ADOPTION OF HIGH YEILDING WINTER VEGETABLE VARIETIES BY FARMERS

BY

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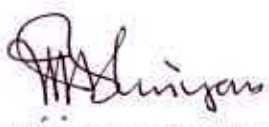

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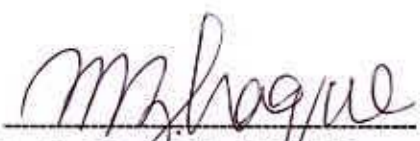

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CERTIFICATE

This is to certify that the thesis entitled, "Adoption of high yielding winter vegetable varieties by the farmers of Kalaroa upazila under Satkhira district" submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE in AGRICULTURAL EXTENSION embodies the result of a piece of bonafide research work carried out by Md. Rofiqul Islam, Registration No.00710 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.

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Dhaka, Bangladesh

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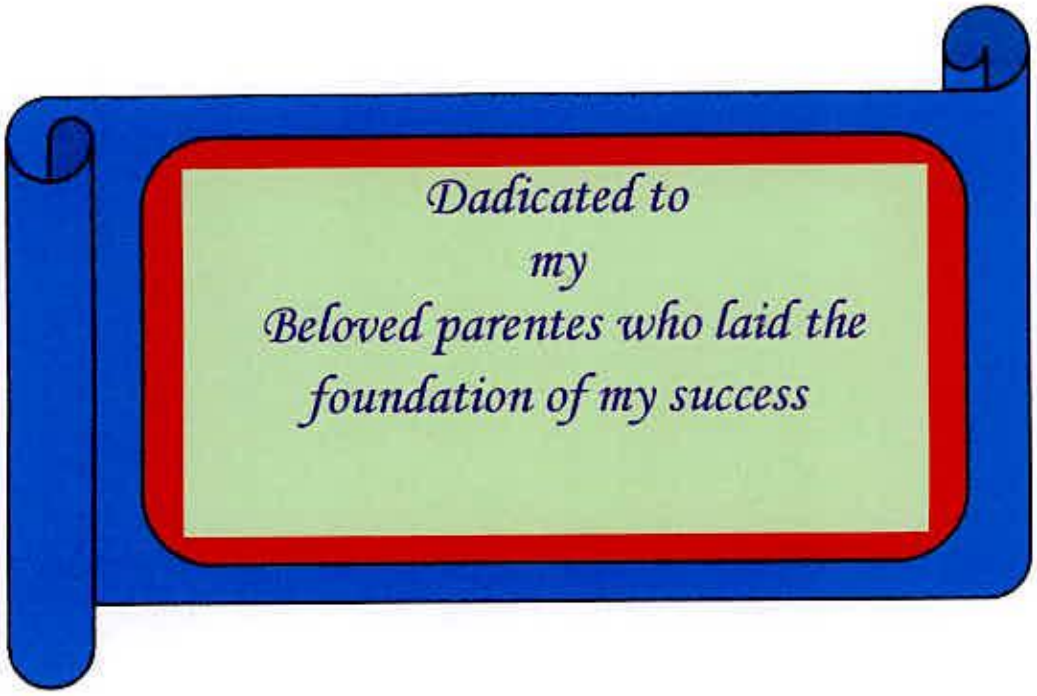
Dadicated to
my
Beloved parentes who laid the
foundation of my success

ACKNOWLEDGEMENT

All praises due to Almighty and the much merciful Allah who created everything of the universe and enabled the researcher to complete this piece of research work. During the tenure of this research work many personnel helped, guided and cooperated the author. The author is immensely grateful to all of them, although it is not possible to mention every one by name. But some of their help and cooperation loom so large that they must be mentioned.

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The author

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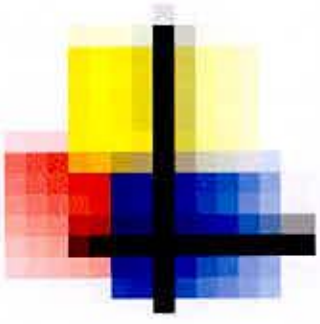
ADOPTION OF HIGH YIELDING WINTER VEGETABLE VARIETIES BY THE FARMERS OF KALAROA UPAZILA UNDER SATKHIRA DISTRICT

ABSTRACT

The major purpose of the study was to find out the extent of adoption of high yielding winter vegetable varieties by the growers in some selected areas of Satkhira district. Attempts were also made to describe some of the selected characteristics of the vegetable growers and their relationship with their adoption of high yielding winter vegetable varieties. One hundred (100) growers were selected randomly from a total of 670 growers under two Unions of Kalaroa Upazila of Satkhira district. An interview schedule was used for collection of data, which took 30 days during 20 July to 19 August 2007. The findings of the study indicate that (51 percent) of the growers had medium adoption while 27 percent had low adoption and 22 percent had high adoption of high yielding winter vegetable varieties. Correlation analyses indicate that among the selected characteristics, age, education, farm size, annual family income, cosmopoliteness and extension media contact showed significant relationship with their adoption of high yielding winter vegetable varieties. On the other hand, family size, organizational participation and innovativeness of the growers did not show any significant relationship with their adoption of high yielding winter vegetable varieties.



CHAPTER I

INTRODUCTION

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1.1 Background

Bangladesh is predominantly an agro-based country with an area of 147570 sq. km. About 76.61 percent of its population lives in rural areas and two-third of her labor forces (68.6 percent) are engaged in agriculture (BBS, 2006). The country produces different type of crops and vegetables. Cultivation of vegetables is an important part for the farmers because these are rich source in minerals, vitamins and essential amino acids.

Vegetables are considered as one of the most important groups of food crop due to their high nutritive value, labor-intensive production, relatively higher yield and higher return. These are considered as a cheaper source of natural supplementary food and can be grown within short duration. Being labor intensive, vegetable production creates opportunities for employment. In Bangladesh half of the population are under the poverty line and suffer from various health problems. Severity of malnutrition and iron deficiency is the highest among females of all age groups and children.

Being a poor nation the farmers of Bangladesh can not afford to overcome such a big malnutrition problem by eating fish, meat, egg, butter, ghee etc. As a matter of fact, the vegetables can play a very important role to improve the nutritional level in the country which is almost entirely overlooked. In other words, we can easily overcome the curse of malnutrition problem by eating adequate quantity of

vegetables, which require some adjustment in the dietary habit and also by increasing per acre yield of vegetable.

The above mentioned discussion simply indicates the importance of vegetable in our daily life from nutritional point of view. From the economic point of view we should cultivate vegetables for higher farm income, increasing cropping intensity, improvement of socio –economic condition, development of healthy and efficient manpower, checking import and extension of industrialization, employment generation and less consumption of cereals, which leads to overcome food shortage.

Our present situation of vegetable production shows that we are producing 14.73 lakh M. tons of vegetable in about 1.43 lakh hectares of land against the total cultivable land of 8.67 million hectare (BBS 2005). This production is not sufficient to meet the minimum daily requirement of 200 gm / person / day, vegetables for the population. Hence a massive effort is required to bridge the wide gap between supply and demand. On the other hand, the forgoing discussion suggests that to meet the food shortage and to get other economic benefit like earning foreign currency through export, the only alternative is to increase per hectare yield of vegetable production.

Vegetables are broadly classified into two groups namely summer vegetables and winter vegetables among which the coverage of winter vegetable is the highest (70 %), which is favored by suitable climate. To increase per hectare yield, among all other improved technologies required, the cultivation of high yielding winter vegetable varieties is first and foremost one. Sound planning and execution of programmes should be aimed at helping people to grow more vegetables. There is a great scope for increasing the production of vegetable during the winter season where considerable amount of land remain fallow.

In order to do this, one needs to know the extent to which the high yielding vegetable varieties are being grown at present. Farmer's characteristics might also have influence on it. There might be some problem in cultivating winter vegetables. Such considerations indicate the need for understanding research studies on the various aspects of the cultivation of high yielding winter vegetable varieties.

The present study of adoption is the only one piece of a complex puzzle, but the findings of this study can be a key in extending the adoption of high yielding winter vegetable varieties in the country. This will be helpful for planning adoptive research, formulating extension messages and production plans. This will help to understand the picture of high yielding winter vegetable varieties adopted by the farmers of Kalaroa area in particular. With this end in view, the author became keenly interested to investigate the characteristics of the farmers related to adoption of high yielding winter vegetable varieties by the farmers of Kalaroa upazila under Satkhira district.

1.2 Statement of the Research Problem

The researcher noticed that, farmers cultivated vegetable without asking their varietals identity. Farmers purchased the seedlings available in the open market without judging their quality and variety. They collected seed from local sales centers without raising question of labeling on the packets. There were numerous varieties of vegetables grown in the winter season, among which more than 30 have been developed, recommended and released by BARI, BINA, DAE and other organizations. Recognized sales centers generally import different varieties. Now the question, to what extent farmers used high yielding varieties? Farmer's receptivity to different agricultural innovations varies, depending on their

characteristics, attributes of innovations and social system variables (Ramgowda and Siddramaiah 1987).

Any person who is experienced in programs of change is aware that some innovations become popular soon, some very slowly and some in spite of great quantum of push provided by agencies and change agents do not meet wide scale adoption (Haque 1993). This experience is common in promotion of change in any area of human behavior particularly in the field of agriculture. This is the high time for seeking answers of the following questions:

- What are the characteristics of the growers that influence them adoption of high yielding winter vegetable varieties?
- To what extent farmers are cultivating high yielding varieties of vegetables in the winter season?
- Are there any relationships between the extent of adoption of high yielding winter vegetable varieties and selected characteristics of the farmers?

On the basis of above question and discussion, with a view to examine the relationship between the selected characteristics of farmers with their adoption of high yielding winter vegetable varieties, the researcher undertook an investigation entitled "Adoption of High Yielding Winter Vegetable Varieties by the Farmers of Kalaroa Upazila under Satkhira District". The answers of the above mentioned questions and related search helped the study toward an appropriate direction.

1.3 Objectives of the Study

The following specific objectives were set forth in order to give proper direction of the study.

1. To determine and describe the selected characteristics of the winter vegetable growers,
2. To determine the extent of adoption of high yielding winter vegetable varieties by the farmers and
3. To explore the relationships of the selected characteristics of the vegetable growers with their extent of adoption of high yielding winter vegetable varieties.

1.4 Scope and limitations of the Study

The purpose of the study was to have an understanding of the extent of adoption of high yielding winter vegetable varieties by the growers. However, from the research point of view, it was necessary to impose certain limitations as follows:

1. The study was confined to Kalaroa upazila of Satkhira district.
2. Characteristics of the vegetable growers are many and varied but only nine were selected for investigation in this study. This is done to complete the study within limited resources and time.
3. Population for the present study was kept confined within the heads of the winter vegetable growing farm families. Because they were the major decision makers and knowledgeable family members in the adoption of high yielding winter vegetable varieties.
4. The investigator applied the situation prevailing during the year 2006-2007 (collected facts and figures).

5. For information about the study the researcher depended on the data as furnished by the selected vegetable growers during their interview with him.

The findings of the study will be especially applicable to Kalaroa upazila area. However, the findings will also have the implications for other areas of the country having similarities with the study area. Thus the findings are expected to be useful to the extension workers and planners for preparation of programs for rapid adoption of high yielding winter vegetable varieties by the farmers. The findings may also be helpful to the field workers to improve their technique and strategy of action for effective working method with the rural people to generate rural employment and to improve rural economy.

1.5 Assumptions of the Study

"An assumption is the supposition that an apparent fact or principle is true in light of the available evidence" (Good, 1945). The researcher had the following assumptions in mind while undertaking this study.

1. The respondents included in the sample for this study were competent enough to furnish proper responses to the queries made in the interview schedule.
2. The researcher who acted as interviewer was adjusted to social and environmental conditions of the study area. Hence, the data collected by him from the respondents were free from bias.
3. The responses furnishes by the respondents were reliable. They expressed the truth about their convictions and opinions.

4. Views and opinions furnished by vegetable growers included in the sample were representative views and opinions of the whole population of the study area.
5. The findings of the study will have general application to other parts of the country with similar personal, socio-economic and cultural condition of study area.

1.6 Hypotheses of the Study

As defined by Good and Hatt (1953) "A hypothesis is a proposition, which can be put to a test to determine the validity". It may seem contrary to or in accord with common sense. It may prove to be correct or incorrect.

In any event, however, it leads to empirical test. Hypothesis may be broadly divided into two categories, namely, research hypothesis and null hypothesis. In studying relationship between variables, an investigator first formulates research hypothesis which states anticipated relationships between the variables. However, for statistical test it becomes necessary to formulate null hypothesis. A null hypothesis states that there is no relationship between the concerned variables.

The following null hypothesis was formulated to explore the relationships of the selected characteristics of the growers with their adoption of high yielding winter vegetable varieties.

"There are no relationships between the selected characteristics of the growers and their adoption of high yielding winter vegetable varieties".

1.7 Definition of the Terms

Certain key terms used throughout the study are defined in this section for clarity of understanding.

Vegetables: The term vegetables, referred to the edible parts of plants (root, stem, leaf, fruit, head, curd / flower etc.) which are eaten as cooked food or green salad.

Winter Vegetables: The vegetables grown during October to March in Bangladesh are termed as winter vegetables. In this study, four selected HYV winter vegetables were considered.

High Yielding Variety: A high yielding variety is one which posses the quality for better performance in respect of yields, insect and disease resistance. In this study those varieties were taken whose yield ranged from 20-80 ton / ha.

Adoption of High Yielding Winter Vegetable Varieties: This term referred to ones decision to continue the cultivation of High Yielding Winter Vegetable Varieties.

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

Age: Age of an individual farmer was defined as the period of time in years from his birth to the time of interview.

Education: Level of education of an individual farmer was defined as the formal education received up to a certain level from an educational institute (e.g. school, college and university) at the time of interview.

Family size: Family size of farmer was defined as the number of individuals in his family including himself, his wife, children and other dependent members who live in the same homestead area and eat in the same kitchen.

Farm size: Farm size refers to the area of land possess by a farmer through different land tenure system such as own land under own cultivation, land given other as borga, land taken from other as borga, land taken as lease etc. Hectare was used as unit of farm size.

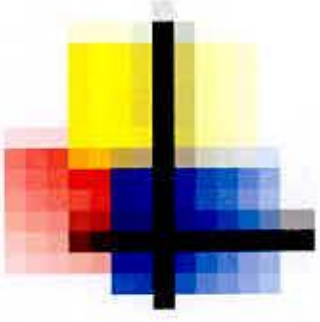
Annual family income: Annual income refers to the total earning of a respondent by himself and the members of his family from agriculture and non agriculture (services, business etc.) sources during last year. It was expressed in Taka.

Cosmopolitenesss: Cosmopoliteness is the degree to which an individual respondent how frequent visits, travels to the places external to his own social system for the purpose of achieving new experience, new knowledge related to his farm business.

Organizational participation: Organizational participation is referred to the degree to which a farmer takes part in different social organizations either as an ordinary member, executive committee member or executive officer within a specified year.

Extension media contact: The term extension media contact refers to an individual's exposure to or contact with different communication media, source and personalities being used for dissemination of new technologies among the farmers.

Innovativeness: The term innovativeness refers to the degree to which an individual is relatively earlier in adopting new ideas than the other members of a social system (Rogers 1983). Innovativeness of a respondent was measured on the basis of year of adoption of nine technologies related to high yielding winter vegetable varieties.



CHAPTER II

REVIEW OF LITERATURE

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REVIEW OF LITERATURE

The researcher made an elaborate search of available literature for the research. Available literature was extensively reviewed to find out work in Bangladesh as well as abroad. The reviews are conveniently presented passed on the major objectives of the study. This chapter is divided into three major sections. The first section deals with the farmers' adoption of innovation. The second section deals with the relationships between farmers' characteristics and adoption of innovation. . The third section deals with the conceptual framework of the study.

2.1 Review of Literature on General Context of Adoption

Islam and Mahboob (1973) studied the adoption of potato, Japanese radish and watermelon in primary agricultural co-operative societies of Comijlla Kotwali thana. They found that 51 percent had medium level or high level adoption of potato cultivation. The extent of adoption of Japanese radish was comparatively low than that of potato.

Sobhan (1975) studied on the extent of adoption of winter vegetables namely, tomato, radish, lettuce and potato in Boilor union of Mymensingh district. Overall winter vegetable adoption scores of the farmers could range from 0 to 140. Overall adoption scores indicated that the percent of the farmers did not adopt 27 winter vegetables cultivation while 48 percent had low adoption and 25 percent high adoption.

Gogoi and Gogoi (1983) conducted a study on adoption of recommended plant protection practices in rice varieties in Jorhat district of Asam state in India. The recommended practices were seed selection, seed treatment, growing of tolerant or resistant variety, prophylactic measures and chemical protection measures. The study revealed that among the respondent 5 percent had low-level low adoption, 36.36 percent had medium level of adoption and 13.64 percent had high level of adoption of recommended plant protection practices.

Hossain (1983) studied on the extent of adoption of HYV rice as transplanted aman and other related aspect in Bhabakhali union of Mymensingh district. He observed that among the respondent farmers, 54 eprcent had high adoption of HYV rice and 46 percent had medium adoption of HYV rice as transplanted aman.

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

Remy- J (1987) made an investigation on technical innovation and social relationships, the case of vegetable production in Roussillion. The study based on a survey on the adoption of hydroponics, especially in tomato production, in the region of roussion, France, since 1977. The study revealed that, hydroponics has until now been operated by people with a specific social identify. Vegetable

producers who are young frequently graduate and who come from traditional gardening families are practicing this technique.

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

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

Fernadez- cornejo, Beach and Huang (1994) studied on the adoption of IPM techniques by vegetable growers in Florida, Michigan and Texas. The study revealed that, farmers who adopted IPM tended to be less risk averse and used more managerial time on farm activities than non adopters. Adopters were also more likely to operate large, irrigated farms and use more family labor. Location factors and the type of crop grown were also influential in IPM adoption.

Podder (1999) concluded a research study on the adoption of Mehersasgar banana by the farmers. He found 47 percent of the respondents had medium adoption compared to 14 percent having low and 39 percent having high adoption.

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

2.2 Relationship between Farmers' Characteristics and Adoption of Innovation

2.2.1 Age and adoption of Innovation

Sobhan (1975) conducted a study on adoption of winter vegetable verities by the farmers. He observed that there was no relationship between the age of the marginal farmers and their adoption of winter vegetable.

Islam (1993) conducted a study on adoption of improved potato practices by the farmers. He also found that there was no relationship between the age of the farmers and adoption of winter vegetables.

Mutaleb (1995) observed that there was a positive and significant relationship between age and adoption of winter vegetables.

Hussen (2001) conducted a study, which concluded that age of the sugarcane growers had a significant negative relationship with their adoption of modern sugarcane cultivation practices.

Rahman (2001) observed that there was no significant relationship between age and adoption of Aalok-6201 hybrid rice cultivation practices. Podder (1999) and Hossain (1999) have found similar results in their respective studies.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandip. He found that age of the farmers was not related to their adoption of modern agricultural technologies.

2.2.2 Education and adoption of innovation

Islam (1993) conducted a study on adoption of improved potato practices by the farmers. He found that there was a positive and significant relationship between the education of the farmers and adoption of winter vegetables. Similar findings were observed by Mutaleb (1995).

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

Sarker (1997) found that the level of education of the farmers had a positive and significant relationship with the adoption of improved potato cultivation practices. Halim (1985), Barkatullah (1985), Islam (1993), Haque (1993), Basher (1993), Pal (1995) and Chowdhury (1997) observed similar findings.

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

Islam (2003) conducted a study on adoption of organic manures. He found that there was a positive and significant relationship between education of the farmers and adoption of organic manures.

2.2.3 Family size and adoption of innovation

Islam (1993) conducted a study on adoption of improved potato practices by the farmers. He found that there was no relationship between the family size of the farmers and adoption of winter vegetables.

Mutaleb (1995) conducted a study on adoption of improved potato technologies by the farmers. He observed that there was a positive and significant relationship between family size and adoption of winter vegetables.

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

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 family size of the farmers had no significant relationship with their adoption of Aalok-6201 hybrid rice.

2.2.4 Farm size and adoption of innovations

Haque (1993) conducted a research study on adoption of improved practices in sugarcane cultivation by the sugarcane growers of Sreepur thana under Gazipur

district. His study revealed that farm size had a negative significant relationship with the adoption of improved practices in sugarcane cultivation.

Islam (1993) conducted a study on adoption of improved potato practices by the farmers. He found that there was a positive and significant relationship between the farm size of the farmers and adoption of winter vegetables. Similar findings were observed by Mutaleb (1995).

Hussen (2001) conducted an investigation on adoption of modern sugarcane cultivation practices by the farmers of Dewangonj upazila in Jamalpur district. He observed that there was a significant positive relationship between farm size of the farmers and 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 size of the farms had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

2.2.5 Annual family income and adoption of innovation

Hossain (1991) conducted a research study on the adoption behavior of contact wheat growers. In the study, he found that there was no relationship between the income of contact growers and the adoption on improved farm practices in wheat cultivation. Beal and Sibley (1967) found the similar finding in their study.

Hoque (1993) in his study found a negative relationship between annual income of the growers and their adoption on improved practices in sugarcane cultivation.

Mutaleb (1995) conducted a study on adoption of improved potato technologies by the farmers. He observed that there was a positive and significant relationship between annual family income and adoption of winter vegetables.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandip. He observed that he annual income of the farmers had no relationship with their adoption of modern agricultural technologies.

2.2.6 Cosmopoliteness and adoption of innovation

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

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

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandip. He found that cosmopoliteness of the farmers had significantly positive relationship with their adoption of modern agricultural technologies.

2.2.7 Organizational participation and adoption of innovation

Islam (1993) conducted a study on adoption of improved potato practices by the farmers. He found that there was a positive significant relationship between organizational participation of the farmers and adoption of winter vegetables.

Mutaleb (1995) conducted a study on adoption of improved potato technologies by the farmers. He observed that there was no relationship between organizational participation and adoption of winter vegetables.

Podder (1999) conducted a study on the adoption of Methersagar banana cultivation by the farmers of Gazaria union under Sahkipur thana of Tangail district. He found a significant postive relationship between credit availability and adoption of Mehersagar banana.

2.2.8 Extension media contact and adoption of innovation

Saxena *et. al.*(1990) conducted a study on adoption of rainfed wheat technologies by the farmers of India. He found that extension contact of the growers had positive relationship with their adoption of rainfed wheat technologies.

Islam (1993) conducted a study on adoption of improved potato practices by the farmers. He found that there was a positive and significant relationship between the extension contact of the farmers and adoption of winter vegetables. Similar findings were observed by Mutaleb (1995).

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

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandip. He found that extension media contact of the farmers had no significant relationship with their adoption of modern agricultural technologies.

2.2.9 Innovativeness and adoption of innovation

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

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

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

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

Rahman (2003) found that the innovativeness of the farmers had no significant relationship with their adoption of modern rice varieties.

2.3 Conceptual Framework of the Study

The present study will attempt to focus two concepts; first the farmer's selected characteristics and the second, their adoption of high yielding winter vegetable varieties. Adoption of high yielding winter vegetable varieties of an individual may be influenced and affected through interacting forces in his surrounding.

Adoption of high yielding winter vegetable varieties of individual farmer may also be influenced by these personal, economic, social and physiological characteristics. In this study, farmer's nine characteristics have only been taken into consideration. Moreover, it is quite impossible to deal with all the characteristics. Selected characteristics are: age, education, family size, farm size, annual family income, cosmopoliteness, organizational participation, extension media contact and innovativeness. These nine characteristics are the independent variables of this study, while adoption of high yielding winter vegetable varieties being the main focus of the study constituted the only dependent variable. A simple conceptual framework in this connection has been given below:

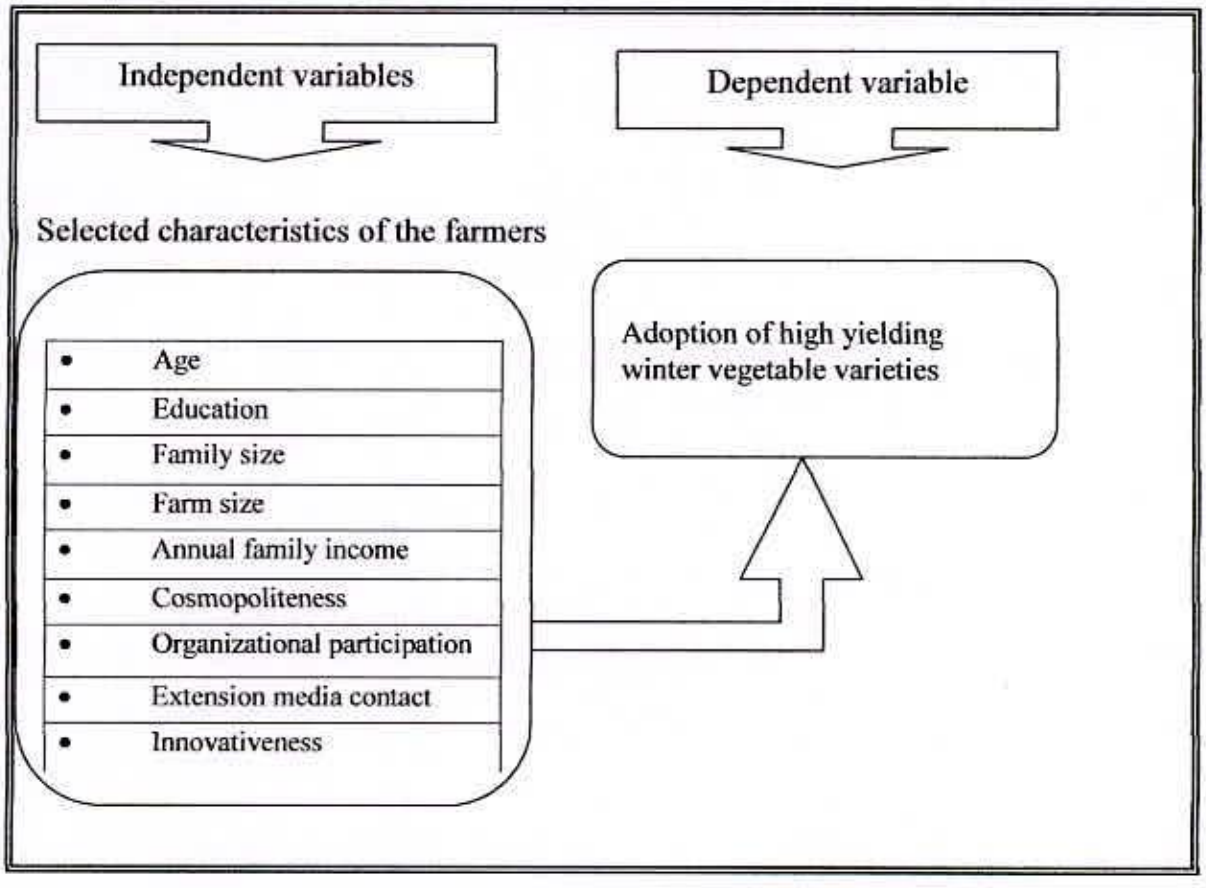
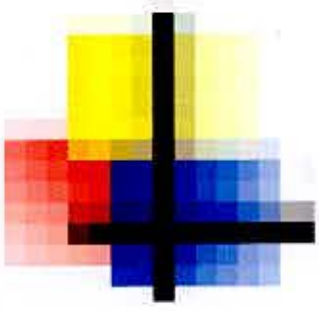


Figure 2.1 Conceptual framework of the Study



CHAPTER III

METHODOLOGY

Chapter III

METHODOLOGY

Methodology refers to the methods and procedures in the research work. For any scientific investigation methods and procedures are very important and require a very careful consideration. The researcher was very much careful for using proper methods in all aspects of the investigation. The methods and procedures used in conducting this research are presented below:

3.1 Locale of the Study

Considering the vegetable growing area, the study was conducted in four villages namely Darki, Hizaldi, Madra and Kamorpur in Chandanpur and Sonabaria unions of Kalaroa upazila under Satkhira district. In kalaroa upazila there were 13 unions. Chandanpur and Sonabaria are two of them. The Kalaroa upazila stands on an area of about 233 km^2. Chandanpur and Sonabaria unions are well communicated from upazila headquarter. Vegetables are important crops of the farmers of these two unions. The map of Satkhira district showing Kalaroa Upazila and a map of Kalaroa Upazila showing the study area have been shown in the Fig. 3.1 and 3.2.

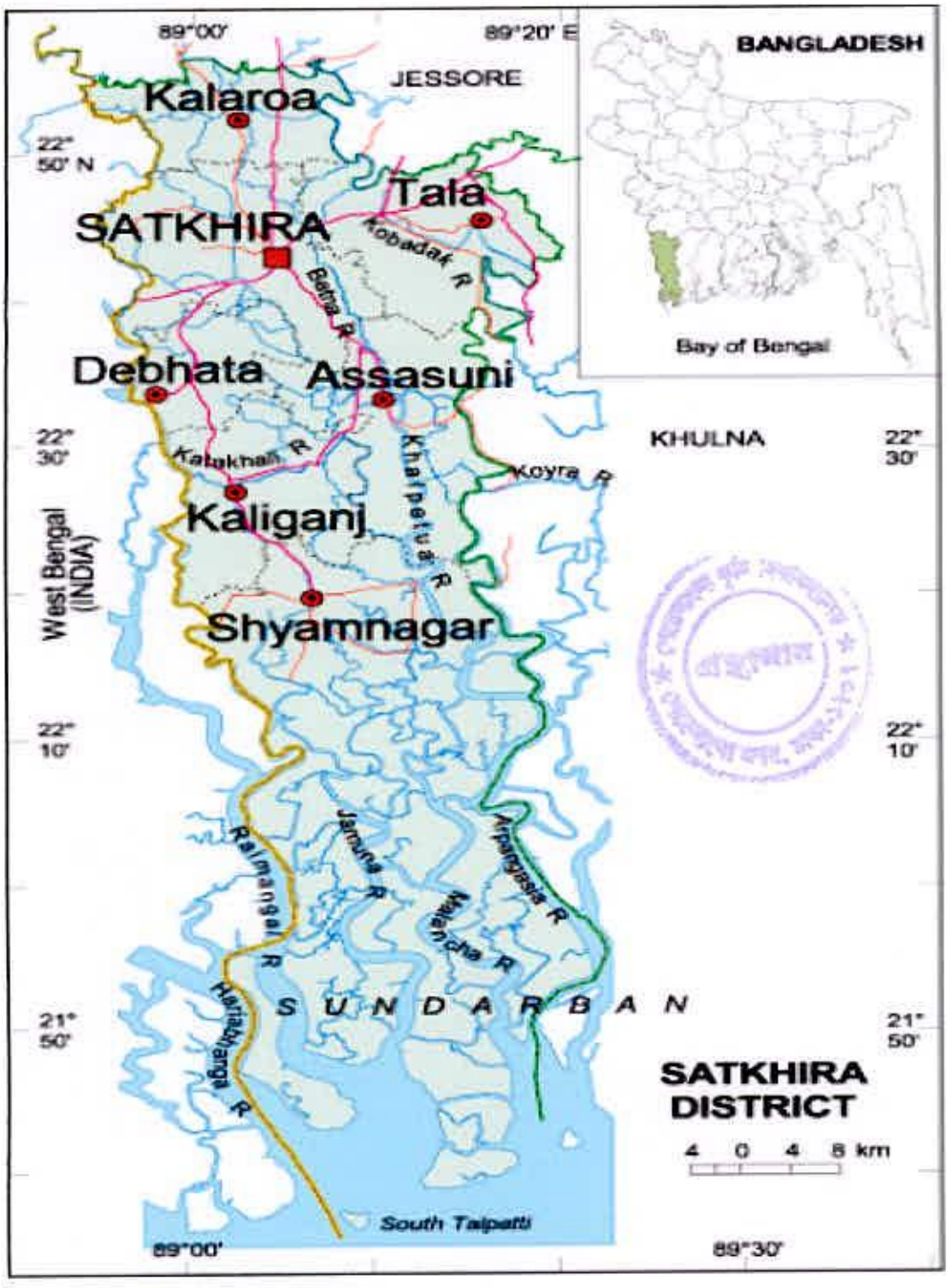
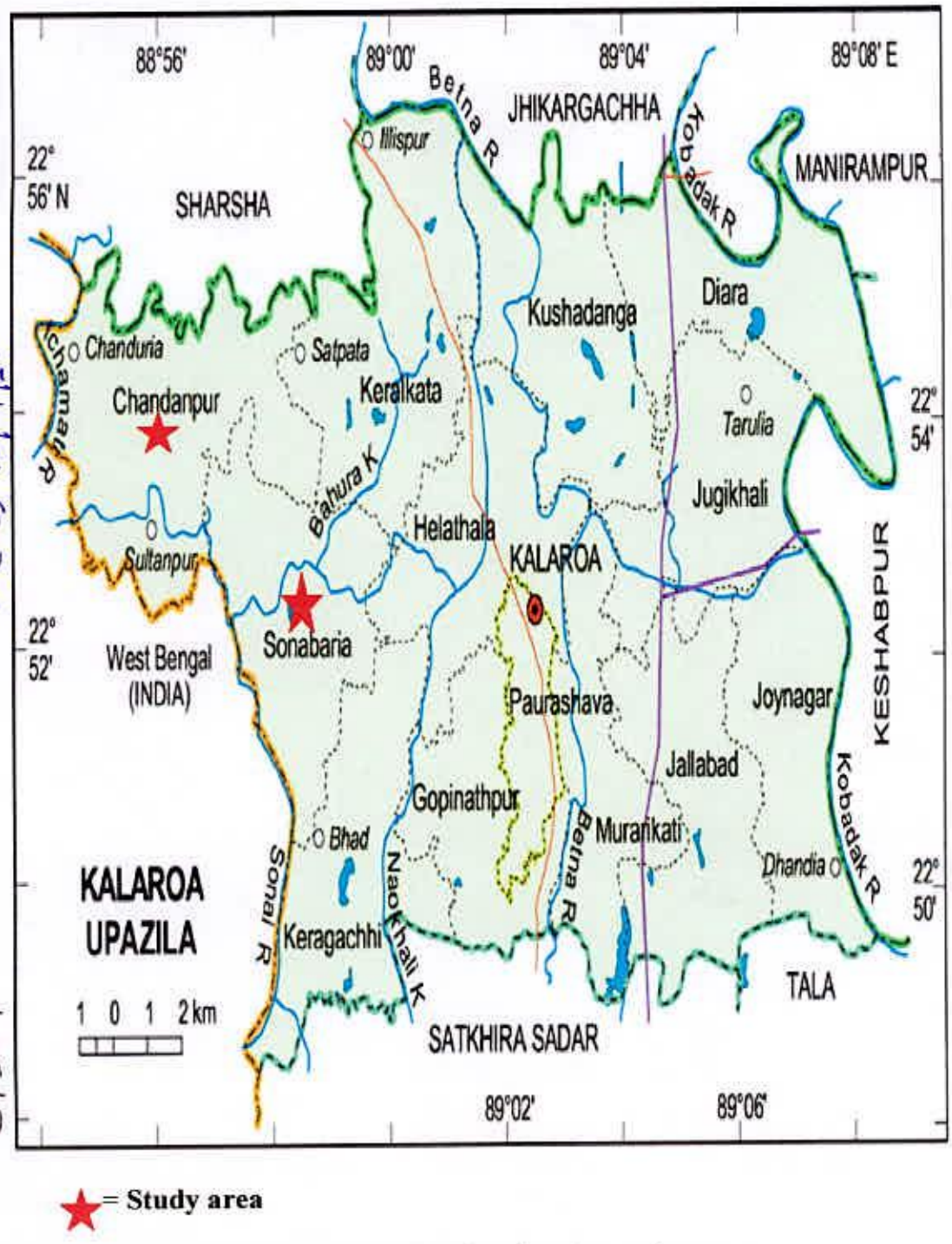


Fig. 3.1 A map of Satkhira district showing Kalaroa Upazila.



= Study area

Fig. 3.2 A map of Kalaroa Upazila showing the study area.

3.2 Population and Sampling Design

Four villages namely Darki, Hizaldi, Madra and Kamorpur in Chandanpur and Sonabaria unions of Kalaroa upazila under Satkhira district was selected randomly for the study. Then an update list of all vegetable growers of the selected villages was prepared with the help of Sub-Assistant Agricultural Officer (SAAO). The list comprised a total of 670 farmers' constituting the population of this study. Fifteen percent (15 %) of the population was randomly selected as sample of population by using Random sampling method. Thus, the total sample size of the study area was 100 vegetable growers.

In addition to that, two percent of the population was selected randomly and proportionately of the selected villages to make a reserve list. Thus, the additional sample, so drawn stood 13 farmers, which were included in the reserve list. In case the individuals included in the original sample were not available at the time of data collection, the farmers from the reserve list were used for the purpose. The distribution of the farmers included in the population, sample and those in the reserve list appears in Table 3.2.

Table 3.2 Distribution of vegetable growers constituting the population, sample and reserve list

Name of the unions	Name of the villages	Number of vegetable growers	Number of Sample	Number of reserve list
Chandanpur	Darki	216	32	4
	Hizaldi	182	27	4
Sonabaria	Madra	168	25	3
	Kamorpur	104	16	2
	Total	670	100	13

3.3 Variables of the Study

In a descriptive social research, selection and measurement of the variables is an important task. In this connection, the researcher reviewed literature as far as possible to widen his understanding about the nature and scope of the variables relevant to his research. A variable is any measurable characteristic which can assume varying or different values in successive individual Cases (Ezekiel and Fox 1959). The hypothesis of a research, when constructed properly contains at least two important elements, viz. an independent variable and a dependent variable. An independent variable is that factor which is manipulated by the experimenter in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the experimenter introduces, removes or varies the independent variable (Townsend, 1953). The dependent variable is often called the 'criterion' or 'predicted variable' where as the independent variables are called treatment, experimental or antecedent variable.

3.4 Independent Variables

The selected individual characteristics of the vegetable growers were the independent variables for this study, namely, age, education, family size, farm size, annual family income, cosmopoliteness, organizational participation, extension media contact and innovativeness.

3.4.1 Measurement of independent variables

The measurement of the independent variables is also an important task as well as their selection. In accordance with the objectives it was necessary to measure the nine selected independent variables.

3.4.1.1 Age

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

3.4.1.2 Education

Education was measured as the ability of an individual vegetable grower to read and write or formal education received up to a certain standard. Education of a respondent was measured on the basis of classes he has who passed in formal educational institution. For example, if a respondent passes class 5, his education score was 5. If a respondent did not know how to read and write his education score was taken as zero '0'. A score of 0.5 was given to that respondent who could only sign his name. If a respondent passed the SSC examination, his educational score was given as 10.

3.4.1.3 Family size

Family size of a respondent was determined in terms of actual number of members in his family including himself, his wife, sons, daughters, brothers, sisters, parents and any other person who jointly lived and ate together at the time of interview. The scoring was done by the actual number as mentioned by the respondent. For example, if a respondent had five (5) members in his family then the family size score would be five (5). This variable appears item no. 3 in the interview schedule as presented in Appendix-A.

3.4.1.4 Farm size

Farm size of the respondent was measured as the size of his farm (including rice and other crops) on which he continued his farm practices during the period of study. Each respondent was asked to mention the homestead area, the area of land under his own cultivation, own land given to others on borga (share cropping) system, land taken from others on borga system, land given to others on lease

system, land taken from others on lease system, own pond, own garden and miscellaneous fallow land. The area was estimated in terms of full benefit to the farmers or his family. The following formula was used in measuring the farm size:

Farm size= $A_1 + A_2 + 1/2(A_3+A_4) + A_5+A_6+A_7+A_8$

Where,

A_1 = homestead area

A_2= Own land under own cultivation

A_3= Own land given to others on share cropping system

A_4= Land taken from others on share cropping system

A_5= land taken from others on lease system

A_6= Own pond

A_7= Own garden

A_8= Miscellaneous fallow land.

The unit of measurement was hectares.

N. B In share cropping the landowner of selected four villages get half of the total production.

3.4.1.5 Annual family income

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

1. In the first phase, the yield of the entire crop in the previous year was noted, and then the entire yield was converted into cash income according to the prevailing market price.
2. In the second phase, the cash income by selling cattle heads, milk and milk products, poultry and its products, fisheries etc. according to prevailing market price.

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

*** Total annual family income = A+B+C**

Where,

A =Annual income from agricultural crops

B = Annual income from livestock, poultry & fisheries

C = Annual income from service, business & labor

3.4.1.6 Cosmopoliteness

Cosmopoliteness refers to the degree to which a respondent's orientation is external to his own social system. Cosmopoliteness of a respondent was measured in terms of his nature of visits to the seven different types of places as shown in item number 6 in the interview schedule. The cosmopoliteness was measured by assigning score 3 for regular visit, 2 for occasional visit, 1 for rarely visit and 0 for not at all. The cosmopoliteness score of the respondents could range from 0 to 21, where 0 indicating no cosmopoliteness and 21 indicating very high cosmopoliteness.

3.4.1.7 Organizational participation

Organizational participation of a respondent was measured by his membership in different organizations for a particular period of time. This was measured by participation of a respondent in an organization. For participation, weight was assigned as 0, 1, 2 and 3 for no participation, general member, executive member and executive officer respectively. Then these scores were multiplied by number

of years, the respondent participated in the respective organization. If a respondent is a general member of a cooperative society, executive member of a social committee and executive officer of a sports club for subsequent two years, his score of the organizational participation would be: 1x2+2x2+3x2= 12

3.4.1.8 Extension contact

Extension contact may be defined as one's extent of exposure to different extension teaching methods. The extent of contact was determined against four (4) point rating scales as Not at all, Rarely, Occasionally and frequently score was assigned as 0, 1, 2 and 3 respectively. For all the 12 selected extension contact, it has been described as follows:

Extent of contact	Assigned score
Not at all	0
Rarely	1
Occasionally	2
Frequently	3

The extension contact of a respondent was, therefore, determined by adding the total responses against 12 selected extension personnel. The extension contact score could range from 0 to 36, where 0 indicating no extension contact and 36 indicating very high contact.

3.4.1.9 Innovativeness

Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in a social system (Rogers; 1995). In this study, innovativeness of a respondent was measured on the basis of the earlier or later adoption of 9 improved agricultural practices. The scores were assigned on the

basis of time required by an individual to adopt each of the practices in the following manner:

Period of adoption	Assigned score
Within One year after hearing	3
Within Two to three years after hearing	2
Above three years after hearing	1
Not at all	0

Innovativeness score of a respondent farmer was obtained by adding his scores for adoption of all the 9 selected improved agricultural practices. Innovativeness score of a respondent farmer could range from 0 to 27, where, 0 indicating no innovativeness and 27 indicating very high innovativeness.

3.5 Measurement of dependent variable

Adoption of high yielding winter vegetable variety was the dependent variable of this study. The procedure followed in measuring the dependent variable is presented below:

Adoption of high yielding winter vegetable varieties

Adoption of high yielding winter vegetable varieties was measured by computing Adoption Quotient (AQ). It was calculated by asking the farmers i) area used for the technology ii) potential area for the technology iii) number of technologies and iv) years of technology use. Here varieties are considered as technologies. Adoption of high yielding winter vegetable varieties was measured by Adoption Quotient as the following formula suggested by Bhuiyan (2005):

$$AQ = \frac{\sum u/p}{y \times n} \times 100$$

Where,

u = Used area

p = Potential area

y = Years of technology (variety) use

n = Number of technologies

Using above formula, adoption of High Yielding Winter Vegetable Varieties score of a respondent could range from 0-100, while 0 indicating no adoption and 100 indicating highest adoption

3.6 Statement of the Hypothesis

In order to guide relevant data collection, analysis and interpretation of data, a set of hypothesis would be formulated for empirical testing. As defined by Goode and Hatt (1952), "Hypothesis is a proposition which can be put to test to determine its validity. It may seem contrary to, in accord with common sense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test." In broad sense, hypothesis may be divided into two categories, namely, research hypothesis (H_1) and null hypothesis (H_2). In studying relationships between variables an investigator first formulates research hypothesis which states anticipated relationships between the variables. On the other hand, for statistical test, it becomes necessary to formulate null hypothesis. A null hypothesis states that there is no relationship between the concerned variables. The following null hypothesis would be formulated to explore the relationship of the selected characteristics of the growers with their adoption of high yielding winter vegetable

varieties, "There is no relationship between the selected characteristics of the growers and their adoption of high yielding winter vegetable variety".

3.7 Instrument for Collecting of Data

In order to collect relevant information an interview schedule was carefully designed keeping the objectives of the study in mind. The interview schedule was designed in Bangla to ensure easy communication between the researcher and the respondent. The interview schedule initially prepared was pre-tested by administering the same to ten Vegetable growers of the study area. The pre-test was helpful to identify faulty questions and statements in the draft schedule. Necessary additions, corrections alterations and adjustments were made in the schedule on the basis of the pre-test experience. The schedule was multiplied in its final form for the collection of data. An English version of the interview schedule has been presented in the Appendix A. The Bangla version of the interview schedule was used during final data collection.

3.8 Collection of Data

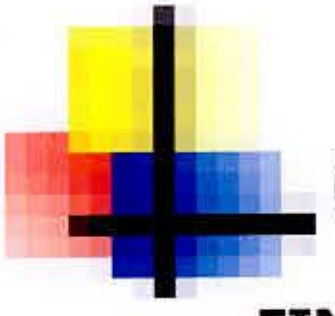
The researcher himself collected data from the vegetable growers by using the interview schedule. The interviews were conducted individually in the houses of the respondents during their leisure period. Only ten vegetable growers of the original list were not available during interview and hence ten vegetable growers were replaced from the reserve list. Prior information was given to the respondents before going to them for interviewing. The researcher took all possible care to establish rapport with then. While any respondent faced difficulty in understanding any question, the researcher took utmost care to explain the issue. He obtained excellent cooperation from the respondents and others concerned during the time of interview. The entire process of collecting data took 30 days from July 20 to August 19, 2007.

3.9 Data Processing

A detail coding plan was prepared. Data were coded into a coding sheet. These were then compiled, analyzed in accordance with the objectives of the study. Qualitative data were converted into quantitative form by means of suitable scoring techniques for the purpose of analysis.

3.10 Statistical Analysis

After completion of data collection the responses were coded, tabulated and analyzed according to the objectives of the study. Local units of measurement were converted in to standard units. The responses to the questions in interview schedule were transferred to a master sheet to facilitate tabulation. The analysis was performed using statistical treatment with SPSS computer package programme (Statistical Package for Social Sciences).



CHAPTER IV

FINDINGS AND DISCUSSION

Chapter IV

RESULTS AND DISCUSSION

In this Chapter, the findings of the study and the interpretations of their meaning are presented. These are conveniently presented in three sections in accordance with the objectives of the study. In the first section the selected characteristics of the vegetable growers have been discussed. The second section deals with grower's adoption of high yielding vegetable varieties. The third section deals with the relationships between vegetable growers' selected characteristics and their adoption of high yielding winter vegetable varieties have been discussed.

4.1 Section I: Selected Characteristics of the Vegetable Growers

Behavior of an individual is determined to a large extent by his personal characteristics. The characteristics of an individual are an important factor in developing mental make up for making decisions about various issues of livelihood. More particularly decisions related to farming activities are being influenced largely by different characteristics of an individual. The characteristics of the growers were selected to find out their relationship with the adoption of high yielding winter vegetable varieties. The selected characteristics included their age, education, family size, farm size, annual income, cosmopoliteness, organizational participation, extension media contact and innovativeness. These characteristics of the growers have been described in this section.

4.1.1. Age

Age of the farmers was determined by the number of years from his birth to the time of interview. It was found that the age of the respondents ranged from 22 to 67 years, the average being 42.35 years and the standard deviation was 11.61. 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). Table 4.1.1 contains the distribution of the respondents according to their age.

Data presented in Table 4.1.1 indicated that the highest proportion (48 percent) of the respondents fell in the middle-aged category compared to 28 percent young and 24 percent old aged category. It was also revealed that three fourth (76 percent) of the respondents comprised of either young or middle-aged categories. Bashar (1993), Hossen (2001) and Islam (2002) also found the similar findings in their studies.

Table 4.1.1 Distribution of the respondents according to their age

Category	Frequency	Percent	Observed range	Mean	Standard deviation
Young aged (up to 35)	28	28			
Middle aged (36-50)	48	48	22-67	42.35	11.61
Old aged (above 50)	24	24			
Total	100	100			

Conclusion can be drawn that young and middle-aged farmers are generally receptive to new ideas and things. They have a favorable attitude towards trying of new ideas. However, the older farmers because of their longer farm experience might have valuable opinions regard to adoption of high yielding winter vegetable varieties.

4.1.2 Education

Education of a respondent was measured by the level of his formal education i. e. highest grade (class) passed by him. The education score of the respondents

ranged from 0 to 14, the average being 6.04 and the standard deviation was 3.44. Based on their level of education, the respondents were grouped into four categories, "no education" (0), "primary education" (1-5), "secondary education" (6-10), and above secondary education" (above 10).

Data presented in Table 4.1.2 indicate that a large proportion (48 percent) of the respondents fell under category of "primary education" compared to 44 percent "secondary education", 7 percent "above secondary education" and only 1 percent having "no education".

Table 4.1.2 Distribution of the farmers according to the their education

Categories	Frequency	percent	Observed range	Mean	Standard deviation
No education (0)	1	1			
Primary education (1-5)	48	48			
Secondary education (6-10)	44	44	0-14	6.04	3.44
Above secondary education (above 10)	7	7			
Total	100	100			

The above picture of education of study area is highly satisfiable as compared to national average literacy. All most all the respondents were literate. One should be wondered if there is low adoption of high yielding winter vegetable varieties in study area.

4.1.3 Family size

The family size of the farmers ranged from 3 to 12 members, the average being 6.04 with a standard deviation 2.43. On the basis of their family size, the respondents were classified into three categories: "small family" (up to 5

members), "medium family" (6-8 members) and "large family" (above 8). Table 4.1.3 shows the distribution of the respondents according to their family size.

Data presented in Table 4.1.3 indicate that the large proportion (50 percent) of the respondents belonged to the "small family" category compared to 29 percent belonged to "medium family" category and 21 percent to "large family" category.

Table 4.1.3 Distribution of the farmers according to their family size

Category	Frequency	percent	Observed range	Mean	Standard deviation
Small family (up to 5)	50	50			
Medium family (6 to 8)	29	29	3-12	6.04	2.43
Large family (above 8)	21	21			
Total	100	100			

This finding indicates that more than three fourth (79 percent) of the respondents had either small or medium family size. The data also indicate that the average family size (6.04 people) of the respondents of the study area was about equal with the national average of 5.2 (BBS, 2006). This may be due to the consciousness of proper adoption of family planning measures in the study area.

4.1.4 Farm size

Farm size was measured on the basis of the cultivated area either owned by a farmer or cultivated on share cropping system, the area being estimated in terms of full benefit to the farmers. The farm size varied from 0.16 to 2.17 hectares. The average farm size was 0.74 hectares with a standard deviation of 0.38. Based on their farm size, the respondents were classified into three categories, "small farm"

(up to 0.50 ha), "medium farm" (.51-1.0 ha), and "large farm" (above 1 ha). The distribution of the respondents according to their farm size shown in Table 4.1.4

Data presented in the Table 4.1.4 show that the highest proportion (44 percent) of the farmers had medium farm compared to 35 percent had small farm and 21 percent having large farm. It may also be revealed that 79 percent of the respondents comprised of either small or medium farm.

Table 4.1.4 Distribution of the farmers according to their farm size

Categories	Frequency	percent	Observed range	Mean	Standard deviation
Small farm (up to .50 ha)	35	35			
Medium farm (.51 to 1 ha)	44	44	0.16-2.17	0.74	0.38
Large farm (above 1 ha)	21	21			
Total	100	100			

The average farm size of the respondent farmers was 0.74 hectares, which is smaller than the national average (0.81 hectares). The Government extension agencies and Non- Government Organization (NGO) should pay attention to initiate programme for small and medium farm holders on priority basis because those two categories were combined the major section of the farmers in the study area.

4.1.5 Annual family income

Annual family income was estimated on the basis of total receipt of money, goods and services during a year and expressed in taka. Annual income of the respondent ranged from TK.12 thousand to TK. 96 thousand. The average annual income was

TK 27.67 thousand and standard deviation 20.76. On the basis of annual income, the respondents were classified into three categories: "Very low income" (up to TK. 24 thousand), "Low income" (TK. 24.1 to 50 thousand) and "Medium income" (above 50 thousand). The distribution of the respondents according to their annual income is shown in Table 4.1.5

Data shown in Table 4.1.5 revealed that highest proportion (54 percent) of the respondents had Low annual income compared to 28 percent having very low and 18 percent under medium annual income.

4.1.5 Distribution of the respondents according to their annual family income

Category	Frequency	percent	Observe range	Mean	Standard Deviation
Very low income (up to 24000)	28	28			
Low income (24001-50000)	54	54	12000-96000	27670	20761
Medium income (above 50000)	18	18			
Total	100	100			

The average annual family income of the farmers of the study area was less and none of the farmer was found high income. This might be due to the fact that the farmers of the study area were engaged in agriculture only. They also not earn from other sources such as service, business etc.

4.1.6 Cosmopoliteness

Cosmopoliteness scores of the respondents ranged from 6 to 18 against the possible range of 0 to 21 with an average 10.50 and standard deviation of 3.21. On the basis of their cosmopoliteness scores, the respondents were classified into three categories: "low cosmopoliteness" (up to 9), "medium cosmopoliteness" (10 to 14), and "high cosmopoliteness" (above 14). The distribution of the respondents according to their cosmopoliteness is shown in Table 4.1.6

Data contained in Table 4.1.6 indicate that the highest proportions (48 percent) of the respondents were "low cosmopoliteness", while 35 percent of them being "medium cosmopoliteness", and only 17 percent under "high cosmopoliteness".

Table 4.1.6 Distribution of the respondents according to their cosmopoliteness

Categories	Frequency	percent	Observe range	Mean	Standard deviation
Low cosmopoliteness (up to 9)	48	48			
Medium cosmopoliteness (10 to 14)	35	35	6-18	10.50	3.21
High cosmopoliteness (above 14)	17	17			
Total	100	100			

Data also revealed that majority (83 percent) of the respondents were low to medium in terms of their cosmopoliteness. It may be concluded that all the respondents of the study area had the cosmopoliteness.

4.1.7 Organizational participation

Organizational participation scores of the respondents were computed on the basis of the extent of participation in different organizations. Organizational participation of the respondents ranged from 0 to 17. The average was 3.26 with a standard deviation 3.28. On the basis of organizational participation, the farmers were classified into four categories: "no participation" (o), "low participation" (1to 4), "medium participation" (5 to 8) and "high participation" (above 8).

Data presented in the Table 4.1.7 show that half (50 percent) of the respondents had low participation in organizations which was highest. A mentionable number (22 percent) having no organizational participation, while 21 percent had medium and only 7 percent of the respondent had high organizational participation.

Table 4.1.7 Distribution of the respondents according to their organizational participation

Category	Frequency	percent	Observed range	Mean	Standard Deviation
No participation (0)	22	22			
Low participation (1 to 4)	50	50			
Medium participation (5 to 8)	21	21	0-17	3.26	3.28
High participation (above 8)	7	7			
Total	100	100			

The findings indicate that about three fourth of the farmers (72 percent) had almost no or low participation. Ahmed (1974) also found 89 percent of the farmers had either no participation or low participation. So, GO and NGO should come forward for the socio-economic development of the study area.

4.1.8 Extension media contact

Extension contact scores of the farmers were computed on the basis of their extent of contact with 12 sources of extension information. To compute extension media contact scores of the respondents ranged from 5 to 33 with an average 21.24 and the standard deviation of 9.10 against the possible range of 0 to 36. On the basis of extension media contact scores, the respondents were classified into three categories: "low extension contact" (up to 10), "medium extension contact" (11 to 25) and "high extension contact" (above 25). The distribution of the respondent according to their extension media contact is shown in Table 4.1.8

Table 4.1.8 Distribution of the respondents according to their extension media contact

Categories	Frequency	percent	Observed range	Mean	Standard deviation
Low contact (up to 10)	19	19			
Medium contact (11 to 25)	38	38	5-33	21.24	9.10
High contact (above 25)	43	43			
Total	100	100			

Data presented in Table 4.1.8 indicate that the highest proportion (43 percent) farmers of the study area had high extension media contact, while 38 percent had medium extension media contact and 19 percent had low extension media contact.

The findings of the study indicate that most of the respondents (81 percent) had medium to high extension media contact with various information sources for getting necessary agricultural information. It may also be concluded that all the respondents of the study area had the extension media contact.

4.1.9 Innovativeness

Innovativeness scores of the respondents were computed on the basis of their extent use of new ideas. The maximum innovativeness score of the respondents was 20 and the minimum was 2 against the possible range of 0 to 27. However, the average was 10.53 and the standard deviation 4.37. Based on their innovativeness scores, the respondents were classified into three categories: "very low innovativeness" (up to 6), "low innovativeness" (7 to 12) and medium innovativeness (above 12). The distribution of the respondents according to their innovativeness is shown in Table 4.1.9

Data contained in Table 4.1.9 indicate that the highest proportion (51 percent) of the farmers had low innovativeness as compared to 29 percent medium innovativeness and 20 percent had very low innovativeness.

Table 4.1.9 Distribution of the respondents according to their innovativeness

Categories	Frequency	percent	Observed range	Mean	Standard deviation
Very low innovative (up to 6)	20	20			
Low innovative (7 to 12)	51	51	2-20	10.53	4.37
Medium innovative (above12)	29	29			
Total	100	100			

Data also revealed that majority (80 percent) of the respondents of the study area had low to medium level of innovativeness. It may be concluded that all the respondents of the study area had the innovativeness. These two results would help the extension planners to chalk out future extension programme for transfer of new ideas to the potential farmers.

4.2 Section II: Adoption of high yielding winter vegetable varieties

There were many varieties in winter vegetable production but in this study only four important varieties were taken into consideration for determining adoption of high yielding winter vegetable varieties. The four varieties were:

1. Diamond (Potato).
2. Manik (Tomato)
3. Tasakisan (Raddish)
4. Uttara (Brinjal)

The adoption score of these four varieties (technologies) ranged from 26.0 – 80.0 against the possible range of 0-100. The average adoption was 44.78 with a standard deviation of 12.84. Based on the adoption score, the farmers were classified into three categories as shown in Table 4.2

Table 4.2 Distribution of the growers according to their adoption of high yielding winter vegetable varieties

Categories of adoption	Vegetable growers		Mean	Standard deviation
	Number	Percentage		
Low adoption (up to 33)	27	27	44.78	12.84
Medium adoption (34-66)	51	51		
High adoption (above 66)	22	22		
Total	100	100		

Findings revealed that the highest proportion (51 percent) of the farmers fell under the medium adopter's category, while 27 percent had low adopters and only 22 percent had high adopters. Thus, an overwhelming majority (73 percent) of the farmers had medium to high adoption. For clarity of understanding a bar graph was presented in figure 3.

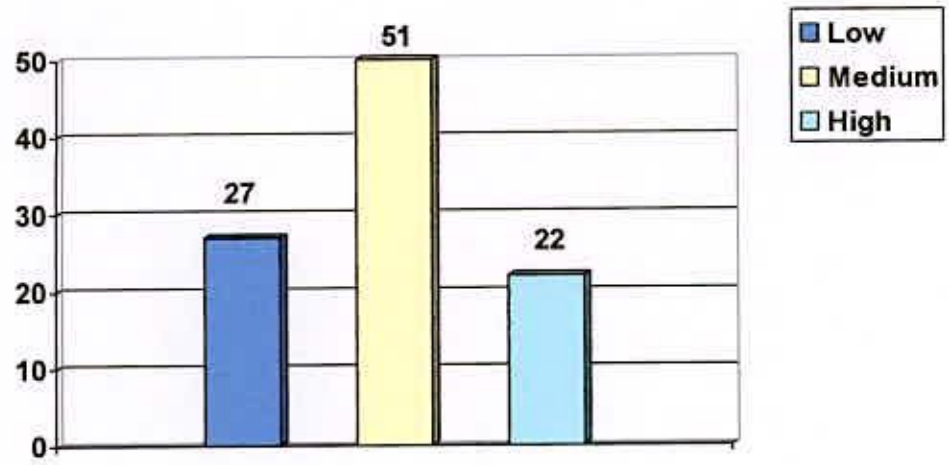


Figure 4.2 Farmers overall adoption of high yielding winter vegetable varieties

4.3 Section III: Relationships between the selected characteristics of the farmers and their adoption of high yielding winter vegetable varieties

This section deals with the relationships with nine selected characteristics of the farmers and their adoption of high yielding winter vegetable varieties. The selected characteristics constituted independent variables and the adoption of high yielding winter vegetable varieties by the farmers considered as dependent variable. Pearson's product moment correlation co-efficient "r" has been used to test the hypothesis concerning the relationship between two variables. Five percent level of significance was used as the basis for acceptance or rejection of any null hypothesis.

The summary of the results of the correlations co-efficient relationships between the selected characteristics of the respondents and their adoption of high yielding winter vegetable varieties is shown in Table 4.3.1

Table 4.3.1 Co-efficient of correlation of the selected characteristics of the farmers and their adoption of high yielding winter vegetable varieties

Dependent variable	Independent variables	Computed value of "r"	Table value of "r" at 98 degree of freedom	
			0.05%	0.01%
Adoption of high yielding winter vegetable varieties	Age	-0.275**	0.196	0.257
	Education	0.383**		
	Family size	-0.173^{NS}		
	Farm size	0.207*		
	Annual family income	0.211*		
	Cosmopoliteness	0.216*		
	Organizational participation	0.063^{NS}		
	Extension media contact	0.201*		
	Innovativeness	0.169^{NS}		

NS = Non significant

*= Significant at 0.05 level of probability

** = Significant at 0.01 level of probability Organizational participation

4.3.1 Relationship between age of the farmers and their adoption of high yielding winter vegetable varieties

In order to determine the relationship between age of the farmers and their adoption of high yielding winter vegetable varieties, the following null hypothesis was tested:

"There was no relationship between age of the farmers and their adoption of high yielding winter vegetable varieties."

The co-efficient of correlation between the concerned variables was computed and found to be -0.275 as shown in table 4.3.1 which led to the following observation regarding the relationship between the two variables under consideration:

a) The relationship between the two variables was found to be negative.
b) The computed value of "r" (r= +0.275) was found to be greater than the table value (r= 0.257) with 98 degrees of freedom at 0.01 level of probability.
c) The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.
d) The null hypothesis could be rejected.

The findings imply that the age of the farmers had a significant and negative relationship with their adoption of high yielding winter vegetable varieties. This meant the young aged farmers were more interested to adoption of high yielding winter vegetable varieties than the older farmers because they have more risk taking ability than the old aged farmers.

4.3.2 Relationship between education of the farmers and their adoption of high yielding winter vegetable varieties

The relationship between education of the farmers and their adoption of high yielding winter vegetable varieties, the following null hypothesis was tested:

"There was no relationship between education of the farmers and their adoption of high yielding winter vegetable varieties."

Computed value of the co-efficient of correlation between the education of the farmers and their adoption of high yielding winter vegetable varieties was found to

be +0.383 as shown in Table 4.3.1. The following observations were recorded regarding the relationships between the two variables on the basis of the co-efficient of correlation:

a) The relationship showed a positive trend between the concerned two variables.
b) The computed value of "r" (r= +0.383) was found to be greater than table value (r = 0.257) with 98 degrees of freedom at 0.01 level of probability.
c) The co-efficient of correlation between the concerned variables was significant at 0.01 level of probability.
d) The concerned null hypothesis was rejected.

The findings indicate that education of the farmers had a significant and positive relationship with their adoption of high yielding winter vegetable varieties. Similar findings were also observed by Hamid (1995), Khan (1995) and Hoque (1993). Education enables individuals to gain knowledge and thus increase their power of understandings. Consequently, their out look is broadened and horizon of knowledge is expanded. Thus, adoption of high yielding winter vegetable varieties was higher of those farmers who had higher education.

4.3.3 Relationship between family size of the farmers and their adoption of high yielding winter vegetable varieties

In order to the relationship between family size of the farmers and their adoption of high yielding winter vegetable varieties, the following null hypothesis was tested:

"There was no relationship between family size of the farmers and their adoption of high yielding winter vegetable varieties."

The co-efficient of correlation between the concerned variables was found to be -0.173 as shown in Table 4.3.1. This led to the following observations regarding the relationship between the two variables under consideration:

a) The relationship showed a tendency in the negative direction between the concerned variables.
b) The computed value of "r" (r= -0.173) was smaller than the table value (r= 0.196) with 98 degrees of freedom at 0.05 level of probability.
c) The co-efficient of correlation between the concerned variable was not significant at 0.05 level of probability.
d) The null hypothesis could not be rejected.

The finding demonstrates that the family size of the farmers had no significant and negative relationship with their adoption of high yielding winter vegetable varieties. This study indicates that adoption of high yielding winter vegetable verities significantly not increased with increased family size. Pal (1995), Hossain (1999), Hussen (2001) and Rahman (2001) observed also similar findings.

4.3.4 Relationship between farm size of the farmers and their adoption of high yielding winter vegetable varieties

In order to the relationship between farm size of the farmers and their adoption of high yielding winter vegetable varieties, the following null hypothesis was tested: "There was no relationship between farm size of the farmers and their adoption of high yielding winter vegetable varieties."

The calculated value of the correlation co-efficient between the two mentioned variables was found to be +0.207 as shown in Table 4.3.1. This led to the

following observations regarding the relationship between the two variables under consideration:

a) A positive trend was observed between the two variables.
b) The computed value of "r" (r= +0.207) was larger than the table value (r=0.196) with 98 degrees of freedom at 0.05 level of probability.
c) The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.
d) The null hypothesis was rejected.

From the above observations, it might be concluded that there was significant positive relationship between farm size of the farmers and their adoption of high yielding winter vegetable varieties. The finding is quite rational, because adoption of high yielding winter vegetable varieties is relatively costly. Hence, large farmers get more scope than the small farmers for adoption of high yielding winter vegetable varieties. Hoque (1993), Pal (1995) and Islam (2002) observed the similar significant and positive relationship between these two variables.

3.4.5 Relationship between annual family income of the farmers and their adoption of high yielding winter vegetable varieties

The relationship between annual family income of the farmers and their adoption of high yielding winter vegetable varieties was measured by testing the following null hypothesis:
"There was no relationship between annual income of the farmers and their adoption of high yielding winter vegetable varieties."

Computed value of the correlation co-efficient between the annual income of the farmers and their adoption of high yielding winter vegetable varieties was found to

be +0.211 as shown in Table 4.3.1. The following observations were recorded regarding the relationship between the two variables under consideration:

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

b) The computed value of "r" (r= +0.211) was larger than the table value (r=0.196) with 98 degrees of freedom at 0.05 level of probability.

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

d) The null hypothesis was rejected

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

4.3.6 Relationship between cosmopoliteness of the farmers and their adoption of high yielding winter vegetable varieties

The relationship between cosmopoliteness of the farmers and their adoption of high yielding winter vegetable varieties was examined by testing the following null hypothesis:

"There was no relationship between cosmopoliteness of the farmers and their adoption high yielding winter vegetable varieties."

The co-efficient of correlation (r) between the concerned variables was found to be 0.216 as shown in Table 4.3.1. This led to the following observations regarding the relationship between the two variables under consideration:

a) The trend of relationship between the two variables was positive direction.
b) The computed value of "r" (r= 0.216) was found to be greater than the table value (r= 0.196) with 98 degrees of freedom at 0.05 level probability.
c) The co-efficient of correlation between the concerned variables was significant at 0.05 level of probability.
d) The null hypothesis could be rejected.

The researcher concluded that cosmopoliteness of the farmers had a positive and significant relationship with their adoption of high yielding winter vegetable varieties. This meant that the vegetable growers having more cosmopoliteness possessed higher knowledge on high yielding winter vegetable varieties. A more cosmopolite grower used to visit many places outside his own social system and come in contact with different things which help him to develop a positive attitude towards adopt in high yielding winter vegetable varieties. Mostafa (1999) found the similar findings.

4.3.7 Relationship between organizational participation of the farmers and their adoption of high yielding winter vegetable varieties

In order to determine the relationship between organizational participation of the farmers and their adoption of high yielding winter vegetable varieties, the following null hypothesis was tested:
"There was no relationship between organizational participation of the farmers and their adoption of high yielding winter vegetable varieties."

To find out the relationship, the correlation co-efficient was computed and found to be 0.063 as shown in Table 4.3.1 which led to the following observations between the concerned variables under consideration:

a) The relationship showed positive trends between the two variables.
b) The computed value of "r" (r= 0.063) was smaller than the table value (r=0.196) with 98 degrees of freedom at 0.05 level of probability.
c) The co-efficient of correlation between the two concerned variable was not significant at 0.05 level of probability.
d) The null hypothesis was not rejected.

From the above observations, it might be concluded that there was no significant and positive relationship between organizational participation of the farmers and their adoption of high yielding winter vegetable varieties. The findings thus indicated that the farmers with some participation in organization had no influence to adopt high yielding winter vegetable varieties. Talukder (2006) found the similar significant but negative relationship between these two variables.

4.3.8 Relationship between extension media contact of the farmers and their adoption of high yielding winter vegetable varieties

The relationship between extension media contact of the farmers and their adoption of high yielding winter vegetable varieties was measured by the following null hypothesis:

"There was no relationship between extension media contact of the farmers and their adoption of high yielding winter vegetable varieties."

The co-efficient of correlation between the concerned variables was found to be +0.201 as shown in Table 4.3.1. This led to the following observations regarding the relationship between the two variables under consideration:

a) The relationship showed a positive trend between the two variables.
b) The computed value of "r" (r= +0.201) was found to be higher than table value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.
c) The co-efficient of correlation between the concerned variables was significant at 0.05 level of probability.
d) The concerned null hypothesis was rejected.

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

4.3.9 Relationship between innovativeness of the farmers and their adoption of high yielding winter vegetable varieties

The relationship between innovativeness of the farmers and their adoption of high yielding winter vegetable varieties, the following null hypothesis was tested:

"There was no relationship between innovativeness of the farmers and their adoption of high yielding winter vegetable varieties."

Computed value of the correlation co-efficient between the innovativeness of the farmers and their adoption of high yielding winter vegetable varieties was found to be +0.169 as shown in Table 4.3.1. The following observations were recorded regarding the relationship between the two variables under consideration

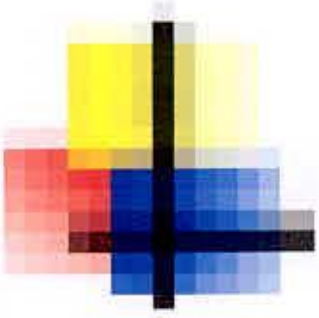
a) The relationship showed a tendency in the positive direction between the concerned variables.

b) The computed value of "r" (r = +0.169) was smaller than the table value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.

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

d) The null hypothesis was not rejected.

Considering the findings, the researcher concluded that innovativeness of the farmers had no significant but positive relationship with their adoption of high yielding winter vegetable varieties. Mostafa (1999) also found that innovativeness of the farmers had no significant relationship with their adoption of mango cultivation practices



CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This Chapter presents the summary of findings, conclusion and recommendation of the study.

5.1 Summary of the Findings

The major findings of the study are summarized below:

5.1.1 Selected characteristics of the vegetable growers

Age

Age of the growers was found to range from 22 to 67 years. The average age was 42.35 years with the standard deviation 11.61. The highest proportion (48 percent) of the respondents fell in the middle-aged category compared to 28 percent young and 24 percent old aged category.

Education

Education scores of growers ranged from 0 to 14. The average score was 6.04 with the standard deviation 3.44. A large proportion (48 percent) of the respondents fell under category of "primary education" compared to 44 percent "secondary education", 7 percent "above secondary education" and only 1 percent having "no education". Thus almost all the respondents had the education.

Family size

The family size of the growers ranged from 3 to 12. The average score was 6.04 with the standard deviation 2.43. The large proportion (50 percent) of the

respondents belonged to the "small family" category compared to 29 percent belonged to "medium family" category and 21 percent to "large family" category

Farm size

The farm size of the growers in the study area ranged from 0.16 to 2.17 hectares (ha). The average farm size was 0.74 ha with the standard deviation 0.38. The highest proportion (44 percent) of the farmers had medium farm compared to 35 percent had small farm and 21 percent having large farm.

Annual family income

Annual family income of the growers ranged from Tk. 12000 to 96000 with the mean of Tk. 27.67 thousand and standard deviation 20.76. The highest proportion (54 percent) of the respondents had Low annual income compared to 28 percent having very low and 18 percent under medium annual income.

Cosmopoliteness

The observed cosmopoliteness ranged from 6 to 18 with an average 10.50 and standard deviation 3.21. The highest proportions (48 percent) of the respondents were "low cosmopoliteness", while 35 percent of them being "medium cosmopoliteness", and only 17 percent under "high cosmopoliteness".

Organizational participation

The observed organizational participation ranged from 0 to 17 with an average 3.26 and standard deviation 3.28. Half (50 percent) of the respondents had low participation in organizations which was highest. A mentionable number (22 percent) having no organizational participation, while 21 percent had medium and only 7 percent of the respondent had high organizational participation.

Extension contact

Extension contact ranged from 5 to 33 with an average 21.24 and standard deviation 9.10. The highest proportion (43 percent) farmers of the study area had high extension media contact, while 38 percent had medium extension media contact and 19 percent had low extension media contact.

Innovativeness

Innovativeness of the farmers ranged from 2 to 20. The mean score was 10.53 and standard deviation 4.37. The highest proportion (51 percent) of the farmers had low innovativeness as compared to 29 percent medium innovativeness and 20 percent had very low innovativeness.

5.1.2 Adoption of High Yielding Winter Vegetable Varieties by the Growers

The adoption scores of the growers ranged from 26 to 80 with an average of 44.78 and the standard deviation 12.84. The highest proportion (51 percent) of the farmers fell under the medium adopter's category, while 27 percent had low adopters and only 22 percent had high adopters. Thus, an overwhelming majority (73 percent) of the farmers had medium to high adoption.

5.1.3 Relationship between Selected Characteristics of the Growers and their Adoption of High Yielding Winter Vegetable Varieties

To explore the relationship of the nine selected characteristics of the farmers with their adoption of high yielding winter vegetable varieties, nine null hypotheses were formulated. For test hypothesis, co-efficient of correlation (r) was computed. Five (0.05) percent level of significance was the basis for rejecting a null hypothesis. The results of hypothesis testing are presented below in brief:

Correlation analysis indicated that age, education, farm size; annual family income, cosmopoliteness and extension media contact were found to have significant relationships with the adoption of high yielding winter vegetable varieties. On the other hand family size, organizational participation and innovativeness of the farmers were found to have insignificant relationship with their adoption of high yielding winter vegetable varieties.

5.2 Conclusions

Findings of the study and the logical interpretations of their meaning in light of other relevant facts prompted the researcher to draw the following conclusions:

1. Findings indicated that the three-fourth (73 percent) of the farmers had medium to high adoption. So, it may be concluded that the adoption behaviour of the growers in respect of high yielding winter vegetable varieties presents a promising picture, but there is a further scope for increasing the extent of adoption of high yielding winter vegetable varieties.
2. The study indicated that majority (76 percent) of the respondents comprised of medium age and its relationship with their adoption of high yielding winter vegetable varieties was negatively significant. It may therefore be concluded that extension teaching should be given to all age categories of the farmers especially on the young and middle aged farmers because they are more receptive than the older.
3. Findings of the study showed a positive significant relationship of education with the adoption of high yielding winter vegetable varieties. It may, therefore, be concluded that enhancement of formal and non-formal education among the growers may contribute positively towards the formation of favourable mental make up for the adoption of high yielding winter vegetable varieties.

4. Farm size of the vegetable growers showed positive and significant relationship with their adoption of high yielding winter vegetable varieties. The growers having large farm are generally economically solvent and they are able to adopt high yielding winter vegetable varieties. Considering the facts it may be concluded that growers with small and large farm size should be encouraged to adopt high yielding winter vegetable varieties.

5. Annual family income of the vegetable growers showed positive significant relationship with their adoption of high yielding winter vegetable varieties in the study area. This means the more income of the growers; the higher may be their adoption of high yielding winter vegetable varieties.

6. Cosmopoliteness of the farmers had a significant and positive relationship with their adoption of high yielding winter vegetable varieties. Though cosmopoliteness an individual grower becomes aware of the recent information on the various aspects of winter vegetable. Consequently they become motivated to adopt the high yielding winter vegetable varieties due to influence by others. The findings of the study lead to the conclusion that for successful adoption of high yielding winter vegetable varieties, the growers need to be cosmopolite for their awareness of high yielding winter vegetable varieties.

7. Extension contact of the vegetable growers had a significant and positive relationship with their adoption of high yielding winter vegetable varieties. Extension media contact increases the outlook of the farmers which lead them to adopt Extension media contact increases the outlook of the farmers which lead them to adopt high yielding winter vegetable varieties.

8. Family size, organizational participation and innovativeness of the farmers had no significant relationship with their adoption of high yielding winter vegetable varieties. This means that these variables had no important influence on adoption of high yielding winter vegetable varieties.

5.3 Recommendations

Recommendations have been divided into two sub sections, viz. recommendations for policy implication and recommendation for further study.

5.3.1 Recommendations for policy implication

Based on the findings and conclusions of the study, the following recommendations are made:

1. The level of adoption of high yielding winter vegetable varieties was encouraging. However, there is a need of efforts for even wide adoption of high yielding winter vegetable varieties by the growers.
2. In view of the significant relationship between ages of the growers and their adoption of high yielding winter vegetable varieties, it is recommended that the extension workers should work with the growers of all age groups especially with the young and middle aged to promote the adoption of high yielding winter vegetable varieties.
3. Farm size of the farmers had positive significant relationship with their adoption of high yielding winter vegetable varieties. On the other hand, majority of the farmers had small and medium farms and they could give more attention to their farming operation as they generally work on the farm. Hence, extension workers should work with the small and medium farmers so as to increase the adoption of high yielding winter vegetable varieties on a significant scale.
4. The annual family income of the growers had significant and positive relationship with their adoption of high yielding winter vegetable varieties. It leads to the recommendation that extension service should provide adequate farm management advice to the growers for increasing their farm income. It is a fact that if income were increased, grower's receptive capacity to adoption of

high yielding winter vegetable varieties will be increased and thereby production will be increased.

5. Cosmopoliteness of the growers had significantly and positively correlated with their adoption of high yielding winter vegetable varieties. However, 48 percent of the growers had low cosmopoliteness. Therefore, it is recommended that the extension workers should mobilized the vegetable growers for increasing their adoption of high yielding winter vegetable varieties by arranging field tour and agricultural fair.
6. Extension contact of the growers had significant and positive relationship with their adoption of high yielding winter vegetable varieties. Hence the concerned authorities to take necessary steps to increase the extension contact of the growers.

5.3.2 Recommendations for further study

A short term and sporadic study being conducted in some specific location can not provide all information for proper understanding about adoption of high yielding winter vegetable varieties and other related matters. Further studies should be under taken covering more dimensions of high yielding winter vegetable varieties.

1. The present study was conducted in Kalaroa upazila under Satkhira district. It is recommended that similar studies should be conducted in other vegetable growing areas of Bangladesh.
2. This study investigated the relationship of nine characteristics of the growers with their adoption of high yielding winter vegetable varieties as dependent variable. Therefore, it is recommended that further study be conducted with other independent and dependent variable.
3. In the present study organizational participation and innovativeness had no significant relationship with their adoption of high yielding winter vegetable

varieties. Moreover, cosmopoliteness had significant relationship with their adoption of high yielding winter vegetable varieties. In this connection, further verification is necessary.

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

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APPENDICES A

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An interview schedule on

"Adoption of High Yielding Winter Vegetable Varieties by the Farmers of Kalaroa Upazila under Satkhira District".

Serial No. .....

Name of the respondent .....

Village ..... Union .....

Upazila District .....

.....

(Please answer the following questions)

1. Age

How old are you?----------(years)

2. Educational Qualification

What is the extent of your education?

a) Don't know reading and writing (----------)
b) Don't know reading and writing but can sign only (----------)
c) Passed ----------class

3. Family Size

Please mention the number of your family members including yourself

a) Male ---------- members
b) Female ---------- members
c) Total ---------- members

4. Farm Size

Please furnish area of your land according to use

Sl No.	Type of land	Area	
		Local	Hectare
1.	Homestead (including pond)		
2.	Own land under own cultivation		
3.	Land taken from others on lease		
4.	Own land given to others on Lease		
5.	Own land taken to others on borga		
6.	Own land given to others on borga		
7.	Others		
Total			

5. Annual Family Income

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

a) Income from agricultural crops

Sl No.	Source of income	Total production (kg/unit)	Price per kg/unit (Tk.)	Total price (Tk.)
1.	Vegetables			
2.	Rice			
3.	Jute			
4.	Wheat			
5.	Pulse crops			
6.	Oil crops			
7.	Others			
Sub total (a)				

b) Income from livestock and fisheries

Sl No.	Source of income	Total production (kg/unit)	Price per kg/unit (Tk.)	Total price (Tk.)
1.	Livestock			
2.	Poultry			
3.	Fisheries			
4	Others			
	Sub total (b)			

C. Income from non-agricultural sources

Sl No.	Source of income	Income	
		Monthly income (Tk.)	Annual income (Tk.)
1.	Service		
2.	Business		
3.	Daily labor		
4	Others		
	Sub total (c)		

Grand total = a + b + c = ---------- Tk.

6. Cosmopoliteness:

Please indicate how frequently you visit the following places within a specific period.

Sl. No	Place of visit	Frequency of visit			
		Regularly	**Occasionally**	**Rarely**	**Not at all**
01.	Visit to market/relatives/ friends outside of your own village but within your own union	8 or more times/month	4-7 times /month	1-3 times /month	No visit
02.	Visit to other Union	5 or more times/month	3-4 times / month	1-2 times / month	No visit
03.	Visit to own Thana head quarter	4 or more times/month	2-3 times / month	1 time / month	No visit
04.	Visit to other Thana headquarter	4 or more times/year	2-3 times/ year	1 time/ year	No visit
05.	Visit to own district town/headquarter	3 or more times/year	2 times/ year	1 time/ year	No visit
06.	Visit to other district town/headquarter	3 or more times/year	2 times/ year	1 time/ year	No visit
07.	Visit to capital city or other metropolitan city	3 or more times/year	2 times/ year	1 time/ year	No visit

7. Organizational participation

Please mention the Organization that you are associated with:

Name of the organization	**No association**	**General member with duration**	**Executive member with duration**	**President/ Secretary of the committee with duration**
a. Union council				
b. Cooperative Society				
c. NGO (specify the name)				
d. School Committee				
e. Madrasa Committee				
f. Bazar Committee				
g. Others (Sports committee/ Village development committee)				

8. Extension Contact

Please state the extent your contact with the following agricultural extension media.

A) Personal media

Sl No.	Name of the information of sources	Extent of contact			
		Regularly	**Occasionally**	**Rarely**	**Not at all**
1.	Officer of DAE (UAO, AAO, AEO)	1-2 times/month	At least 1 time/2 month	1-5 times year	o times/year
2.	Officer of other extension agencies (ULO, UFO)	2-3 times/month	1-2 times/month	1-5 times year	o times/year
3.	Sub-Assistant Agriculture Officer (SAAO)	3-4 times/month	1-2 times/month	1-3 times/year	o times/year
4.	NGO workers	3-4 times/month	1-2 times/month	1-2 times/year	o times/year
5.	Retailers (fertilizer & insecticide dealers)	3 times or more/month	1-2 times/month	1-2 times/year	o times/year

B) Group media

Sl No.	Name of the information of sources	Extent of contact			
		Regularly	**Occasionally**	**Rarely**	**Not at all**
1.	Participation in group meeting/discussion	3 times/year or more	1-2 times/year	1-2 times/year	O times/year
2.	Participation in result demonstration	3 times/year or more	1-2 times/year	1 time/year	O times/year
3.	Field day	3 times/year or more	2 times/year	1 times/year	O times/year

C) Mass media

Sl No.	Name of the information of sources	Extent of contact			
		Regularly	Occasionally	Rarely	Not at all
1.	Listening to agricultural radio programmes	4-7 time/year	1-3 time/year	1-3 time/month	O times/year
2.	Watching agricultural programmes of television	1-2 days/week	2-3 days/month	1-5 time/year	O times/year
3.	Reading printed materials like leaflet, bulletin, magazines etc.	1 piece/month	3-5 pieces/year	1-2 pieces/year	O times/year
4.	Watching agricultural posters, flip charts, advertisement (in newspaper)	1 piece/month	3-5 pieces/year	1-2 pieces/year	O times/year

9. Innovativeness:

Please indicate the extent of use of the following modern agricultural practices:

Sl. No.	Name of innovation	Do not use	Application Period		
			1 year after hearing	2-3 years after hearing	Above 3 years after hearing
01.	Use of hybrid vegetables seed				
02.	Use of Compost				
03.	Use of Bio-fertilizer				
04.	Use of Gypsum				
05.	Use of Granuler urea				
06.	Use of green manure in crop cultivation				
07.	Use of herbicides/weedicides				
08.	Use of light-traps				
09.	Use of modern agricultural machineries(Power tiller/Pump/Seed driller/Drum seeder)				

10. Adoption of High Yielding Winter Vegetable Varieties

Sl. No	Name of Varieties	2004		2005		2006	
		Potential area (p)	Used area (u)	Potential area (p)	Used area (u)	Potential area (p)	Used area (u)
1.	Diamond (Potato)						
2.	Manik (Tomato)						
3.	Tasakisan (Radish)						
4.	Uttara (Brinjal)						

Thank you for your kind co-operation

Date: ----------

_____

(Signature of the interviewer)

Appendix B

Correlation matrix showing interrelationship among all the variables

	A	B	C	D	E	F	G	H	I	J
A	1									
B	-0.446**	1								
C	0.835**	-0.480	1							
D	0.272**	-0.081	0.229*	1						
E	0.205*	0.320	0.157	0.353**	1					
F	0.156	0.058	0.191	0.079	0.048	1				
G	-0.207*	0.424	-0.082	0.079	0.172	0.184	1			
H	0.161	0.178	0.112	0.112	0.024	0.511**	0.114	1		
I	0.123	0.150	0.051	0.383**	0.229*	-0.057	-0.036	0.093	1	
J	-0.275**	0.383**	-0.173	0.207*	0.240*	0.216*	0.063	0.201*	0.169	1

* Correlation is significant at 0.05 level of Probability
** Correlation is significant at 0.01 level of Probability

A = Age
B = Education
C = Family size
D = Farm size
E = Annual family income
F = Cosmopoliteness
G = Organizational participation
H = Extension media contact
I = Innovativeness
J= Adoption of high yielding winter vegetable varieties