ADOPTION OF BRRI DHAN 47 BY THE COASTAL FARMERS OF NOAKHALI DISTRICT

By

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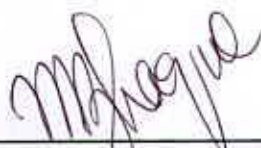**REGISTRATION NO.06-2093**

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CERTIFICATE

This is to certify that thesis entitled, "**ADOPTION OF BRRI DHAN 47 BY THE COASTAL FARMERS OF NOAKHALI DISTRICT**" submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfilment 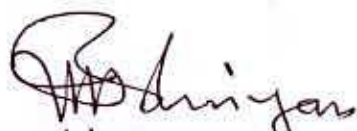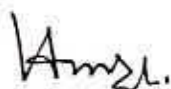of the requirements for the degree of **MASTER OF SCIENCE in AGRICULTURAL EXTENSION AND INFORMATION SYSTEM**, embodies the result of a piece of *bona fide* research work carried out by **SANJIDA KHANDKER**, Registration No. 06-2093 under my supervision and guidance. No part of the thesis has been submitted 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: June 2013

Place: Dhaka, Bangladesh

(Prof. M. Zahidul Haque)

Supervisor

DEDICATED

TO

MY BELOVED PARENTS

ACKNOWLEDGEMENT

June 2013   **The Author**

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ADOPTION OF BRRI DHAN 47 BY THE COASTAL FARMERS OF NOAKHALI DISTRICT

ABSTRACT

The objectives of this study were to determine the extent of adoption of BRRI dhan 47 in Noakhali district. Data were collected from randomly selected 100 farmers via pre-tested interview schedule during September 20 to October 10, 2012. After data collection, age, education, family size farm size, annual family income, organizational participation, extension media contact and knowledge on rice cultivation were coded for processing and analysis. Percentage, mean, standard deviation were calculated. Coefficients of correlation (r) were computed to find out the relationship between adoptions of BRRI dhan 47 with the selected socio-economic characteristics of farmers. Majority of the respondents were middle aged (48%), having primary level education (46%), medium family size (60%), small farm size (51%), medium annual income (66%), very low organizational participation (65%), low innovativeness (72%), medium extension contact (64%), and medium knowledge on rice cultivation (70%). Majority (53%) of the respondents had low adoption of BRRI dhan 47 whereas 42 % medium and only 5% under high adoption category. Farmers' education, farm size, annual income, innovativeness, extension contact, and knowledge on rice cultivation showed significant and positive relationship with adoption of BRRI dhan 47. Shattering problem, cost on irrigation, natural calamities were the major problems faced by the farmers in cultivating BRRI dhan 47. Proper extensions activities are needed to disseminate BRRI dhan 47 to bring the uncultivated areas under rigorous cultivation for ensure a better livelihood on the coastal farmers.

CHATER 1
INTRODUCTION

1.1.   General Background

Rice (*Oryza sativa* L.) is the most important cereal crops of the world and more than half of world population used as a staple food. There are more than 110 countries in the world occupying rice almost 160 million hectares, 700 million tons of rice is being produced every year (IRRI, 2010). The total area of cultivation of rice in Bangladesh almost11.35 million hectares and its average production of rice 31.98 million metric tons. Now a day's increasing population is one of the key factors in Bangladesh. To provide residence of huge population, cultivable area decrease gradually. But average rice yield in Bangladesh is only 4.34 t ha^{-1} (BRRI, 2011). To fulfill the huge demand of food for this growing population should be the world's annual rice production increase about 760 million tons within 2020 (Kundu and Ladha, 1995). However, rice yield should be increased by using high yielding varieties (HYV) like saline tolerant verities and its proper management technique.

The costal saline areas spread in 64 upzilas of 13 districts of Bangladesh (Chowdhury *et al.*2012). A huge part of coastal area is covered by the Sundarbans, remaining land used in agriculture. The Coastal area like, Shatkhira, Khulna, Bagerhat, Barguna, Patuakhali, Pirujpur, Bhola, Noakhali, Chittagong, Feni, in Bangladesh affected by varying degree of salinity. Salinity is one of the most serious environmental problems limiting the productivity of agricultural crops. Salinity affects more than 25% of worth land (Levigneron et al., 1995; Chahine et al. 2013), and desertification and salinization are rapidly increasing on a global scale declining average yields for most major crop plants by more than 50% (Bray et al., 2000)

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BRRI Dhan 47, new saline tolerant paddy has been introduced in the coastal region in Bangladesh during 2006-2007. Chowdhury et al. (2012) reported that the BRRI dhan 47 is more suitable to salinity (12-14 dsm^{-1}) in comparison with the conventional HYV (4dsm^{-1}). However saline tolerant variety is allowed to secure poor farmers to sustain their income and also save their lands, which seems as low profitable land or unused land. According to the BBS (2010) census there are approximately 37 million peoples living in coastal districts of Bangladesh. Due to lack of income a large number of people migrated to cities to work as day laborers for improves their livelihood status. It is expected that continuous population increase, coastal population is also supposed to be increased. Adoption of saline tolerant paddy rather than shrimp culture in coastal area will generate more scope of employment and also limit the migration of poor and landless farmers into urban areas (Suryanarayanan, 2010).

Whenever an innovation is generated, effort has been made to diffuse the innovation. Present days there is a crucial need to increase the rice production as the pressure of increased population. To gear up the food production farmers are being encouraged to adopt HYV rice cultivation technologies and their adoption skill produce positive blow to potential adopters who are always hesitate to adopt any new innovations. It was shown on in the past that many countries like Japan, Philippines; Indonesia has influential impact on rice production as well as agriculture when followed huge number of people to modern scientific innovations. It is most important concept and advantages of new technology should be spread out to the farmers as persuading and attractive manner, that's why farmer's response quickly as possible to adopting those innovations.

These will be helpful for planning   adaptive research, formulating extension messages and production plans. These   will help to understand the whole portrait of rice cultivation, adopted by the   farmers of char bata Union under Subarna char Upazila in Noakhali district. Studies on individual, group and society revealed that acceptance of modern technologies is conditional upon many factors. While conducting research, the entire factor like social, economical and situational factors takes into account. A very little research work tried to find out above facts. Therefore the present research felt necessity to conduct research entitled "Adoption of BRRI dhan- a salt tolerant variety 47 by the coastal farmers of Noakhali district."

1.2. Statement of the Problem

The level of adoption is determinate the success of any technology which depend on its diffusion among the potential users. When any technology introduced, it may fully adopt or partially adopt by the receivers. Discontinuity can also happen in this case regarding various factors. It is to be estimated that certain sustainable development can take place in the agriculture of Bangladesh, if the technology can be shifted accurately. Adoption of BRRI dhan 47 technologies are influenced by the farmer's demographic and socio-economic position. For wider adoption of BRRI dhan 47, it is necessary to have a clear understanding of the present status of farmers. Researchers, planners and extension workers can enhance their research, planning and execution of extension work by the measured relationship of adoption and farmer's characteristics of present study. In an outlook of previous discussion, the investigator took under a piece of study entitled, "Adoption of BRRI Dhan 47- a salt tolerant variety by the Coastal Farmers of Noakhali district".

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The purpose of this study was to have answers to the following research questions:-

> What is the extent of Salt Tolerant Variety BRRI Dhan 47 adopted by the coastal farmers of Noakhali district?

> What are the selected characteristics BRRI Dhan 47 cultivating farmers?

> What is the relationship between preferred characteristics of farmers with their adoption of BRRI dhan 47?

> What are the problems on adoption of BRRI dhan 47?

1.3. Specific Objectives

1. To determine and describe some selected characteristics of the farmers.

The selected characteristics are

a) Age

b) Education

c) Family size

d) Farm size

e) Annual Income

f) Organizational participation

g) Innovativeness

h) Extension contact

i) Knowledge on rice cultivation

2. To determine the extent of adoption of BRRI dhan 47 by the coastal farmers.

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3. To explore the relationship between the selected characteristics of the farmers' and their adoption of BRRI Dhan 47.

4. To describe the extent of problem faced by the farmers during cultivation of BRRI dhan 47.

1.4. Justification of the Study

The main focus of the study was to assess coastal farmers' adoption of Salt tolerant variety BRRI Dhan 47.The concluded result of the study especially valid to Noakhali district (the locale of the study). However, this measurement will also have implications for other coastal area of the country. It is true that BRRI dhan 47 released by BRRI mainly for coastal areas cultivation where soil are affected by the salinity.

Population boom in Bangladesh needs maximum use every cultivable land. So it is necessary to give attention on coastal areas while rice production low due to climatic factors for adequate food production. This idea indicates the need for an investigation to ascertain the relationship of the characteristics of farmers with their adoption of salt tolerant variety BRRI Dhan 47. The present study will be helpful to the researchers for further studies of similar nature and to the extension personnel who are directly involved in different agricultural program and to planners to making effective plans.

1.5. Limitation of the Study

In order to keep the study under manageable limit, the following limitations were recognized:

- The research was confined in three villages of one union in Subarnachar Upazila of Noakhali district.

- Only nine characters of BRRI dhan 47 growers were selected where lots of varying characters indeed. This was done to complete the study within limited resources and time.

- Data represented only one year's adoption of farmers condition which fixed by interviewer.

- The investigator depended on the data which furnished by the selected farmers from their memory during the interview.

- Head of the farm family were well thought-out as the population of the study.

- Establishing rapport with the farmers minimize unwillingness to provide information

- The researcher facing some irritating problem due to interfering interested side talkers at some stage in interview of target farmer. Researcher handles with sufficient skill as far as possible.

1.6. 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 and Hatt, 1952). That means the assumption is taken as a fact or belief to be true. While undertaking this research the researcher possessed the following assumptions in mind:

- The respondents are capable to furnish proper responses to the items included in the interview schedule.

> The researcher was well adapted with the study area and their social activities. The researcher collected data with utmost care and can be treated as reliable.

> The responses delivered by the respondents were good; they expressed their opinion and valid information on adoption of BRRI Dhan 47 variety.

> The findings of the study will have general application to other coastal parts of the country with similar socio-economic and cultural characteristics of the farmers of the study area.

1.7. Statement the Hypothesis

"A hypothesis is a proposition, which can be put to determine its validity" defined by Goode and Halt (1952). It seems prove may correct or incorrect contrary accord with common sense though lead to an empirical test. In studying relationship between variables a hypothesis is being projected. A null hypothesis states that there is no relationship between the concerned variable. The following null hypothesis would be formulated as there is no relationship between the selected characteristics of the farmers and their adoption of BRRI dhan 47.

1.8. Definition of Terms

A number of key terms have been used throughout the study are defined below to avoid confusion and misunderstanding.

Adoption

Adoption is the implementation of a decision to continue the full 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, then phenomenon is known as adoption (Ray, 1991).

Age

It means the age of a farmer that refers to the period of time from his/her birth to the time of investigation.

Education

Education of an individual farmer was defined as the formal education received up to certain level from any educational institute (e.g. School, College and University) at the time of interview.

Family Size

It refers to the total numbers of the family of BRRI dhan 47 growers of experimental area.

Farm size

It refers to the total area of target farmer's carries farming operation by own family. The area was estimated in terms of full benefit of the farmer's family.

Annual income

Annual income referred to the total annual earnings of all the family members of a respondent from agriculture, livestock, fisheries and other accessible sources (business, service, daily working etc) during a year. It is expressed in Taka

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Organizational participation

Organizational participation of an individual refers to his/her direct conduct with various organizations within a specific period of time. An individual could take part in various activities of organization as ordinary member, executive committee member or officer (president, secretary etc.).

Innovativeness

Innovativeness is the degree to which an individual is relatively earlier in adopting agricultural innovations, new ideas, practices and things than the other members of a social system (Rogers, 1995). This was comprehends by the quickness of accepting innovativeness by an individual in relation to others and was measured on the basis of time dimension.

Extension contact

It is referred to the respondent's becoming accessible to the influence of different information media through different extension teaching methods.

Knowledge on rice cultivation

It is the extent of basic understanding of the farmers about salinity. It also includes basic understanding which crops are suitable in saline soil and how to manage saline soil and crop cultivation.

Extent of adoption

The degree to which the farmer has actually adopted practice, defined by Ray (1991)

Innovation

An innovation is an idea, practices or object perceived as new by an individual. In This study BRRI dhan 47 is treated as innovation.

Farmers

It refers to those who cultivating crops. In This study BRRI dhan 47 cultivators are farmer.

BRRI dhan 47

It referred the modern variety introduced by Bangladesh Rice research Institute (BRRI) and taking the quality specially cultivating on salt affected area during boro season.

Problem

Problem refers to a difficulty about which something to be done. Problem faced by the farmers in this study was defined as the extent of difficulties faced by rice growers during cultivation of BRRI dhan 47.

Respondents

Peoples who gave answered questions by an interviewer for a social survey. They are the people from whom a social research worker usually gets most data required for his/her research.

Variable

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

Assumption

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

Hypothesis

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

Null hypothesis

The hypothesis which we pick for statistical test is null hypothesis. In This study the null hypothesis is stated that there is no relationship between the concerned variables.

Statistical test

A body of rules which help to take decision regarding acceptation or rejection of the hypothesis is defined as test. In This study if a null hypothesis is rejected it is assumed that there is a relationship between the variables

CHAPTER 2
REVIEW OF LITERATURE

The purpose of this study is to locate the relationship between adoption of salt tolerant variety BRRI Dhan 47 and selected characteristics of the farmers. This chapter contains review of literature which related to present study. The researcher made search the literature on a number of studies have been conducted on the adoption of innovations by the farmers. However the findings of such studies relevant to adopt different technologies by the farmers but there was no literature which directly related to present study. In This case other partial studies also reviewed in this chapter.

Three major sections has This chapter, the first one deals with the general context of adoption, the second section was among the relationship between farmer's characteristics and their adoption of innovation and third one through the conceptual framework of the study.

2.1. Review of literature general context of adoption of innovation

Singh *et al.* (1992) conducted a research in India on factors affecting the adoption of improved sugarcane production technologies. They found medium level of adoption in the maximum number of sugarcane growers and were partial adopters of the scientific recommendations of sugarcane production technology.

Khan (1993) carried out a research on the insecticides adoption and relevant issue in the pachar union of Madaripur district. He monitored that, 7% had no adoption, 57% had low adoption, 32% had medium adoption and only 4% had high adoption among the respondents.

Famers may also be more willing to adopt new technologies if their financial risks were reduced through *insurance schemes* to protect against crop failure e.g. due to drought or floods. Insurance schemes for smallholders are subject to similar challenges as credit, however. In particular monitoring and paying out dispersed and small insurance claims can be costly for the insurer (Poulton et al. 2006).

Nikhade *et al.* (1993) found that the adoption rate was cent percent on improved practices of soybean cultivation. More than 82% had complete adoption with improved practices like sowing, spacing, and intercultural operations.

Siddaramaiha *et al.* *(1995)* carried out the result, almost cent percent adoption about the study of improved Seri-cultural practices along with big and small farmers. Their recommended improved practices were optimum time of planting (95%), adoption of recommended spacing (91.25%), recommended irrigation schedule (93.75%), and used improved variety of mulberry crop (87.50%). Approximately half of the respondents used quantity of farmyard manure and plant protection measure in mulberry cultivation.

Islam (1996) conducted a study under sustainable agriculture development framework on farmer's use of indigenous technical knowledge (ITK). He found that, 42.73% lower user category, 41.82% in medium user and only 15.45% in the higher user category.

Rahman (1999) considered a study on the adoption of balanced fertilizer by the boro rice farmers of Ishwarganj Thana. The research showed that, extent use of balanced nitrogenous fertilizer had optimum adoption. On the other hand, adoption of balanced phosphoric fertilizer and balanced potassic fertilizer had below optimum adoption.

Haider *et al (2001)* studied the adoption level of improved package for T. aman rice cultivation in Gouripur upazila of Mymensingh district. He categorized the farmers into non-adopters, low adopters medium adopters, high adopters which was 5%, 62%, 24.5% and 8.5%, respectively. Majority percent adopted MV program of T. aman rice.

Islam (2002) performed a study on adoption of modern agricultural technologies by the farmers of Sandwip. The study revealed that 69% of farmers had medium adoption while 13% had low adoption and 18% had high adoption of modern agricultural technologies.

Aurangojeb (2002) studied on the extent of adoption of integrated farming technology by the rural women in RDRS. He observed that 64%% rural women used high level, while 28%% used medium level of integrated homestead farming technologies. Only 8%% women had low level of adoption.

Swinkels *et al.* (2002) considered a study on western Kenya of assessment the adoption potential of hedgerow intercropping for improving soil fertility. They found that, hedgerow intercropping had greater adoption potential if its aims provided feed for an intensive dairy operation or for reduced soil erosion.

Sarder (2002) conducted research on adoption of IPM practices by the farmers under PETRRA Project of RDRS. Major percent age (45.9) of farmers had medium adoption, 38.3% had low and only 15.8 percent had high adoption of IPM practices.

Rahman (2003) exposed that 47% growers had medium adoption, 44% had low adoption about adoption of year round homestead fruit cultivation practices. In that case only 1% was on high adoption category.

Haque (2003) carried out a study about adoption on maize cultivation technologies. Experiment showed most of the growers under medium adopters' category while28% high adopters and 25% low adopters.

Salam (2003) found that a devastating majority which was 94% of respondents facing high constraints in adopting environmentally friendly farming practices. Six percent had medium constraints and no number of farmers found on low constraint.

Hossain (2006) studied on adoption of selected high yielding varieties of rice. He furnished that highest number of farmers (49%) had medium adoption. High adoption was 26% and 25% was under low adoption.

2.2. Relationship between farmer's characteristics and their adoption of innovation

2.2.1. Age and adoption of agricultural technology

Okoro and Obibuaka (1992) calculated that a positive relationship between education of the respondents and their adoption of recommended management practices on the research among the small holders in IMO state, Nigeria of their adoption of recommended practices.

Islam (1993) experimental research showed that there was no association between the potato growers and their adoption of improved practices in potato cultivation.

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.

Sardar (2002) found that the age of the farmers had positive significant negative correlation with their adoption of IPM practices.

Hossain (2003) revealed that age of the farmers had a insignificant and positive relationship with their adoption of modern Boro rice cultivation practices.

Aurangozeb (2002) found that there was significant negative relationship involved on age and adoption of integrated homestead farming technologies.

Hoque (2005) reported that age of rice growers and the adoption of rice varieties were not correlated in his experiment to determine the relationship of farmer's characteristics with their adoption of modern Boro rice cultivation practices.

Hossain (2006) revealed that age of the farmers had an insignificant and positive relationship with their adoption of selected HYV rice cultivation practices.

2.2.2. Level of education and adoption of agricultural technology

Alam (1997) observed that education level of the farmers had significant positive relationship with the use of improved farm practices.

Similarly Sarker (1997) found positive relationship about the affiliation of education and adoption of improved technologies.

Hussen (2001) point out that the education and adoption of modern sugarcane cultivation practices had positive significant relationship.

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 academic qualifications of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

Hossain (2003) concluded that education of the farmers had a significant and positive relationship with their adoption and modern Boro rice cultivation practices.

Hossain (2006) accomplished that education of the farmers and their adoption of selected HYV rice had a significant positive relationship. Similar findings occurred on Khan (1993), Haque (1993) and Hamid (1995).

However, much of the focus of the adoption literature has been on the individual farmers (e.g. the attitude or personality of the farmers or their socio-economic characteristics, such as wealth, landholding or education) and the characteristics of the technologies, rather than the context in which technology adoption and diffusion takes place (Marra et al. 2003).

2.2.3. Family size and adoption of agricultural technology

Kashem (1987) experimented in his study about the small farmers constraints to the adoption of Modern rice technology. In his research he not found any relationship between family size and adoption of Modern rice technology.

Rathore and Shakhawat (1990) monitored that the knowledge about improved agricultural practices of Bajra cultivation by farmwomen was found significantly associated with their family size.

Roy (1997) conducted a research about the adoption of IPM practices by the boro rice growers and he furnished that family size of the Boro rice growers had no significant relationship and the adoption of IPM practices.

Chowdhury (1997) considered a study on the adoption of selected BINA technologies by the farmers of Boira union of Mymensingh district. He watched that family size had positive significant relationship with the adoption of selected technologies of BINA.

Rabbany (2003) illustrated on his experiment that family size of the farmers had no association with the use of their IPM practices.

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Islam (2007) found on his/her study there was no significant relationship between family size and the adoption of BRRI Dhan 29 production technologies.

2.2.4. Farm size and adoption of agricultural technology

Hosssain (1983) found that a negative relationship on farm size of farmer's of Bhabakhali union of Mymensingh district and their adoption of HYV T-Aman rice.

Mustafi *et al* (1987) in their research about the adoption of modern varieties of rice in Bangladesh observed that size of the farm had significant and positive relationship with the adoption.

Khan (1993) considered a study on adoption of insecticides and related issues in the village of pachon union, Madaripur district and delivered findings that farm size was positively related to the adoption of insecticides.

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

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 farm size of the farmers had a significant and positive relationship with their adoption of Aalok 6201 hybrid rice.

Hossain (2003) concluded that farm size of the farmers had a significant and Positive relationship with their adoption and modern Boro rice cultivation practices.

2.2.5. Annual Family income and adoption of agricultural technology

Access to financial resources and services is another important enabling factor for technology adoption, in particular where financial capital is required to obtain the technologies and associated inputs. Wealthier farmers or those with off-farm income may be more willing to bear the financial risk in case the technology does not perform well (Marra et al. 2003).

Sarker (1997) found that family income of potato growers had significant positive relations with their adoption of improved potato cultivation practices.

Similar results were observed by Hossain (1999), Rahman (1986), Kashem (1991), Pal (1995), Islam (1993), Khan (1993), Islam (1996) found a significant negative relationship between the annual income of the farmers and their extent of use of ITK selected technologies.

Irz et al. (2001) reported that gains from new agricultural technology have influenced the poor directly, by raising incomes of farm households, and indirectly, by raising employment, wage rates of functionally landless laborers', and by lowering the price of food staples.

Hussen (2001) found that the annual income 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 upazila of Mymensingh district. He found that annual income of the farmers had a significant and positive relationship with their adoption of Aalok 6201 hybrid rice.

Aurangozeb (2002) observed that there was a positive relationship between annual income from field crop and adoption of integrated homestead farming technologies.

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Hossain (2003) revealed that annual income of the farmers had a significant relationship with their adoption at modern Boro rice cultivation practices.

Hossain (2006) revealed that annual income of the farmers had a significant relationship with their adoption at selected HYV rice cultivation practices.

2.2.6. Organizational participation and adoption of agricultural technology

Balasubramanian and kaul (1985) studied on adoption of improved practices by fish trawler owner in kerala and they indicated no affiliation between organizational participation and adoption of improved practices.

Rahman (1995) in his experiment located that organizational participation of potato growers and their knowledge considering improved practices of potato cultivation had no relationship.

Alam (1997) conducted a study about use of improved practices in rice cultivation by the farmers. He was not found relationship adoption of improved farm practices among the farmer's organizational participation.

Hossain (2000) found on his study there was insignificant relationship between organizational participation of the framers and their knowledge on Binadhan-6.

Hossain (2003) furnished that organizational participation of the farmers and adoption of modern boro rice cultivation had no significant association.

Hossain (2006) found in his research knowledge on selected HYV rice cultivation that insignificant relationship between organizational   participation of the framers and their knowledge.

Banking facilities offered through bank branches or mobile banking can enable technology adoption by offering transmission services to pay for agricultural technologies or inputs, or to repay loans (Poulton et al. 2006).

2.2.7. Innovativeness and adoption of agricultural technology

Mohammad (1974) undertook an investigation on the farmers' adoption of insect control measures and related aspects. He reported that innovativeness of the farmers had positive and significant association with their adoption of insect control measures.

Kashem and Halim (1991) reported that innovativeness of the farmers had significant positive relationship with their adoption of modern rice technology use of communication media in live stock production.

Hossain (1999) found positive significant relationship between innovativeness of the farmer and their adoption of fertilizer and also observed no relationship with adoption pesticide.

Aurangozeb (2002) observed that there was significant relationship between innovativeness and adoption of integrated homestead farming technology.

Rahman (2003) revealed that the highest proportion (63%) at the farmers had low innovativeness as compared to 22% medium innovativeness and 15% very low innovativeness.

Islam (2002) conducted a research study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that innovativeness of the farmers had significant and positive relationship with their modern agricultural technologies.

2.2.8. Extension contact and adoption of agricultural technology

Information from external sources, such as agricultural extension agents, m-services, radio, TV or newspapers, can play a central role in the assessment of suitability and risk of a technology. A study of maize adoption in Tanzania, for

instance, showed that high intensity of extension services was one of the major factors positively influencing the adoption of improved seeds (Kaliba et al. 2000). Importantly, farmers will also require the necessary information to assess the suitability of the technology for their farming system and to understand the potential risks associated with the use of the technology. For instance, farmers may be uncertain about the profitability of the new technology or differences in economic returns between new and old technologies. Such uncertainties may arise due to insufficient knowledge about yields. (Abadi Ghadim & Pannell, 1999).

Rahman (2001) carried out a study on the topic of on knowledge, attitude and adoption of farmer's regarding Aalok 6201 hybrid rice in Mymensingh sadar Thana. His experimented result showed extension contact had a significant positive relationship among the farmer's adoption.

Sardar (2002) concluded that the extension contact had positively significant Relationship with their adoption of IPM practices.

Haque (2003) concluded that extension contact of the farmers had a significant positive relationship with their adoption of modern maize cultivation technologies.

Hossain (2004) concluded that extension contact of the farmers had a significant positive relationship with their adoption of modern Boro rice cultivation practices.

2.2.9. Knowledge on rice cultivation and adoption of agricultural technology

Koch (1985) conducted a study in the North western organize free state, South Africa concerning perception of agricultural innovations aspiration, knowledge and innovation adoption. He observed that there was a strong positive relationship between knowledge and practice adoption. This finding was very much in agreed with Rogers and Shoemaker (1971).

Reddy *et al.* (1987) found that the significant association between knowledge and use of improved package of practices in paddy production by participant and non-participant farmers.

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) in his study revealed that agricultural knowledge of the farmers had significant and positive relationship with their adoption of IPM practices.

Sarker (1997) found that potato production knowledge of potato growers had a positive and significant relationship with their adoption of improved potato cultivation practices. Ali *et.al* (1986), Muttaleb (1995) and Rahman (1995) observed similar results in their respective studies.

Haque (2003) concluded that knowledge in maize cultivation of the farmers had a significant positive relationship with their adoption of modern maize cultivation technologies.

Sarder (2002) studied adoption of IPM practices by the farmers under PETRRA project of BDRS. He found that agricultural knowledge had positive significant relationship with their adoption of IPM practices.

Rabbany (2003) conducted a study on use of IPM practices by the farmers in rice cultivation. He found that knowledge on IPM had positive significant relationship with their use of practices.

Hossain (2006) revealed that knowledge on HYV rice of the farmers had a high significant relationship with their adoption at selected HYV rice cultivation practices.

2.3. The Conceptual Framework of the study

Review of the past studies and literature indicated various factors influenced the adoption of salt tolerant variety BRRI dhan 47 by the farmers. It is sometimes difficult to deal with all the factors in a single study. Related literature, resources at hand helped the researcher in selecting nine variables to assess the adoption of BRRI dhan 47 by the farmers.

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research while constructed properly contains at least two important elements i.e. "a dependent variable" and "an independent variable". An independent variable is that factor which is manipulated by the researcher in his/her attempt to ascertain its relationship to an observed phenomenon. In view of prime findings of review literature, the researcher constructed a conceptual framework of the study, which is self-explanatory and is presented below:

Independent Variable	Dependent Variable

Age

Education

Family size

Farm size

Annual income

Organizational participation

Innovativeness

Extension contact

Knowledge on rice cultivation

Adoption of BRRI dhan 47

Problems faced by the farmers
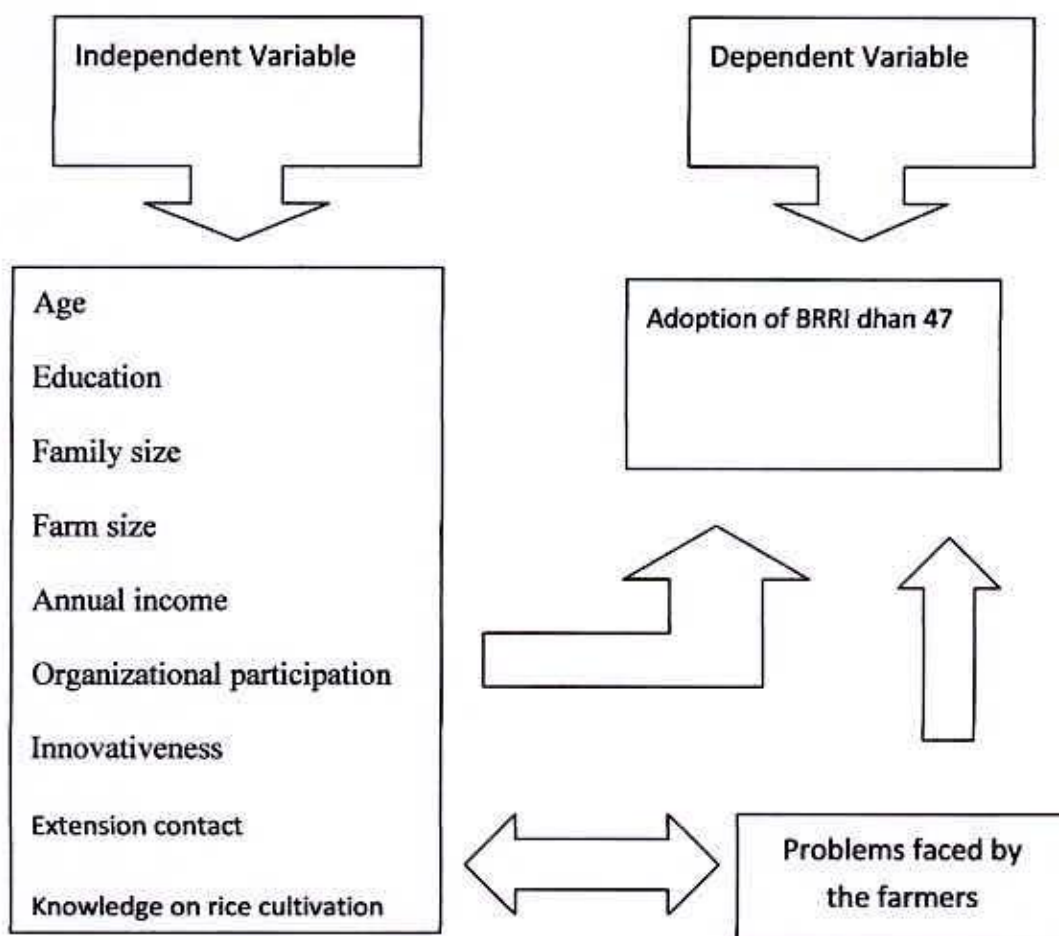
Fig: 2.1 Conceptual framework of the study

CHAPTER 3
METHODOLOGY

Methodology offers research guideline to a researcher so that, s/he moves properly toward scientific investigation to establish new knowledge, new facts and theory. It is very much important for a topic of social investigation and exhaustive experimentation. It enables the researcher to collect valid and reliable data according to the objectives of the study. It also enables her/him to formulate research hypothesis and to analyze data to arrive at meaningful consideration. Methodology of a research describes locale of the study, population and sampling, preparation of research instruments, measurement of variables, statistical tests etc, which have been stated below:

3.1 Locale of the study

Noakhali is one of the coastal districts in Bangladesh having salinity problem on cultivable land and due to sea level increasing now a days it's a major problem on rice cultivation. BRRI Dhan 47 is most appropriate salt tolerant variety at this occasion in that area. Subarna char upazila of Noakhali District considered as most suitable location to conducting research on adoption of salt tolerant variety BRRI Dhan 47 by the rice growing farmer's. The findings of the present study can be a key in extending the adoption of BRRI Dhan 47 variety of rice in the country Subarnachar upazila under Noakhali district was purposively selected as a locale of the study. This area situated near the Bay of Bengal which is demarked as a coastal area. There are six unions in Subarnachar upazila namely Char jabbar, Char wapda, Char jubilee, Char amanullah, Char bata, and Char clerk. The Charbata union was randomly selected out of six unions. It has thirteen villages. Out of thirteen villages

three villages were randomly selected namely Char bata, Khaser hat and Saheber hat for the study.

3.2. Population and Sampling Design

An up to date list of all farm family heads of three selected villages were made with the help of pilot survey and Sub-Assistant Agriculture Officer. The list comprised a total of 334 farmers in the study area. These farmers constituted the population of this study. There were 172 farmers in Char bata, 97 farmers in Khaser hat and 65 farmers in Saheber hat. Population of each village was randomly selected at the rate of 30 percent as representative number using table of random numbers (Kerlinger, 1973). Thus, the sample size for Char bata was 52, Khaser hat was 29 and Saheber hat was 19 making the total sample size of 100 farmers. A reserve list of ten farmers was also prepared by the same method so that the respondents of this list could be used for interview if the respondent's included in the original samples were not available at the time of data collection. The distribution of population sample and number of farmers in the reserve list are shown in Table 3.1.

Table 3.1 Distribution of population and sample of respondents in three selected villages under Char bata union of Subarnachar upazila

SI. No	Name of the village	Population	Sample size	Number of farmers in reserve list
1	Char bata	172	52	5
2	Khaser hat	97	29	3
3	Saheber hat	65	19	2
Total		334	100	10
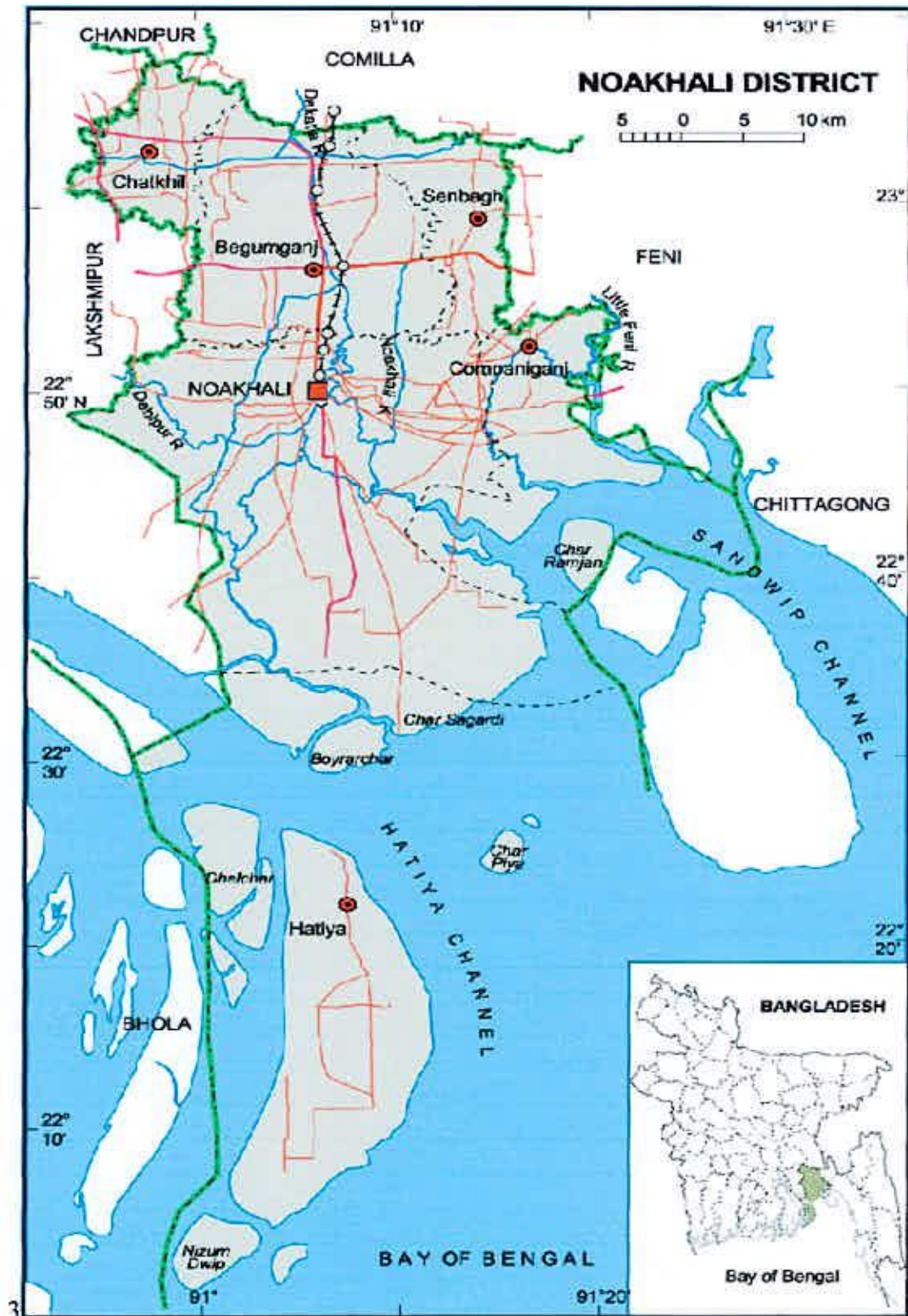
Fig 3.1 A Map of Noakhali District which showing local area.

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Fig 3.2 A Map of Subarna Char Upazila showing study area

3.3 Data Collection Instrument

To collect relevant information from the selected respondents, an interview schedule was carefully designed to fix spotlight on the objectives of the study. The questions and statements contained in the schedule were simple, direct and easily understandable by the farmers in one hand and different scales, closed and open form questions were exerted in the interview schedule to obtain necessary information on the other. Appropriate scales were also developed to measure the characteristics of farmers.

3.4 Pilot testing and final version

Considering the suggestion from Brog and Gall (1979) the interview schedule was pretested among the similar group of farmers, who were not included in the sampling , this was done to determine the validity of the instrument. The researcher modified and corrected the interview schedule after piloting. After necessary correction and modification final draft of interview schedule was prepared for data collection.

3.5 Data collection

Data were collected personally from the selected BRRI dhan 47 growers by the researcher herself in a face to face situation. The researcher made all possible efforts to explain the purpose of the study to the farmers. Rapport was established and local accent and dialect was used during data collection conversation. Before interview appointment was sought from each of the respondents. As a result no serious problem was encounted and the respondents answered without hesitation. The data collected period was 20 October to 10 November of 2012. It is to be

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mentioned that all the data collection activities were done with the help of sub assistant agricultural officers.

3.6 Data coding and Tabulation

A detailed coding plan was set. Qualitative data transferred into qualitative data. These were then compiled, analyzed in accordance with objectives of the study using computer software.

3.7 Variables of the study

Variable means a general indication in statistical research of characteristic that occurs in a number of individuals, objects, groups etc. and that can take on various values, for example the age of an individual. Research hypothesis variables are two types named independent variables and dependent variables.

It is the most important part to measure variables in any descriptive research work. Independent variable is defined as the factor, which is operated by the experimenter to determine its association to an observed experience. A dependent variable is thing that actually experimenter's introduces or removes depends on independent variable. Measurements of the variables of this study are discussed below:

3.7.1 Measurement of independent variables

The independent variables of this study were nine (9) selected characteristics of the BRRI dhan 47 rice farmers. These were: age, education, family size, farm size, annual family income, organizational participation, Innovativeness, extension contact and knowledge on rice cultivation. The procedures of measuring the independent variables are briefly discussed below:

3.7.1.1 Age

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

3.7.1.2. Education

Education of a respondent was measured by the number of years of schooling s/he completed in formal and non-formal educational institutions. A score of one (1) was assigned for each year of schooling. For example, if a respondent did not know how to read and write, s/he was given a score of zero (0) and one (1) for each year of schooling completed.

3.7.1.3. Family size

Family size of a respondent was measured in term of number of members in his/her family including him/her self. That is, His/her family members including wife/husband, sons, daughters, brothers, sisters, parents, and any other person who jointly live and ate together during interview. The scoring was done by the actual number was mentioned. For example, if a farmer had five family members that means his/her family size score was five (5).

3.7.1.4. Farm size

Farm size of the respondent farmer was measured on the basis of total area of land s/he possessed during interview on which s/he was engaged in farm practices for economic benefits. The area was being estimated in terms of full benefit to the growers or his/her family. The farm size of a respondent was measured by using

the following formula:

$$Fs = A1 + A2 + 1/2 (A3 + A4) + A5$$

Where,

   Fs= Farm size

   $A1$= Homestead area (with pond)

   $A2$= Own land under own cultivation

   $A3$= Own land given to others on *borga*

   $A4$= Land taken from others on *borga*

   $A5$= Land taken from others on lease

3.7.1.5. Annual family income

Annual family income of a respondent was measured on the basis of total yearly earning from agriculture and other sources (service, business, daily labor etc.) by the respondent him/herself and other family members. The value of all the agricultural products comprising crops, livestock, fisheries, fruits, vegetables etc. were taken into consideration. For calculation of annual income, one (1) score was assigned for each thousand taka of income. If a farmer had annual income of 5 lacs his/her annual family income would be 500.

3.7.1.6. Organizational participation

Organizational participation of a respondent was measured by his/her nature of membership in different organizations for a particular period of time. This was measured on the basis of participation by the respondent in different organizations. Score was assigned for participation of respondents in an organization in the following manner.

   $O_p = N_p + O_m + E_m + E_o$

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	Score
Op = Organizational participation	
N_p = No participation)	0
O_m = Participation as ordinary member	1
E_m = Member of the Executive committee ()	2
E_o = Executive officer	3

The possible range 0-21 where 0 specify no organizational participation and 21 indicates high participation.

3.7.1.7. Innovativeness

According to E.H. Rogers, Innovativeness is the how earlier a person adopt a technology within a serial system. Innovativeness of a respondent was measured on the basis of his/her earlier or later adoption of 10 improved agricultural practices than the other member of his/her sowed system. The score were assigned on the basis of time required adoption by an individual to adopt each of the practices in the following manner:

Period of adoption	Score
Within 1-2 years	3
Within 3-4 years	2
Within 5 or above	1
Not at all	0

Innovativeness score of a respondent farmer was obtained by adding his/her scores for adoption of all the 10 selected improved agricultural practices. Innovativeness score of a respondent farmer could range 0- 30, where 0 indicating no innovativeness and 30 score indicating very high innovativeness.

3.7.1.8 Extension media contact

Extension media contact of a respondent was measured by computing an extension contact score on the basis his/her extension media contact with ten selected extension media. Respondents mentioned the nature of his/her conduct by putting a tick mark against any one of the four responses – no contact at all, rarely, occasionally, off and on and regularly. The score for each respondent was determined by adding his/her response to all the items on the basis o his/her frequency of contact with information sources. The scene was assigned against the extent of media contact in the following manner:

$$No\ contact \text{----------} 0$$

$$Rarely \text{--------------} 1$$

$$Occasionally \text{--------} 2$$

$$Often \text{----------} 3$$

$$Regularly \text{----------} 4$$

The extension media contact score of the respondents could range 0- 40, where 0 indicating no extension media contact and 40 indicates very high extension media contact.

3.7.1.9. Knowledge on rice cultivation

Knowledge on rice cultivation was measured on the basis of scoring against questions. Each question was assigned 2 score. Full score was given for full correct answer; partial number was given for partial correct answer. So, if a respondent could give correct answer of 15 questions s/he will obtain a score of 30. Wrong answer was assigned by zero. So a respondent could get zero if he/she answer wrong all the 15 questions. So the possible range of knowledge on rice cultivation

could be 0- 30, where 0 indicated no knowledge and 30 for highest level of knowledge.

3.7.2. Measurement of dependent variable

Adoption of Salt tolerant variety BRRI dhan 47

The dependent variable of this study was adoption of salt tolerant variety BRRI dhan 47. The procedure followed in measuring the dependent variable has been presented below:

The adoption of salt tolerant variety BRRI dhan 47 was measured computing adoption formula. It was calculated using the equation about the area coverage adoption founded by Prof. Mohammad Hossain Bhuiyan (2005) (Modified formula of Chattapadya) which is as below:

$$\text{Extent of adoption} = \frac{e}{p} \times 100$$

Where,   e = Area under BRRI dhan 47 cultivated by a farmer

p = Total area under rice cultivation by a farmer

According to formula, it was calculated that, a respondent cultivating of BRRI dhan 47 on how much land against his/her total cultivable land and expressed in terms of percentage.

3.8 Problems faced by the farmer in adoption of BRRI dhan 47

It was measured by using a four point rating scale. A list of 10 probable problems that farmers could face in different aspects were listed and asked to indicate the

extent of their problem confrontation. For each problem sore of 3, 2, 1, and o were assigned to indicate extent of problem as high, moderate, little and not at all respectively. The problem confrontation score was computed for each respondent by adding his/her scores for all 10 problems. The possible range of problem confrontation scores thus could be 0 and 30. A total score of 30 indicated severe problem in the BRRI dhan 47 cultivation while score 0 indicated no problem on the BRRI dhan 47 cultivation. To ascertain the comparison among the problems a Problem Faced Index (PFI) was computed using following formula:

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

Where

PFI= Problem faced index

P_h= Percent of BRRI dhan 47 growers having high problem

P_m= Percent of BRRI dhan 47 growers having moderate problem

P_l= Percent of BRRI dhan 47 growers having low problem

P_n = Percent of BRRI dhan 47 growers having no problem at all.

3.9. Statement of the Hypothesis

As defined by Goode and Hatt (1952) "A hypothesis, which can be put to a test to determine its validity. It may be seen 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." In studying the relationship between variables, research hypotheses are formulated which state the anticipated relationship between the variables. However, for statistical test it becomes necessary to formulate null hypothesis. A

null hypothesis states that there is no relationship between the variables. If a null hypothesis is rejected on the basis of a statistical test, it is assumed that there is a relationship between the concerned variables. In this study the null hypothesis was formulated as:

"There was no relationship between the farmers selected characteristics and their adoption of BRRI dhan 47."

The characteristics were: age, education, family size, farm size, annual income, organizational participation, innovativeness extension media conduct, and knowledge on rice cultivation.

3.10. Statistical Analysis

The statistical measures such as number and percentage, mean and standard deviation distribution were used for describing the variables of the study. In order to explore the relationships between the adoption of salt tolerant variety BRRI dhan 47 and the selected characteristics of the farmers, the Pearson Product Moment Correlation coefficient was computed. Five percent (0.05) and one percent (0.01) level of significance was used as the basis of rejecting any null hypothesis.

CHAPTER 4
RESULT AND DISCUSSION

The findings of the study and interpretations of the results have been presented in this Chapter. The first section deals with the selected characteristics of the respondents, while the second section deals with the adoption of salt tolerant variety BRRI dhan 47. In the third section, the relationships between the extent of adoption of salt tolerant variety BRRI dhan 47and the selected characteristics of farmers have been discussed.

4.1. Selected Characteristics of the Farmers (independent variables)

Nine characteristics of the farmers were selected to find out their relationships with the adoption of salt tolerant variety BRRI dhan 47. The farmer's characteristics were age, education, farm size, family size, annual income, organizational participation, innovativeness, extension media conduct and knowledge on rice cultivation. These characteristics of the farmers are described in this section. The results on the selected characteristics with the farmers are presented in Table 4.1

Table 4.1 Salient features of the respondents with their characteristics

Characteristics	Measuring Unit	Range possible	Range Obtained	Category	Farmers No.	Farmers %	Mean	Standard deviation
Age	Actual years	-	29-65	Young aged(up to 35yrs)	39	39	39.70	8.26
				Middle aged(36-50 yrs)	48	48		
				Old (above 50 yrs)	13	13		
Education	Years of schooling	0-16	0-16	No Education	19	19	4.66	2.72
				Primary level(1-5)	46	46		
				Secondary level(6-10)	32	32		
				Above secondary(above 10)	3	3		
Family size	Actual number		2-9	Small(below 5)	18	38	5.34	1.92
				Medium(5-7)	60	60		
				Large(above 7)	22	2		
Farm size	Hectare	-	0.030-3.41	Small(below 1 ha)	51	51	1.20	.77
				Medium(1-3 ha)	44	44		
				Large(above 3 ha)	5	5		
Annual income	Unit score	-	70-340	Low(up to 160)	13	13	176.977	72.24
				Medium(161-250)	66	66		
				High(251-340)	11	11		
Organizational participation	Scale score	0-21	0-7	No participation (0)	18	18	2.61	1.6
				Very low (up to 4)	65	65		
				Low (5-7)	17	17		
Innovativeness	Scale score	0-30	0-15	No innovation (0)	8	8	9.35	2.30
				Low (up to 7)	72	72		
				Medium (8-15)	20	20		
Extension media contact	Scale score	0-40	5-24	Low (up to 11)	13	13	14.78	5.08
				Medium(12-18)	64	64		
				High (19-24)	23	23		
Knowledge on rice cultivation	Scale score	0-30	3-21	Low (3-8)	17	17	12.73	4.5
				Medium(9- 15)	70	70		
				High(16-21)	13	13		

4.1.1. Age

The scene of age of the respondent farmers ranged from 29 to 65, the average being 39.70 and the standard deviation was 8.26. On the basis of age, the farmers were classified into three categories: Young aged (up to 35), middle aged (36-50) and old aged (above 50). Data presented in Table 4.1 indicated that the highest proportion (48%) of the respondents fell in the middle aged category compared to 39% young aged category and 13% farmers were found to be old. Young people are generally receptive to new ideas and things. They have a favorable attitude towards new idea. However, the older farmers because of their longer farm experience might have valuable opinions in regard to adoption of innovation. Middle aged farmers would have more interest to adopt new ideas. Sometimes traditional beliefs and dogmatism may be obstacle of innovation-decision of old aged farmers but the middle aged and young farmers help them to be get rid of from such obstacle. The extension agents should use young and middle aged farmers as opinion leaders.

4.1.2. Education

The education score of the respondents ranged from 0 to 16, the average being 4.66 and the standard deviation was 2.72. Based on their level of education, the respondents were grouped into four categories: no education (0), primary level (1-5), secondary level (6-10), and above secondary (above10). Data presented in Table 4.1 indicate that a large proportion (46%) of the respondents fell under category of primary level education and 32% secondary level education while 19% farmers under no education category. Only 3% people have above secondary level of education. The data contained in the table indicate that about four- fifties of the

respondents of the study area had education ranged from primary to above secondary. It is higher than national average. Education can enlighten a family, a society and nation. It may contribute to the adoption of BRRI dhan 47. Literacy percentage must be sustain and increase in the study area for the sake of adoption of agricultural innovations. The findings indicate that education of an individual is likely to be more receptive to the modern facts and ideas; they have much mental strength in deciding on a matter related to problem solving or adoption of technologies in their daily life. Thus, literate farming community is considered as a suitable ground for the adoption of technologies, or execution of change programmed whatever needed.

4.1.3 Family size

The family size score of the farmers ranged from 2 to 9 with average 5.34 and standard deviation 1.92. According to their family size, the farmers were classified into three categories: small (below 5), medium (5-7) and large (above 7). Data presented on Tale 4.1 have shown that, the highest proportion (60%) of the farmers fell under the medium family category compared to 22% having large family. Only 18% was under small family category. Family size can influence adoption of innovation. Small to medium size family members' are more eager to take risk and have potentiality to take chance in case of new innovation. On the other hand large family members' always busy to fulfill their basic needs and are afraid of loss of income due to adoption of BRRI dhan 47. Lack of awareness and less adoption of family planning among the farmers are highly responsible for large family size. However, in the studying area average family size (5.34) is not higher than national average which can contribute in the agro-economic development of Bangladesh

4.1.4. Farm size

The farm size score ranged from 0.030 to 3.41 ha. The average was being 1.20 with a standard deviation of 0.77. Based on the obtained score the respondents were classified into three categories, such as small farm size (below 1 ha), medium farm size (1-3 ha) and large farm size (above 3ha). The highest proportion (51%) of the farmers had small farm compared to 44% had medium farm and 5% having large farm (Table 4.1). The average farm size of the farmers of the study area is small. This might be due to the fact that the farmers of the study area were under high density of population. Small farm size of a farmer was has lower capability to take risk adopt new ideas or innovation where medium to large farm size has chances to experiment of any innovation either profitable or loss. So large farm size can influenced farmers to adoption of innovation like BRRI dhan 47.

4.1.5. Annual income

Annual income score of the respondents ranged from 70 to 340 with a mean of 176.977 and standard deviation of 72.24. Respondents were categorized into three categories according to annual income. The category: low income (up to160), medium income (161-250), high income (251-340). Data shown in Table 4.1 indicate that two-thirds (66%) of the respondents have medium annul income compared to 13% low income group and 21% high income group. The average income of the farmers of the study area was a standard compared to the national average income. This might be due to the fact that the farmers of the study area were not only engaged in agriculture. They also earn from other sources such as service, business etc. Farmers with the low income generally hesitate to adopt

innovations in their own farms because of their lower risk bearing ability and their inability to make necessary financial investment.

4.1.6. Organizational participation

The observed organizational participation scores of the farmers ranged from 0 to 7 against the possible range 0-21 with an average of 2.61 and standard deviation of 1.6. Depending on the organizational participation scores, the farmers were classified into three categories namely; no participation (0), very low participation (up to 4), and low participation (5-7). Data contained in Table 4.1 revealed that the major proportion (65%) of the farmers had very low organizational participation as compared to 18% having no participation and 17% had low participation. So it was concluded that majority of the farmer in the study area had very low organizational participation. Organizational participation can influence adoption of BRRI dhan 47 or any other technology. Linking up with any organization and active participation, farmers increase awareness and interest about new things, ideas and beliefs. That's why when an innovation comes to them they can be easily aware of decision and adopt the technology.

4.1.7. Innovativeness

The innovativeness score of the respondent ranged from 0-15 against the possible range 0-30. However, the average was 9.35 and the standard deviation of 2.30. Based on their innovativeness score, the respondent were classified in to three categories: no innovativeness (0), low innovativeness (up to 7) and medium innovativeness (8-15). Data contained in the table indicate that highest proportion (72%) of the farmers had low innovativeness as compared to 20% medium

innovativeness and only 8% had no innovativeness (Table 4.1). Data also revealed that majority (80%) of the respondent farmers of the study area had no to low level of innovativeness. It may be concluded that all the farmers of the study area were not so much innovative. Innovativeness of a farmer can influence on the adoption BRRI dhan 47 because if farmers do understand that new technology has high relative advantages, compatibility with cropping system, simple to practice then persuasion and adoption will occur among the farmers towards particular innovation like BRRI dhan 47.

4.1.8. Extension media contact

The computed extension media contact scores of the respondents ranged from 5 to 24 with an average of 14.78 and standard deviation of 5.08 against the possible range of 0 to 40. On the basis of extension media contact scores, the respondents were classified into three categories: Low extension contact (up to 11), medium extension contact (12-18) and high extension contact (19-24). Data contained in the table 4.1 that, the majority of the farmers of the study area had medium extension contact (64%), while 23% had high extension contact and 13% had low extension contact. The findings of the study indicated that majority of the respondents had medium to high extension contact for getting necessary agricultural innovations information. Extension contacts have high influence on adoption of innovation by the farmers. Generally a farmer gets information from extension agents about improved crop varieties or improved agricultural practices followed by result demonstration, method demonstration, farmers' training etc. influence farmers in adoption of innovation like BRRI dhan-47.

4.1.9. Knowledge on rice cultivation

Knowledge on rice cultivation scores of the respondents ranged from 3-21 with an average of 12.73 and standard deviation of 4.5 against the possible range 0 to 30. Knowledge score about salinity of the respondents were classified into three categories as low knowledge (3-7), medium knowledge (9-15) and high knowledge (16-21). The majority (70%) of the farmers had medium knowledge compared to 17% had low knowledge and 13% possessed high knowledge (Table 4.1). It reveals that an overwhelming majority (83%) of the farmers in the study area had medium to high knowledge on rice cultivation. Knowledge on rice cultivation is helpful to adopt any rice technology. Farmers' knowledge helps them to find out their problem and about the solution as well. When farmers have proper knowledge on rice cultivation they apply their knowledge and be able to find out scientific efforts in rice cultivation so that they can contribute to the national food production demand.

4.2. Adoption of Salt tolerant variety BRRI dhan 47 by the farmers

The adoption of BRRI dhan 47 by the respondent ranged from 6.67 to 70.06% against the possible range 0 to 100, the average being was 25.67 with a standard deviation of 14.06. Based on the adoption scores the respondents were classified into three categories, Low adoption (up to 27), medium adoption (28 to 49) and high adoption (above 49).

Table 4.2 Distribution of farmers according to their extent of adoption of salt tolerant variety BRRI dhan 47

Categories	Number	Percentage	Mean	SD
Low (up to 27)	53	53	25.67	14.06
Medium(28-49)	42	42		
High (above 49)	5	5		
Total	100	100		

Data presented in Table 4.2 revealed that more than one-half of the respondent farmers (53percent) were under the low adopter category while 42% farmers belonged to medium adopter category. The remaining (5%) was found to be high adopter category. Data contained in the table 4.2 show that all the farmers adopted BRRI dhan 47, whether they were low, medium or high adopters. For many reasons farmers could not engage all the potential lands for BRRI dhan 47. Farmers of Bangladesh preaching integrated crop farming. In their small holdings they produce rice, wheat, potato, oil seeds, pulses, jute, vegetables and the more. So, reasonably majority of the farmers were low adopters of BRRI dhan 47. In such situation full use of innovation is not possible in Bangladesh. Moreover there are other promising innovations, which ensure farmers more economic benefit. So, farmers keep their same part of land for other technology as well. The farmers, who are low adopters in case of BRRI dhan 47, may be high for pulses or water melon. Bangladesh Rice Research Institute released BRRI dhan 47 rice variety in 2008. Still now this rice variety is not so popular in the study area. At seedlings stage and early mature stage of BRRI dhan 47 degree of salinity tolerant level is up to12 dsm[1] but at all these stages this variety do not tolerate higher salinity. Some other problems like natural calamities also have effect on adoption of BRRI dhan 47. Sometimes lack of awareness about new technology also effect on farmers' adoption.

4.3 Relationship between the selected characteristics of BRRI dhan 47 growing farmers and their adoption

Table 4.3 Coefficient of correlation showing relationship between BRRI dhan 47 farmers selected characteristics and their adoption of Salt tolerant variety BRRI dhan 47 (N= 100)

Independent variables	Dependent variable	Tabulated value 'r'		Coefficient of correlation
		0.5%	0.1%	(r value)
Age				-0.081^{NS}
Education				0.232^*
Family size				-0.023^{NS}
Farm size	Adoption of BRRI dhan 47			0.221^*
Annual family income	of selected characteristics	0.195	0.256	0.258^{**}
Organizational participation				0.144^{NS}
Innovativeness				0.220^*
Extension contact				0.279^{**}
Knowledge on rice cultivation				0.223^*

*= Significant at 0.05 level

**= Significant at 0.01 level

NS= Non significant

4.3.1 Age and adoption of Salt tolerant variety BRRI dhan 47

The relationship between age of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between age of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r'= -0.081, which led to the following observations:

> The relationship showed negative trend

> The computed value of 'r' (-0.081) was smaller than tabulated value (0.195) with 98 degrees freedom at 0.05 level of probability.

> Hence the concerned null hypothesis could not be rejected.

> The correlation co-efficient between the two concerned variables was not significant at 0.05% level of probability.

Based on the above findings, the researcher concluded that age of the farmers had no significant affect on adoption of BRRI dhan 47. This indicate that farmers of any age category – young, middle and old aged can adopt BRRI dhan 47.

4.3.2 Relationship between Education and adoption of Salt tolerant variety BRRI dhan 47

The relationship between age of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between Education of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (0.232*) which led to the following observations,

> The relationship showed a positive trend.

> The computed value of 'r' (0.232*) was larger than the tabulated value (0.195) with 98 degrees of freedom at 0.05 level of probability.

> Hence the concerned null hypothesis could be rejected.

➤ The correlation co-efficient between the two concerned variables was significant at 0.05% level of probability.

Based on the above findings, the researcher concludes that education of the farmers had a significant and positive affect with their adoption of BRRI dhan 47. This indicated that educational attainment of the farmers could influence their adoption behavior towards Salt tolerant variety BRRI dhan 47.

4.3.3 Family size and adoption of Salt tolerant variety BRRI dhan 47

The relationship between family size of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between family size of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (-0.023) which led to the following observations,

➤ The relationship showed negative trend.

➤ The computed value of 'r' (-0.023) was smaller than the tabulated value (0.195) with 98 degrees of freedom at 0.05 level of probability.

➤ Hence the concerned null hypothesis could not be rejected.

➤ The correlation co-efficient between the two concerned variables was not significant at 0.05% level of probability.

Based on the above findings, the researcher concludes that family size of the farmers had no significant affect with their adoption of BRRI dhan 47. It is state that small family has more ability to adopt new technologies than large family size. If the family sizes are big they suffered from financial inability though they not

4.3.4 Relationship between farm size and adoption of Salt tolerant variety BRRI dhan 47

The relationship between farm size of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between farm size of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (0.221*) which led to the following observations,

- The relationship showed a positive trend.
- The computed value of 'r' (0.221*) was larger than the tabulated value (0.195) with 98 degrees of freedom at 0.05 level of probability.
- Hence the concerned null hypothesis could be rejected.
- The correlation co-efficient between the two concerned variables was significant at 0.05% level of probability.

Based on the above findings, the researcher concludes that farm size of the farmers had a significant and positive affect with their adoption of BRRI dhan 47. The innovation has always risks. Sometime new technology used to fail in coping with new areas because of failure. The farmers having large farm size can take this risk as trial basis and if they fail they can compensate through other rice varieties. On the other hand, small farmers have no scope of taking risk for which they have to wait for a while in adopting new technology.

4.3.5 Relationship between annual family income and adoption of Salt tolerant variety BRRI dhan 47

The relationship between annual income of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between annual income of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (0.258**) which led to the following observations,

- ➢ The relationship showed a positive trend.
- ➢ The computed value of 'r' (0.258*) was larger than the tabulated value (0.256) with 98 degrees of freedom at 0.01% level of probability.
- ➢ Hence the concerned null hypothesis could be rejected.
- ➢ The correlation co-efficient between the two concerned variables was significant at 0.01% level of probability.

Based on the above findings, the researcher concludes that education of the farmers had a significant and positive effect with their adoption of BRRI dhan 47. This indicated that annual income of the farmers highly important. Therefore the farmers having more annual income could able to take risk of an extensive coverage. Those indicated that more annual income of the farmers increased a tendency on the way to more adoption of Salt tolerant variety BRRI dhan 47.

4.3.6 Organizational participation and adoption of Salt tolerant variety BRRI dhan 47

The relationship between organizational participation of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between organizational participation of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (0.144) which led to the following observations,

- The relationship showed a positive trend.

- The computed value of 'r' (0.144*) was smaller than the tabulated value (0.195) with 98 degrees of freedom at 0.05 level of probability.

- Hence the concerned null hypothesis could not be rejected.

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

Based on the above findings, the researcher concludes that organizational participation of the farmers had no significant affect with their adoption of BRRI dhan 47. This indicated that every farmer linked with organization or without participation can adopt BRRI dhan 47.

4.3.7. Relationship between innovativeness and adoption of Salt tolerant variety BRRI dhan 47

The relationship between innovativeness of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between innovativeness of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (0.220*) which led to the following observations,

- The relationship showed a positive trend.

- The computed value of 'r' (0.220*) was larger than the tabulated value (0.195) with 98 degrees of freedom at 0.05 level of probability.

- Hence the concerned null hypothesis could be rejected.

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

Based on the above findings, the researcher concludes that innovativeness of the farmers had a significant and positive affect with their adoption of BRRI dhan 47. This indicated that innovativeness of farmers could influence their adoption behavior towards BRRI dhan 47. Higher innovativeness is an individual inspires to adopt new technology. For This reason innovative farmers face less problems in adopting new agricultural practices.

4.3.8. Relationship between Extension media contact and adoption of Salt tolerant variety BRRI dhan 47

The relationship between extension contact of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between extension media contact of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (0.279**) which led to the following observations,

- ➤ The relationship showed a positive trend.
- ➤ The computed value of 'r' (0.279**) was larger than the tabulated value (0.256) with 98 degrees of freedom at 0.01% level of probability.
- ➤ Hence the concerned null hypothesis could be rejected.
- ➤ The correlation co-efficient between the two concerned variables was significant at 0.01% level of probability.

Based on the above findings, the researcher concludes that extension media contact of the farmers had significant affect with their adoption of BRRI dhan 47. This indicated that the farmer whose regularly conduct with extension worker, their

adoption rate of BRRI dhan 47 was higher than irregular contact with extension worker.

4.3.9. Relationship between knowledge on rice cultivation and adoption of Salt tolerant variety BRRI dhan 47

The relationship between knowledge on rice cultivation of the respondent farmers and their adoption of BRRI dhan 47 was examined by testing the following null hypothesis:

"There is no relationship between knowledge on rice cultivation of the respondent farmers and their adoption of BRRI dhan 47."

The table 4.3 shows the Co-efficient correlation between the concerned variables with computed value of 'r' = (0.223*) which led to the following observations,

> The relationship showed a positive trend.

> The computed value of 'r' (0.223*) was smaller than the tabulated value (0.195) with 98 degrees of freedom at 0.05 level of probability.

> Hence the concerned null hypothesis could be rejected.

> The correlation co-efficient between the two concerned variables was significant at 0.05% level of probability.

Based on the above findings, the researcher concludes that knowledge on rice cultivation of the farmers had significant effect with their adoption of BRRI dhan 47. This indicated that farmer's knowledge on rice cultivation increases the adoption of BRRI dhan 47 among the respondents.

4.4 Problems faced by the farmers in cultivation of BRRI dhan 47

The Problem Faced Index (PFI) was calculated to find out major problems faced by the farmers in adopting salt tolerant variety BRRI dhan 47 of cultivation.

Here,

PFI = 3×High Problem) + (2×Medium Problem) + (1×LowProblem) + (0×No

Problem)

The severity of problem faced of the farmers is shown in Table 4.4

Table.4.4: Problem Faced Index for selected 10 problems with rank order
Degree of problem (N= 100)

Sl. no	Nature of problem	Opinion at extent of problem				PFI	Rank order
		high	Medium	Low	Not at all		
1	Shattering problem on seedling stage	46	33	21	0	225	1st
2	Increasing cost on irrigation facilities	73	27	0	0	273	2nd
3	Unable to tolerate salinity at mature stage	22	48	30	0	192	8th
4	Lack rain or proper irrigation at tillering stage	20	64	16	0	218	4th
5	Losses due to natural calamities	82	18	0	0	282	3rd
6	Inadequate supply of inputs	20	49	31	0	189	9th
7	Lower yield than other popular varieties	17	38	36	9	163	10th
8	Less profitable than other crop cultivation	30	56	14	0	216	5th
9	Lack of proper land management techniques	30	38	32	0	198	7th
10	Unable to cope with higher level of salinity	16	70	14	0	202	6th

➢ "Shattering problem on seedling stage" was ranked first in Table 4.4 among
the problem faced in cultivating BRRI dhan 47. Shattering seedlings of
BRRI dhan 47 might be major hindrance in harvesting crop during boro
season.

- ➢ "Increasing cost on irrigation facilities" during cultivation of crop is another major problem and it ranked 2nd in Problem Faced Index. Price of fuel increase day by day. That's why increase cost on irrigation supply on the field as well as cost of production.

- ➢ "Losses due to natural calamities" is most important problem and it ranked 3rd in ranking order on the basis Problem Faced Index (PFI). Due to cold injury damage a lot on the field.

- ➢ "Lack of rain or proper irrigation at tillering stage" was ranked in 4th in Problem faced ranking order. At tillering stage BRRI dhan 47 are more sensitive to availability of water.

- ➢ "Less profitable than other crop cultivation" was ranked 5th in Problem Faced Index. Now a day farmer showed more interest on water melon cultivation because of its more profitable than rice cultivation.

- ➢ "Unable to cope with higher salinity" is also hindrance to adopt BRRI dhan 47 cultivation. This problem placed 6th in ranking order. Coastal areas are varying with rate of salinity. Highly saline soils are not suitable for this variety.

➤ "Lack of proper land management techniques" is needed to escape salinity and it ranked 7th in Problem Faced Index. Farmers are not aware about modern land management techniques which yield has been lower than general level.

➤ "Unable to tolerate salinity at mature stage" was ranked 8th in Problem Faced Index. BRRI dhan 47only able to tolerate salinity at seedling stage but at mature stage farmer faced problem during cultivation.

➤ "Inadequate supply of inputs" is the problem in rice cultivation which ranked 9th in Problem Faced Index. Lack of proper supply of seed fertilizer etc. as a result cannot fulfill farmers demand.

➤ "Lower yield than other popular varieties" was ranked 10th in ranking order of Problem faced. Some other variety released by BRRI gives more yield than BRRI dhan 47.

CHAPTER 5
SUMMARY

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

The adoption of BRRI dhan 47 among the coastal farmers depends upon on various facts including farmer's characteristics. A thoughtful understanding of the factors manipulating this adoption manner of the farmers is compulsory to study the adoption and diffusion process in the country. Therefore, the current study was carrying out in Subarnochar upazila under Noakhali District. Three villages named Khaser hat, Saheber hat and Char bata were selected to conducted study and the sample was 100 rice farmers were drawn from a population of 334. Data were gathered via a pretested interview schedule. Collected data decoded, compiled, tabulated and analyzed in harmonized with objectives of study. The study with the following specific objectives:

i)   To determine and describe the selected characteristics of farmers. The selected characteristics are: age, education, family size, farm size, annual income, organizational participation, innovativeness, extension contact and knowledge on rice cultivation.

ii)   To determine the extent of adoption of salt tolerant variety BRRI dhan 47 by the coastal farmers.

iii) To explore the relationship between the selected characteristics of the farmers and their adoption of salt tolerant variety BRRI dhan 47.

iv)   To describe the extent of problem faced by the farmers during cultivation of BRRI dhan 47.

5.1.1. The major findings of the study

According to the objectives of the study the findings are summarized as follows:

Selected characteristics of the farmers

Age of the farmers ranged for 29-65 years. The average being 39.70 with Standard deviation was 8.26. The highest proportion (48%) of the farmers was middle aged while 39% were young and 13% old. Majority (46 percent) of the farmers were under primary education. Secondary level education 32% while 19% has no education and 3% having above secondary education. Most of the farmers are in medium family size (60%) while small family 18% and 22% in large family size. The highest percentage (51%) of the farmers belonged to small farm size compared to 44% medium and 5% with large farm size as far as their farm size is concerned. The majority (66%) of the farmers have medium annual income compared to 13% under low annual income and 21% high annual income. The major proportion (65%) of the farmers had very low organizational participation contrast to 18% no participation and 17% has low participation .Maximum number of people (72%) was under low innovativeness compared to 20% has medium innovativeness while 8% has no innovativeness. Medium extension contact showed highest percentage (70%) compared to low extension contact which was 13% .High extension contact has been 23%.The highest proportion has medium knowledge on rice cultivation (70%). Low level of knowledge on rice cultivation was 17% while 13% has high level of knowledge.

5.1.2 Adoption of salt tolerant variety BRRI dhan 47

The feasible range of adoption of salt tolerant variety BRRI dhan 47 was 0- 100 while viewed ranges 6.67- 70.06. The mean adoption score was 27.67 and the standard deviation was 14.06. Highest percentage was under low adoption category (53%) compared to Medium adoption (42%) Only 5% was under high adoption.

5.2 Relationship of the selected characteristics of the farmers with their adoption of salt tolerant variety BRRI dhan 47

The null hypothesis accepted which founded of estimated 'r" value at 0.05% level of probability at 98 degrees of freedom. That's why Age, family size and organizational participation of the farmers and adoption of BRRI dhan 47 had no significant relationship. On the other hand, null hypothesis rejected on the basis of estimated 'r' value at 0.05% level of probability ai 98 degrees of freedom, so education, farm size, innovativeness and knowledge on the rice cultivation of the farmers has significant relationship with their adoption of BRRI dhan 47. On the other hand, annual family income and extension media contact more significant relationship because of null hypothesis rejected at 0.05% level of probability at 98 degrees of freedom.

5.3 Conclusions

Findings of the study and the sound analysis of their meaning in light of other related facts driven the examiner to draw the following conclusions:

➢ Findings of the study demonstrated a significant relationship of education with the adoption of BRRI dhan 47. Education is a causal factor of gaining knowledge and skill and has been formed affirmative

attitude in an individual near good possessions. There is a call for to develop the learning intensity of the farmers. It may, therefore be concluded that enrichment of non-formal education like extension to be made stronger among the farmers so that they form positive attitude towards the adoption of BRRI dhan 47.

➢ Farm size of the BRRI dhan 47 growers showed positive significant relationship with their adoption of salt tolerant variety BRRI dhan 47.The farmers having big farms are normally efficiently solvent and they are able to adopt new innovation.

➢ Annual income of BRRI dhan 47 growing farmers was vastly significant and positively associated with the adoption of BRRI dhan 47. High annual income of farmers keeps up higher economic and social status, and they were usually respected in the society. They have risk bearing capability and could assume a business enterprise if they are motivated. It may conclude that farmers having high income will be better position to get more adoption.

➢ Innovativeness of the farmers had a significant positive relationship with their adoption of BRRI dhan 47. They are having moderate innovativeness; they are able to adopt new technology. It can be bring to a close that innovativeness is a valuable factor for adoption of BRRI dhan 47.

➢ Extension media contact of the farmers had a positive significant relation with their adoption of salt tolerant variety BRRI dhan 47. It can be summarized that any effort to increase the extension contact of the

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farmers would be cooperative to increase the level of adoption of salt tolerant variety BRRI dhan 47.

➤ Knowledge on rice cultivation of the farmers had a significant positive relationship with their adoption. Having more knowledge an individual farmer becomes responsive of the recent information on the various aspects of salinity and salt tolerant variety. So, it can be accomplished that knowledge is a vital factor for greater adoption of salt tolerant variety BRRI dhan 47.

5.4 Recommendations

5.4.1 Recommendations for policy implications

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

➤ Education of the BRRI dhan 47 growers has significant relationship with their adoption. It indicates the importance of education to diffused modern innovation. For rising literacy level of farmers, establishment of adult school, night school and other related policy should be taken by apprehensive authorities.

➤ Farm size had positive significant relationship among the adoption of BRRI dhan 47. Most of the farmers are small to medium farm size so government should give subsidy and other facilities thus motivated small farmers to adopt new technology.

➤ The annual income had highly significant relationship with the farmers' adoption of BRRI dhan 47. It should be recommended that extension

service should provide satisfactory supervision and counseling to the farmers for increasing their farm income.

➤ Innovativeness had significant and positive correlation to the adoption BRRI dhan 47 technologies. To progress innovativeness of the farmers, useful course of action is needed. So, the system of diffusion of innovation should provide obligatory rules and regulation to get better innovativeness towards the BRRI dhan 47 of cultivation as well as other new ideas or practices.

➤ Extension media contact of the farmers in the study area has been established to be low to medium. But extension contact is key factor to adopt any innovation, so it is urged that extension workers should keep close link with the farmers.

➤ Knowledge on rice cultivation had significant positive relation with farmer's adoption of BRRI dhan 47. Extension worker, Go's NGO;s and other agriculture related organization are ought to acquire correct step to conscious about salinity and can give training to increase knowledge.

➤ In adopting BRRI dhan 47 cultivation farmers faced various problems. Natural calamities are most important problem among the various problems. BRRI scientist and other concerned authorities should take necessary step to mitigate these problems.

5.4.2 Recommendations for further study

A little bit of study as has been accomplished, cannot provide all the information for the suitable realization of the farmers in the direction of the

BRRI dhan 47 rice. Therefore the following recommendations were made for further study:

> The current study was performed in Subarnochar upazila under Noakhali district. It is recommended that related studies should be conducted other coastal areas of Bangladesh.

> This study explored only nine characteristics of farmers with their adoption headed for BRRI dhan 47 as a dependent variable. It is advised that further study be conducted other independent and dependent variables.

> In This study, farmer's age, family size and organizational participation has no significant relationship with their adoption. In This connection, further verification is necessary.

> Studies need to be carrying out to ascertain the principals and measures for establishment and preservation of nursing organization in the rural areas of Bangladesh.

> Research should also be undertaken to recognize the barrier factors on the way to adoption of BRRI dhan 47.

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(English Version of the Interview Schedule)

Department of Agricultural Extension and Information System

Sher-e-Bangla Agricultural University, Dhaka- 1207

Interview schedule on

Adoption of BRRI dhan 47 by the costal farmers of Noakhali Districts

Name of the farmers:...

Village: ....

Post Office: ....

Upazila: ....

Union: ....

District: ....

(Answer the following questions)

1. **Age:** .... years

2. **Educational qualification**
A. No education
B. Passed (if any class): ....

3. **Number of family member in your family**
   a. Male members----
   b. Female members----
   c. Total members-----

4. Farm size:

Sl.No	Type of land	Area	
		Local unit	Unit (ha)
01	Homestead (Including pond and garden)		
02	Own land under own cultivation		
03	Land taken from others on lease		
04	Land given to others on lease		
05	Land taken from others on *borga*		
06	Land given to others on *borga*		
07	Fallow land		
08	Total		

5. Annual income

Give particulars about your income from different sources the last one year

    i)   Service and other profession ....

    ii) From crops (vegetables, fish, field crops)...

    iii) From animal, poultry and fish...

    iv) From business..

    v) From other sources..

<div align="center">Total:</div>

6. Organizational participation

Name of the organization	No participation	Nature and duration of participation		
		Ordinary member (year)	Executive committee member (year)	Executive officer member (year)
Farmers co-operative society				
Youth either village club				

Mosjid/Temple committee				
NGO				
IPM/ICM club				
Irrigation committee				
Bazar committee				

7. Innovativeness

SI No	Name of technology	Adoption within 1-2 years	Adoption within 3-4 years	Within 5 years and above	Do not use
1	Use of modern agricultural technologies(power tiller/pump/seed driller)				
2	Use of Modern variety(crops & vegetables)				
3	Use of Granular Urea				
4	Use of Balanced fertilizer				
5	Use of IPM				
6	Use of Leaf color chart(LCC)				
7	Use of Bio-fertilizer				
8	Use of Green manure in Crop cultivation/Compost				
9	Use of poultry-fish culture				
10	Use of herbicide/weedicide				

8. The nature of Extension contact

Name of the Media	Regularly	Oftenly	Occasionally	Rarely	No conduct at all
a) Conduct with SAAO	10 or more times/month	6-9 times/month	3-5 times/month	1-2 times/month	No visit
b) Conduct with AEO/AO	5 or more times/month	4 times/month	2-3 times/month	1 time/month	No visit
c)Participate in Agricultural training	5 or more times/year	3 times/year	2 times/year	1 time/year	No visit
d)Conduct with NGO officer	10 or more times/year	7-9 times/year	4-5 times/year	1-3 time/year	No visit
e) Attend Agricultural group meeting	15 or more times/year	10-14 times/year	5-9 times/year	1-4 time/year	No visit
f)Watching Agriculture related TV Program	4 or more times/year	3 times/year	2 times/year	1 time/year	No visit
g)Reading news, bulletin, leaflet about Agriculture	5 or more times/year	3-4 times/year	2 times/year	1 time/year	No visit
h)visit in agricultural fair	4 or more times/year	3 times/year	2 times/year	1 time/year	No visit
i)Conduct with seed & fertilizer dealer	10-12 time/year	7-9 times/year	3-6 times/year	1-2 times/year	No visit
j)Group Discussion	10-12 time/year	6-9 times/year	3-5 times/year	1-2 times/year	No visit

9. Knowledge on rice cultivation:

SI No.	Questions	Weighted Score	Obtained Score
1	Mention the name of four rice varieties?	2	
2	How many seedlings do you transplant per hill in rice for rice cultivation?	2	
3	How would you improve of your soil?	2	
4	What is the importance of water on rice field?	2	
5	Name four common fertilizers available at your local market during rice seasons.	2	
6	What are the characteristics of good seed?	2	
7	Mention the name of two organic manures	2	
8	Mention four important diseases of rice	2	
9	Mention two major harmful insects of rice	2	
10	What are the deficiency symptoms of TSP fertilizer?	2	
11	Name two green manuring crops	2	
12	Name two beneficial pests	2	
13	What is IPM?	2	
14	What do you mean by balanced fertilizer?	2	
15	Do you have any idea of split fertilizer?	2	

10. Adoption of Salt tolerant variety BRRI dhan 47 in last years

Total suitable cultivated area for BRRI dhan 47(p)	Actual area used for BRRI dhan 47 cultivation (e)	e/p

11. Problems faced on BRRI dhan 47 Cultivation:

SI.No.	Problems	Extent of problem			
		High	Medium	Low	Not at all
1	Shattering problem on seedling stage				
2	Increasing cost on irrigation facilities				
3	Unable to tolerate salinity at mature stage				
4	Lack of rain or irrigation at tillering stage				
5	Losses due to natural calamities				
6	Inadequate supply of inputs				
7	Lower yield than other high yielding varieties				
8	Less profitable than other crop cultivation.				
9	Lack of proper land management techniques				
10	Unable to cope with higher salinity				

Thank you for your cooperation

Signature of Interviewer-----------   Date:

Appendix-B
Correlation Matrix
N= 100

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	Y
X_1	1									
X_2	0.269**	1								
X_3	0.342**	-0.073^{NS}	1							
X_4	0.187^{NS}	0.215*	0.298**	1						
X_5	0.202*	0.267**	0.415**	0.752**	1					
X_6	0.321**	0.119^{NS}	0.187	0.454**	0.374**	1				
X_7	0.133^{NS}	0.437**	0.175	0.473**	0.287**	0.274**	1			
X_8	0.167^{NS}	0.282**	0.162	0.289**	0.238*	0.202*	0.474**	1		
X_9	0.155^{NS}	0.382**	0.123^{NS}	0.248*	0.187^{NS}	0.193^{NS}	0.363**	0.435**	1	
Y	-0.081^{NS}	0.232*	0.023^{NS}	0.221*	0.258**	0.144^{NS}	0.220*	0.279**	0.223*	1

^{NS} Non significant

*Significant at 0.05% level of probability (Table value = 0.195)

**Significant at 0.01% level of probability (Table Value= 0.254)

X1= Age

X2= Education

X3= Family size

X4= Farm size

X5= Annual income

X6= Organizational participation

X7= Innovativeness

X8= Extension contact

X9= knowledge on rice cultivation

Y= Adoption of BRRI dhan 47