efficient of correlation between the concerned variable was not significant at 0.05 level of probability.

d) The null hypothesis could not be rejected.

The finding demonstrates that the family size of the farmers had no significant and negative relationship with their adoption of selected rice production practices. This study indicates that adoption of selected rice production practices was not significantly increased with the increased family size. Pal (1995), Hossain (1999), Hussen (2001), Rahman (2001) and Aurangozeb (2002) observed also similar findings.

4.4.4 Relationship between farm size of the farmers and their adoption of selected rice production practices

In order to the relationship between farm size of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between farm size of the farmers and their adoption of selected rice production practices".

The calculated value of the correlation co-efficient between the two mentioned variables was found to be +0.220 as shown in Table 4.4.2. This led to the following observations regarding the relationship between the two variables under consideration:

a) A positive trend was observed between the two variables and the relationship between the concerned variables was low.

b) The computed value of "r" (r= +0.220) was larger than the table value (r= ± 0.196) with 98 degrees of freedom at o.05 level of probability.

c) The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.

d) The null hypothesis was rejected.

From the above observations, it might be concluded that there was significant positive relationship between farm size of the farmers and their adoption of selected rice production practices. The finding is quite rational, because adoption of selected rice production practices is relatively costly. Hence, large farmers get more scope than the small farmers as they can invest money for adoption of selected rice production practices. Many researchers (Hoque, 1993; Pal, 1995; Islam, M.S., 2002; Islam, M.A., 2003) observed the similar significant and positive relationship between these two variables.

4.4.5 Relationship between annual income of the farmers and their adoption of selected rice production practices

The relationship between age of the farmers and their adoption of selected rice production practices was measured by testing the following null hypothesis:

"There is no relationship between annual income of the farmers and their adoption of selected rice production practices".

Computed value of the correlation co-efficient between the annual income of the farmers and their adoption of selected rice production practices was found to be +0.205 as shown in Table 4.4.2. The following observations were recorded regarding the relationship between the two variables under consideration:

a) The relationship showed a tendency in the positive direction between the concerned variables and a low relationship was found between the two variables.

b) The computed value of "r" (r= +0.205) was larger than the table value (r= ± 0.196) with 98 degrees of freedom at o.05 level of probability.

c) The co-efficient of correlation between the concerned variable was significant at   0.05 level of probability.

d) The null hypothesis was rejected

On the basis of the observations, the researcher concluded that the annual income of the farmers had a positive significant relationship with their adoption of selected rice production practices. This means that the farmers having higher annual income were likely to have more adoption of selected rice production practices. Khan (1993), Aurangozeb (2002), Islam (2003) and many others found the similar results.

4.4.6 Relationship between organizational participation of the farmers and their adoption of selected rice production practices

In order to determine the relationship between organizational participation of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between organizational participation of the farmers and their adoption of selected rice production practices".

To find out the relationship, the correlation co-efficient was computed and found to be -0.092 as shown in Table 4.4.2 which led to the following observations between the concerned variables under consideration:

a) The relationship showed negative trends and no relationship was found between the two variables.

b) The computed value of "r" (r= -0.092) was higher than the table value (r= $\pm$ 0.196) with 98 degrees of freedom at o.05 level of probability.

c) The co-efficient of correlation between the two concerned variable was not significant at 0.05 level of probability.

d) The null hypothesis could not be rejected.

From the above observations, it might be concluded that there was no significant and negative relationship between organizational participation of the farmers and their adoption of selected rice production practices. The findings thus indicated that the farmers with some participation in organization had a negative tendency to adopt the selected rice production practices. This tendency, however, sharply decreased among the farmers with no-participation in organizations. Sarder (2002) observed the similar significant but positive relationship between these two variables

4.4.7 Relationship between extension media contact of the farmers and their adoption of selected rice production practices

In order to determine the relationship between extensions media contact of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between extension media contact of the farmers and their adoption of selected rice production practices".

The co-efficient of correlation between the concerned variables was found to be +0.225 as shown in Table 4.4.2. This led to the following observations regarding the relationship between the two variables under consideration:

a) The relationship showed a positive trend and a low relationship was found between the two variables

b) The computed value of "r" (r= +0.225) was found to be higher than table value (r = $\pm$ 0.196) with 98 degrees of freedom at 0.05 level of probability.

c) The co-efficient of correlation between the concerned variables was significant at 0.05 level of probability.

d) The concerned null hypothesis was rejected.

Thus the researcher concluded that extension media contact of the farmers had significant and positive relationship with their adoption of selected rice production practices. It means that higher extension media contact of the farmers was more likely to have more adoption of selected rice production practices. Rahman (1999), Hussen (2001), Rahman ((2001) and Aurangozeb (2002) observed the similar significant and positive relationship between these two variables.

4.4.8 Relationship between cosmopoliteness of the farmers and their adoption of selected rice production practices

The relationship between cosmopoliteness of the farmers and their adoption of selected rice production practices was examined by testing the following null hypothesis:

"There is no relationship between cosmopoliteness of the farmers and their adoption of selected rice production practices".

The co-efficient of correlation (r) between the concerned variables was found to be -0.136 as shown in Table 4.4.2. This led to the following observations regarding the relationship between the two variables under consideration:

a) The trend of relationship between the two variables was negative direction and a very low relationship was found between the two variables.

b) The computed value of "r" (r= -0.136) was found to be smaller than the table value (r= ±0.196) with 98 degrees of freedom at 0.05 level probability.

d) The co-efficient of correlation between the concerned variables was not significant at 0.05 level of probability.

d) The null hypothesis could not be rejected.

Based on the above findings, the researcher concluded that cosmopoliteness of the farmers had no significant and negative relationship with their adoption of selected rice production practices but Chowdhury (1997) observed the non significant but positive relationship between these two variables.

4.4.9 Relationship between innovativeness of the farmers and their adoption of selected rice production practices

The relationship between innovativeness of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between innovativeness of the farmers and their adoption of selected rice production practices".

Computed value of the correlation co-efficient between the innovativeness of the farmers and their adoption of selected rice production practices was found to be +0.197 as shown in Table 4.4.2. The following observations were recorded regarding the relationship between the two variables under consideration

a) The relationship showed a tendency in the positive direction between the concerned variables and a low relationship was found between the two variables.

b) The computed value of "r" (r= +0.197) was larger than the table value (r= ± 0.196) with 98 degrees of freedom at o.05 level of probability.

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c) The co-efficient of correlation between the concerned variables was significant at 0.05 level of probability.

d) The null hypothesis was rejected.

Considering the findings, the researcher concluded that innovativeness of the farmers had a significant and positive relationship with their adoption of selected rice production practices. Chowdhury (1997), Podder (1999) and Islam (2002) also found the similar significant positive relationship between these two variables.

4.4.10 Relationship between attitude towards modern agricultural technology of the farmers and their adoption of selected rice production practices

The relationship between attitude towards modern agricultural technology of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between attitude towards modern agricultural technology of the farmers and their adoption of selected rice production practices".

Computed value of the correlation co-efficient between attitude towards modern agricultural technology of the farmers and their adoption of selected rice production practices was found to be +0.202 as shown in Table 4.4.2. The following observations were recorded regarding the relationship between the two variables under consideration:

a) The relationship showed a tendency in the positive direction between the concerned variables and a low relationship was found between the two variables.

b) The computed value of "r" (r= +0.202) was larger than the table value (r= ± 0.196) with 98 degrees of freedom at o.05 level of probability.

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c) The co-efficient of correlation between the concerned variables was significant at 0.05 level of probability.

d) The concerned null hypothesis was rejected.

The researcher thus concluded that the attitude towards modern agricultural technology of the farmers had significant and positive relationship with their adoption of selected rice production practices.

Innovative farmers are more dynamic, conscious and have more eagerness towards innovation. Adoption of selected rice production practices among the innovative farmers is probably due to the manifestation of their aforesaid behavioural aspects. Mostafa (1999) and Islam (2002) also found the similar significant and positive relationship between these two variables.

4.4.11 Relationship between problems of the farmers and their adoption of selected rice production practices

The relationship between problems of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between problems of the farmers and their adoption of selected rice production practices".

The co-efficient of correlation between the concerned variables was computed and found to be +0.215 as shown in table 4.4.2 which led to the following observations regarding the relationship between the two variables under consideration:

a) The trend of relationship between the two variables was positive direction and a low relationship was found between the two variables.

b) The computed value of "r" (r= +0.215) was found to be larger than the table value (r= ±0.196) with 98 degrees of freedom at 0.05 level probability.

c) The co-efficient of correlation between the concerned variables was significant at 0.05 level of probability.

d) The null hypothesis was rejected.

Based on the above findings, the researcher concluded that problems of the farmers had a significant and positive relationship with their adoption of selected rice production practices. This meant that higher the problems faced by the farmers the higher was their adoption of selected rice production practices. This might be due to that the problematic farmers facing more problems were easier to adoption of the selected rice production technologies to solve their problem.

4.4.12 Relationship between agricultural knowledge of the farmers and their adoption of selected rice production practices

In order to determine the relationship between agricultural knowledge of the farmers and their adoption of selected rice production practices the following null hypothesis was tested:

"There is no relationship between agricultural knowledge of the farmers and their adoption of selected rice production practices".

The calculated value of the correlation co-efficient between the two concerned variables was found to be +0.227 as shown in Table 4.4.2. This led to the following observations regarding the relationship between the two variables under consideration:

b) The computed value of "r" (r= +0.227) was larger than the table value (r= ± 0.196) with 98 degrees of freedom at o.05 level of probability.

c) The co-efficient of correlation between the concerned variables was significant at 0.05 level of probability.

d) The concerned null hypothesis was rejected.

From the above observations, it might be concluded that there was significant positive relationship between agricultural knowledge of the farmers and their adoption of selected rice production practices. The finding is quite rational, because adoption of selected rice production practices is relatively intellectual. Hence, an intelligent farmer can accept technology earlier than the non-intelligent farmers. Many researchers (Ali, 1993; Bashar, 1993; Islam, 2002) observed the similar significant and positive relationship between these two variables.

Chapter V

SUMMARY

The summary of the major findings are presented in the following four sub-section

5.1.1 Section I: selected characteristics of the farmers

Age: Age of the farmers ranged from 17 to 80 years. The average being 50.46 years with a standard deviation of 14.24. The highest proportions (57 percent) of the farmers were middle aged, while 26 percent were old aged and 17 percent were young.

Level of education: Level of education of the farmers ranged from o to 11. The average score being 1.80 and the standard deviation was 3.07. The highest proportion (52 percent) of the farmers had no education compared to 22 percent "can sign only", 11 percent having "primary education", 14 percent having "secondary education" and only 1 percent having "above secondary education".

Family size: The family member of the farmers ranged from 2 to 18 with the average of 6.66 and the standard deviation was 2.67. The highest proportion (62 percent) of the farmers had medium family size compared to 23 percent large and 15 percent small family size categories.

Farm size: Farm size of the farmers ranged from 0.13 to 2.83 hectares with an average of 0.87 and the standard deviation was 0.56. The highest proportion (38 percent) of the farmers had medium sized farm compared to 37 percent having small farm and 25 percent having large farm.

Annual income: Annual income scores of the farmers ranged from 12.00 thousand to 724.36 thousand with an average of 109.6475 thousand and the standard deviation was 87.81. The highest proportion (48 percent) of the farmers had high income compared to 40 percent under medium income and 12 percent under low income categories.

Organizational participation: Organizational participation scores of the farmers ranged from 0 to 5 against the possible range of 0 to 18 with an average of .49 and the standard deviation was 1.01. The highest proportion (74 percent) of the farmers had no participation in organization compared to 25 percent had very low participation, and only 1 percent had low organizational participation categories.

Extension media contact: The Extension media contact scores of the farmers ranged from 0 to 17 against the possible range of 0 to 72. The average extension media contact score was found to be 7.62 with a standard deviation of 3.25. The highest proportion (70 percent) of the respondents had very low extension contact compared to 28 percent having low and only 2 percent having no extension media contact.

Cosmopoliteness: Cosmopoliteness scores of the farmers ranged from 0 to 13, against the possible range was found to be 0 to 32. The average cosmopoliteness scores were found to be 5.76 with a standard deviation of 2.60. The highest proportion (53 percent) of the farmers had low cosmopoliteness compared to 43 percent having very low cosmopoliteness, and only 4 percent having medium cosmopoliteness.

Innovativeness: The innovativeness scores of the farmers ranged from 1 to 15, against the possible range of 0 to 50 with an average of 6.19 and the standard deviation of 4.06.The

highest proportion (63 percent) of the farmers had very low innovativeness as compared to 37 percent low innovativeness.

Attitude towards modern agricultural technology: The attitude towards modern agricultural technology scores of the farmers ranged from 18 to 30 against the possible scores 0 to 32. The average attitude towards modern agricultural technology score was found to be 23.86 with a standard deviation of 2.92. The highest proportion (51 percent) of the respondents had performed medium favourable attitude towards modern agricultural technology compared to 35 percent having high favourable attitude and 14 percent having low favourable attitude towards modern agricultural technology.

Problems: The problems scores of the farmers ranged from 1 to 28, against the possible range were found to be 0 to 36. The average problems scores were found to be 20.37 with a standard deviation of 4.78. The highest proportion (70 percent) of the farmers had faced medium burning problems compared to 18 percent high and 12 percent having faced low burning problems.

Agricultural knowledge: Agricultural knowledge scores of the farmers ranged from 4 to 30, against the possible range of 0 to 50 with an average of 16.82 and the standard deviation of 6.125. The highest proportion (62 percent) of the farmers had medium Agricultural knowledge as compared to 24 percent high Agricultural knowledge and only 14 percent with low Agricultural knowledge.

5.1.2 Section II: Adoption of selected rice production practices

Adoption of selected rice production practices was the main focus of the study. It was quantified by computing scores. These scores of the respondent could range from 22 to 89, against the possible range of 0 to 100 with an average of 58.54 and the standard deviation of 18.02. The highest proportions (53 percent) of the farmers under the high adopters category, while 29 percent had medium adopters and only 18 percent had low adopters of selected rice production practices

5.1.3 Section III: Relationship between the selected characteristics of the farmers with their adoption of selected rice production practices.

To explore the relationship of the twelve selected characteristics of the farmers with their adoption of selected rice production practices. For this, twelve null hypotheses were formulated. Fore test hypothesis, co-efficient of correlation (r) was used. One (0.01) and five (0.05) percent level of significance was the basis for rejecting a null hypothesis. The results of hypothesis testing are presented below in brief:

Correlation analysis indicates that level of education, family size, organizational participation, cosmopoliteness of the farmers had no significant relationship with their adoption of selected rice production practices. Hence, the null hypothesis concerning these variables was accepted by the researcher. Age, farm size, annual income, extension media contact, innovativeness, attitude towards modern agricultural technology, problens and agricultural knowledge were found to have positively significant relationships with the adoption of selected rice production practices. Hence, the concerned null hypothesis was rejected.

Chapter VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusions

Conclusion is the final decision or judgment, which is established through argument at the end or termination of a research work. It includes inferences and logical interpretation of the findings of the study. Conclusion should be so constructive that its words and arguments must drew the attention of the concerned individuals/organizations. The objectives findings and relevant facts of the study prompted the researcher to draw following conclusions.

1) The adoption of selected rice production practices of the farmers was satisfactory, as nearly 82 percent of the farmers had medium to high adoption. However, to meet the ever-growing demand of food, economic facts, and environmental problems, there is a need to further enhance the rate and extent of adoption of selected rice production practices among the farmers. Particularly, both the Government Organization (GO) and Non-Government Organization (NGO) workers should provide appropriate technical and field management information to all farmers through continued extension education and support services.

2) The study indicates that age of the majority farmers (83 percent) were middle to old aged and its relationship with their adoption of selected rice production practices was positively significant. It may, therefore, be concluded that extension teaching should be given to all age categories of the farmers specially on the middle and old aged

farmers by the extension workers in order to encourage adoption of selected rice production practices. However, considering the facts it would be wise to work with young aged farmers as they more receptive than the older.

3) Level of education of the farmers of Luter-char showed no significant relationship with the adoption of selected rice production practices. It was observed that more than half (52 percent) of the respondents was illiterate including 22% can sign only. People of Luter-char being the illiterate society, never the less they were not left behind in adoption of rice production practices. It was amazing and miraculous. Conclusion could be drown that this char-land could be improved in all aspects of socio-economic of life if government takes more educational project to make it a literate and elite society.

4) Findings of the study showed that family size of the farmers had no significant and negative relationship with their adoption of selected rice production practices. The study indicates that family size of the majority farmers (85 percent) were medium to large. It may, therefore, be concluded that for the adoption of selected rice production practices by the farmers, extension workers should concrete their works with the farmers of any particular family size whether it is large, medium or small farmers.

5) Farm size of the farmers had a significant and a positive relationship with their adoption of selected rice production practices. It means that larger the farm size more the adoption, but most of the farmers are small and marginal. So, extension agent should take special care of small and marginal farmers. Large farmers can take risk than small and marginal farmers. To establish a rivable economy in Bangladesh small

and marginal farmers should adopt innovation at the same speed of large farmers. Conclusion can be drown that large, medium, small – all farm size categories should be given equal information, educational and motivational service.

6) Findings of the study showed that annual income of the farmers had a significant and positive relationship with their adoption of selected rice production practices. That is, the more annual income the more extent of adoption. New ideas, no doubt, give better result but some financial investment is necessary to adopt those practices. Moreover, adopting new ideas carries a risk which may discourage a low income farmer to adopt the same. These facts suggest that the farmers who are financially solvent, they have courage to take risk to adopt any new practices. It was the fact that majority (88 percent) of the farmers had medium to high annual income. Therefore, it may be concluded that high annual income encourage the farmers to adoption of selected rice production practices.

7) Organizational participation of the farmers had no significant and negative relationship with their adoption of selected rice production practices. Participation of the farmers in organizations is helpful to increase their adoption of selected rice production practices because it brings the farmers in contact with new ideas, new people, and new things. Luter-char is a char-land isolated from the main land. There was little scope for organizational participation in the study area. However, low organizational participation and low literacy rate could not hamper the adoption of selected rice production practices. Conclusion could be drawn that if the people of Luter-char be literate and participate in organizational activities. The people will likely to develop themselves fester than main land people.

8) The findings revealed that extension media contact of the farmers had a significant and positive relationship with their adoption of selected rice production practices. Extension media contact increases the outlook of the farmers which lead them to adopt selected rice production practices. The extension media contact score was 0-17 against the possible score 0-72. The highest possible score is more then 4 time higher than obtained score. It means that there was no planned extension media contact in the area. In the char-land like Luter-char extension personnel has the responsibility to make extension contact with new production practices. However, without meaningful extension contact the adoption score of Luter-char farmers was satisfactory. Conclusion can be drawn that G.O. and NGO extension personnel should visit char-lands and create opportunity to contact with other extension media.

9) Findings of the study showed that cosmopoliiteness of the farmers had no significant and negative relationship with their adoption of selected rice production practices. Through cosmopoliteness, an individual farmer becomes aware of the recent information on the various aspects of modern cultivation. But they can't motivate to adopt selected rice production practices due to influence by others. The findings of the study, therefore, lead to the conclusion that steps to be taken to expose the farmers with different mass media to become conscious about the adoption of selected rice production practices. They should also be encouraged to visit agricultural fairs, participate result demonstration and method demonstration meetings,

10) Innovativeness of the farmers had a significant and positive relationship with their adoption of selected rice production practices. It may be concluded that the farmers of the study area had the positive attitude towards innovation. This situation is quite favourable for the implementation agricultural development programmes.

11) Farmer's attitude towards modern agricultural technology had a significant and positive relationship with their adoption of selected rice production practices. It is important to know about the nature of human behaviour which is very complex. The personality with its high complex components manifests itself in different kinds of behaviour. Again there are a number of factors, such as, superstitions, beliefs, traditions/customs which often acts as resistant forces. The nature of human behaviour is determined to a grater extent by those factors. To meet these resistances effectively, the extension personal should continuously try to bring about desirable change in the attitude of people and establish a healthy relationship between them by all possible means. It is, therefore, concluded that extension workers should deal adequately with the farm people through various teaching methods and rightly consider those characteristics of the farmers which have some bearing on these activities.

12) Agricultural knowledge of the farmers had a significant and positive relationship with their adoption of selected rice production practices. Through agricultural knowledge an individual farmers became aware of the recent information on the various aspect of selected rice production practices. Consequently, they became motivated to adoption of selected rice production practices. The above facts lead to the conclusion that necessary arrangements should be made increase the agricultural knowledge of farmers which would ultimately increase the adoption of selected rice production practices.

5.3 Recommendations

Recommendations have been divided into two sub-sections, viz.

      I.   Recommendations for policy implications and

      II.   Recommendations for further study.

5.3.1 Recommendations for policy implications

Based on findings and conclusions of the study, the followings recommendations are presented below:

1. It is recommended that extension organizations and other support services should be aware of to accelerate farmer's knowledge about different agricultural innovations and adoption of selected rice production practices. So concerned extension organizations and other support services must arrange training and discussion some meetings so that farmers can change their attitude to adoption of selected rice production practices.

2. An increased rate and extent of adoption of selected rice production practices are vitally important for increasing the yield of rice production. It is revealed from the adoption score that a considerable proportion (82 percent) of the farmers had medium to high adoption of the selected rice production practices. This is very much encouraging. This rate and extent of adoption should be maintained at all along. It is, therefore, recommended that an effective step should be taken by the Department of Agricultural Extension (DAE) and Non-Government Organizations (NGOs) for strengthening the farmers' knowledge, attitude and skill in favour of adoption of selected rice production practices to a higher degree.

3. Age has the significant relationship with the adoption of selected rice production practices in the study area. Therefore, it is recommended that the extension workers should work with the farmers of all age groups to promote adoption of selected rice production practices. However, they will have to work more comparatively with middle aged farmers.

4. Farm size and family size are the two important influential aspects of adoption of innovation. Farm size and family size whether they are small or large should be equally emphasized during diffusion of innovation. So it is recommended that the extension workers of G.O and NGO should work with the all categories of farmers. It is also one of the principles of NAEP.

5. Farmers of Bangladesh simultaneously play roles of crop producer, from manager, consumer, buyer and seller. Due to power crisis farmers only produce their crop. But when farmers go to market for selling surplus products they do not get reasonable price. Again when they need seeds the businessman like more price. So, it is recommended that extension service should provide farmers adequate farm management practices including storing and marketing. Producing more crops will not help farmers to be self sufficient and self reliant with regard to socioeconomic development.

6. It was observed that about majority (70 percent) of the farmers of the study sample had very low extension media contact. The Department of Agricultural Extension and other community development related organizations should take steps to take

cognizance of the facts and to increase contact of the farmers with extension workers and other sources of extension information.

7. Cosmopoliteness of the farmers had no significant and negative relationship with their adoption of selected rice production practices. However, majority (96 percent) of the farmers were very low to low in cosmopoliteness. Therefore, it is recommended that the extension workers should mobilize the farmers for increasing their cosmopolite behaviour in order to facilitate their adoption of selected rice production practices by arranging field tour and krishimela, chashi-rally, field day etc.

8. Innovative farmers possess the best quality, which impel them to use new ideas even in the face of various problems and difficulties. The farmers with high innovativeness use modern farm technologies and provide opportunity to others to see the advantages and disadvantages of those methods. It is therefore, recommended that extension workers should carefully identify the farmers with high innovativeness for using them as local leaders and demonstrators of new ideas.

9. It was observed that higher (86 percent) number of the farmers had higher favourable attitude score towards agricultural technologies. It may be recommended that massive demonstration programmes, training programmes, field trips etc. should be executed to bringing about desirable changes in the farmers' attitude.

10. Farmers face considerable burning problems in connection with adoption of selected rice production practices. It is therefore, recommended that concerned authorities should give attention to the solution of the problems as soon as possible.

11. Farmers having medium to high knowledge about adoption of selected rice production practices. It should be selected on priority basis for any motivational training by DAE and other relevant GOs and NGOs for achieving sustainable rice production.

5.3. II Recommendations for further study

A small piece of study as has been conducted can not provide all information for the proper understanding of the farmer towards the selected rice production practices. Therefore, the following recommendations were made for further study.

1. The present study was conducted in the one village of Luter-char union under Daudkandi Upazila. It is recommended that similar studies should be conducted in other char-areas of Bangladesh.

2. The study was based on the farmers' adoption of selected rice production practices. Further studies may be conducted in respect of adoption other crop production practices.

3. The relationships of eleven important characteristics of the farmers with their adoption of selected rice production practices have been investigated in this study viz. age, level of education, family size, farm size, annual income, organizational participation, extension media contact, cosmopoliteness, innovativeness, attitude towards modern agricultural technologies, problems and agricultural knowledge. But besides these eleven characteristics of the farmers, there might be other factors such as planting method, fertilizer application and women participation which influence the adoption of selected rice production practices. Therefore, further research should be conducted to explore the relationships of such other characteristics of the farmers with their adoption of selected rice production practices.

4. The present study investigated the relationships of twelve selected characteristics of the farmers with the composite adoption behaviour of the farmers i.e. adoption behaviour of three selected technologies of Boro rice such as BR3, BR8, BRRI Dhan28 and BRRI Dhan29 collectively. Further studies should be conducted to explore the relationship of different characteristics with the adoption of each of the four technologies as well as other technologies.

5. The present study has been carried out among the male farmers only. So, a similar study may be conducted with the farm women to examine their views and opinions regarding the adoption of selected rice production technologies.

6. Adoption is the measurement of implementation by the farmers as well as vital indicator of agricultural development. It is a continuous process due to change of social system, change of technologies, change of human behaviour, change of cropping patterns, change of adoption patterns etc. So, it is suggested that there should be continuous adoption research in various aspects for agricultural development.

Chapter VII

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English Version of the Interview Schedule

Department of Agricultural Extension & Information System

Sher-e-bangla Agricultural University

Dhaka

An Interview schedule on

ADOPTION OF SELECTED RICE PRODUCTION PRACTICES BY THE FARMERS OF CHAR-LAND OF GOMOTI RIVER

Name of the respondent: ....

SL. No: ....

Fathers name: ....

Date: ....

Village: ....

Union: ....

Upazilla: ....

District: ....

Please answer the following questions. Your information must be keep secret and only used for the research purpose.

1. Age

What is your age? ....years

2. Level of education

Describe of your educational qualification. (Please tick mark for the correct answer/ fill in the gaps)

a) Can not read and write (...........................)

b) Can sign only (....................................)

c) I read up to class ....

d) I can not read in school but the value of my education is ....class equivalent.

3. Family size

How many members are there in your family?

...............................persons

4. Farm size

Please mention your land property according to use.

SL. No	Types of land	Land area	
		Local unit	Hectare
1.	Homestead		
2.	Own land under own cultivation		
3.	Own land given to others' on borga		
4.	Own land given to others' on lease		
5.	Land taken from others' on borga		
6.	Land taken from others' on lease		
7.	Own pond		
8.	Own garden		
9.	Other fallow land (if any)		
	Total		

5. Annual income

Please particulars about your annual income from the following sources

A) Income from agricultural crops

SL. NO	Name of crops	Production (Kg or Mound)	Value Per Kg or Mound (TK)	Total Value (TK)
1.	Aus			
2.	Aman			
3.	Boro			
4.	Wheat			
5.	Maize			
6.	Jute			
7.	Pulse crops			
8.	Oil crops			
9.	Spices			
10.	Vegetables			
11.	Fruits			
12.	Others			
	Sub-total			

B) Income from domestic animals and fisheries

SL. NO.	Sources of income	Total production (Kg or Mound)	Value per unit element (TK)	Total Value (TK)
1.	Livestock			
2.	Poultry			
3.	Fisheries			
	Sub-total			

C) Income from Non-agricultural sources

SL. NO.	Sources of income	Response		Total income(TK)
		Yes	No	
1.	Service			
2.	Buisness			
3.	Day labour			
4.	Other family members			
5.	Others			
	Sub-total			

Total income = (A+ B+ C) = ……………………………………..Taka

6. Organization Participation

Please state your frequency of participation of the following organization. Please tick mark in right space or allude the year.

SL. NO.	Name of organization	Frequency of participation			
		No participation	General member	Active member	Officer
1.	Farmers co-operative				
2.	NGO co-operative				
3.	Mosque committee				
4.	School committee				
5.	Madrasa committee				
6.	Others (if any)				

7. Extension media contact

Please mention the frequency of communication of the following persons and agriculture related media.

SL. No.	Communication media	Extent of communication media				
		Regularly	Often	Occasionally	Rarely	Not at all.
Personal media contact						
1.	Block supervisors	6-7 times/ 6 months ()	5-6 times/6 months ( )	4-5 times/6 months ( )	1-3 times/6 months ( )	0 times/6 months ()
2.	Agril. Extension Officer	5-6 times/ year ( )	4-5 times/ year ( )	3-4 times/ year ( )	1-2 times/ year ( )	0 ( )
3.	Upazilla Agricultural officer	3 or more times/ year ( )	3 times/ year ( )	2 times/ year ( )	1 times/ year ( )	0 ( )
4.	Local leader	6-7 times/ month ( )	5-6 times/ month ( )	3-4 times/ month ( )	1-2 times/ month ( )	0 ( )
5.	NGO workers	5-6 times/ month ( )	4-5 times/ month ( )	3-4 times/ month ( )	1-2 times/ month ( )	0 ( )
6.	Seed/Fertilizer dealer	1 time/ month ( )	1 times/ month ( )	1 times/ 3 month ( )	1 times/6 month ( )	0 ( )
7.	Upazilla Livestock officer	6-7 times/ year ( )	5-6 times/ year ( )	3-4 times/ year ( )	1-2 times/ year ( )	0 ( )
Group Media contact						
8.	Group discussion	7-8 times/ year ( )	6-7 times/ year ( )	4-5 times/ year ( )	2-3 times/ year ( )	0 ( )
9.	Field day	3 times/ year ( )	2-3 times/ year ( )	2 times/ year ( )	1 times/ year ( )	0 ( )
10.	Result demonstration	1 times/ year ( )	1 times/ year ( )	1 times/2 year ( )	1 times/3 year ( )	0 ( )
11.	Participation in agrl. Training course	4-5 times/ life ( )	3 times/ year ( )	2-3 times/ life ( )	1 times/ life ( )	0 ( )
Mass Media Contact						
12.	Daily Paper	5-7 times/ week ( )	4-5 times/ week ( )	3-4 times/ week ( )	1-2 times/ week ( )	0 ( )

13.	Radio	5-7 times/ week ( )	4-5 times/ week ( )	3-4 times/ week ( )	1-2 times/ week ( )	0 ( )
14.	Television	5-7 times/ month ( )	4-5 times/ month ( )	3-4 times/ month ( )	1-2 times/ month ( )	0 ( )
15.	Poster	5-7 times/ year ( )	4-5 times/ year ( )	3-4 times/ year ( )	1-2 times/ year ( )	0 ( )
16.	Leaflet	5-7 times/ year ( )	4-5 times/ year ( )	3-4 times/ year ( )	1-2 times/ year ( )	0 ( )
17.	Agril. Related Book/Magazine	6-12times/ year ( )	4-5 times/ year ( )	3-4 times/ year ( )	1-2 times/ year ( )	0 ( )
18.	'Krishimela'	1 times/ year ( )	1 times/ year ( )	1 times/ 2 year ( )	1 times/3 year ( )	0 ( )

8. Cosmopolitenes

Please mention the frequency of communication of the following places. (Please tick mark in right space)

SL. No.	Name of visit	Frequency of visit				
		Regularly	Often	occasionally	Rarely	Not at all
1.	Others village	10-12 times/ month ( )	9-10 times/ month ( )	5-9 times/ month ( )	1-4 times/ month ( )	0 ( )
2.	Others union	4-5 times/ month ( )	3-4 times/ month ( )	2-3 times/ month ( )	1 times/ month ( )	0 ( )
3.	Upazilla sadar	10-12 times/ year ( )	9-10 times/ year ( )	5-9 times/ year ( )	1-4 times/ year ( )	0 ( )
4.	Others upazilla sadar	8-10 times/ year ( )	7-8 times/ year ( )	4-7 times/ year ( )	1-2 times/ year ( )	0 ( )
5.	Own district	6-8 times/ year ( )	5-6 times/ year ( )	3-5 times/ year ( )	1-2 times/ year ( )	0 ( )
6.	Others district	3-4 times/ year ( )	2-3 times/ year ( )	2 times/ year ( )	1 times/ year ( )	0 ( )
7.	Regional agril. Research institute	3 times/ year ( )	2-3 times/ year ( )	2 times/ year ( )	1 times/ year ( )	0 ( )
8.	Capital city	4 times/ life ( )	3 times/life ( )	2 times/life ( )	1 times/life ( )	0 ( )

9. Innovativiness:

Please give your information about the use of following technologies

SL No	Name of technology	Don't use	Nature of use				
			Within one year after hearing	Within one year after hearing	Within one year after hearing	Within one year after hearing	Within one year after hearing
1.	Cultivation of modern variety of crops						
2.	Use of green manure						
3.	Use of compost						
4.	Use of bio-fertilizer						
5.	Use of granular urea						
6.	Use of mixed fertilizer						
7.	Use of power tiller						
8.	Cultivation of vegetables in homestead area						
9.	Use of weedicide						
10.	Plantation of tree in the fellow area or beside the road						

10. Attitude towards Modern Agricultural Technology

Please indicate your agreement with the following statement

SL. NO.	Statement	Extent of agreement/disagreement				
		Strongly agreed	Agreed	Undecided	Disagreed	Strongly disagreed
1(+)	Chemical fertilizers are necessary for increase in agricultural production					
2(-)	It is not necessary to use modern varieties (MVs) to get more rice production					
3(+)	To increase rice production, it is not necessary to transplanting seedling in with proper spacing					
4(-)	Organic manure[Compost, Farm Yard Manure(FYM), Green manure] improve soil quality than chemical fertilizer					

5(+)	Yield of crops decreases if we transplant modern variety (MV) seedling lately					
6(-)	Disease and pest do not cause any harm for crop production					
7(-)	Country plough is more effective than mould board plough					
8(+)	It is necessary to aggregate plant and animal to balance environment					

11. Problems

Please mention the extent of problems that you faced during use and application of modern agricultural technologies

SL. No.	Problems	Extent of Problem			
		High	Medium	Low	Not at all
1.	Lack of agricultural machineries and tools for improved cultivation				
2.	Inadequate knowledge about modern agricultural technologies				
3.	Inadequate irrigation in dry season				
4.	Natural calamities				
5.	High cost involvement for adoption of modern agricultural technologies				
6.	Lack of Government loan for improved cultivation by using modern agricultural technologies				
7.	Inadequate help from Block Supervisors				
8.	Lack of cash money				
9.	Scarcity of modern variety of seed, fertilizer and pesticides when they are needed				
10.	Unable to read leaflets and booklets about modern agricultural technologies				
11.	Others (If any)				

12. Agricultural Knowledge

Please answer the following question

SL No.	Questions	Score Weighted	Score Obtained
1.	Name three high yielding varieties (HYV) of rice suitable for Transplanted Aman (T. Aman) rice.	3	
2.	Name three HYV rice suitable for Aus rice.	3	
3.	Name two important diseases of Tomato.	2	
4.	Mention two major functions of urea on rice cultivation.	2	
5.	Mention two major functions of TSP on rice cultivation.	4	
6.	State two major Functions of MP on rice cultivation.	2	
7.	Name four common fertilizers available at your local market.	4	
8.	What do you mean by balanced fertilizer?	2	
9.	What do you mean by organic fertilizer?	2	
10.	Mention the component of compost.	2	
11.	Mention the name of three crops cultivated for green manure.	3	
12.	Mention recommended fertilizer dose of urea, TSP and MP in Aman cultivation.	3	
13.	Mention three harmful insects of your area.	3	
14.	Mention two important disease of rice.	2	
15.	Name three insecticides available in your local market.	3	
16.	State two methods of controlling rat in rice field.	2	
17.	Mention two important diseases of cucumber.	2	
18.	Name two modern varieties of potato.	2	
19.	Name two modern varieties of tomato.	2	
20.	Mention two important diseases of wheat.	2	
	Total	50	

13. Adoption of selected rice production practices

Please give the following information about the selected rice production practices.

SL. No.	Name of practices	2002-2003		2003-2004		2004-2005	
		Net useable land(ha)	Net used land (ha)	Net useable land(ha)	Net used land(ha)	Net useable land(ha)	Net used land(ha)
1.	Cultivation of Boro rice BR3(Biplob) BRRIdhan28 BR8(Asha) BRRIdhan29						
2.	Integrated pest management (IPM) used by controlling diseases & insect control.						
3.	Application of recommended dose of fertilizer Urea – 180kg/h TSP – 130kg/h MP – 70kg/h Cowdung 5-7 ton/h						

Thanks for your participation.

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Signature of interviewer

Dated.....................................