CONSTRAINTS FACED BY THE FARMERS IN POTATO CULTIVATION IN JHIKARGACHA UPAZILA UNDER JESSORE DISTRICT

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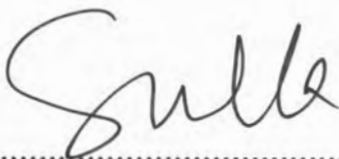
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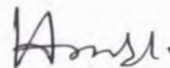for the degree of

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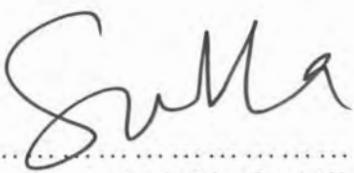...
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CERTIFICATE

This to certify that the thesis entitled, *"CONSTRAINTS FACED BY THE FARMERS IN POTATO CULTIVATION IN JHIKARGACHA UPAZILA UNDER JESSORE DISTRICT"* submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE in AGRICULTURAL EXTENSION embodies the result of a piece of *bona fide* research work carried out by MD. ABDUL AZIZ, Roll No. 00460, Registration No. 00460 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

Dated:...............
Dhaka, Bangladesh.

(Professor Md. Shadat Ulla)
Supervisor

Dedicated to
My
Beloved Parents

ACKNOWLEDGEMENT

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ABSTRACT

The purpose of the study was to find out the extent of constraints faced by the farmers in respect of potato cultivation on the six selected dimensions in potato cultivation and to explore the relationships between constraints faced by the farmers in potato cultivation and farmers' seven selected characteristics. Data were collected by an interview schedule from 80 farmers selected randomly from a population of 270 of ten villages of Jhikargacha upazila under Jessore district during the period of 1st July to 30th July 2006.Findings of the study indicated that majority (71%) of the farmers faced medium constraints in use of quality seed, compared to 24% faced high constraints and only 5% faced low constraints in potato cultivation. In using fertilizers the majority (76%) of the farmers faced medium constraints, compared to 23% and only 1% faced high and low constraints respectively. In using irrigation it was found that the majority (67%) of the farmers faced medium constraints, compared to 24% and only 9% faced high and low constraints respectively. In case of potato preservation it was found that the majority (53%) of the farmers faced high constraints, compared to 47% faced medium constraints and there was no one who faced low constraints in potato preservation. In case of potato marketing, it was found that the majority (79%) of the farmers faced medium constraints; compared to 9% faced high constraints and 12% faced low constraints in potato marketing. In using agricultural credit, it was found that the majority (44%) of the farmers faced medium constraints, compared to 27% faced high constraints and 23% faced low constraints and 6% did not take any loan in potato cultivation. The comparative constraints faced by the farmers in the six selected dimensions were shown by the Constraints Facing Index (CFI). The CFI indicated that the potato farmers faced high constraints in potato preservation, as indicated by it's of CFI 253. Extent of constraints faced in use of fertilizers came next in rank as shown by the CFI of 222, then use of quality seed (CFI of 219), then use of irrigation (CFI 215), then potato marketing (CFI 197) and use of agricultural credit (CFI of 192) respectively. The average overall constraints faced score was 81.44. A large number (62%) of potato farmers faced medium overall constraints faced compared to 24% farmers faced high constraints and 14 % farmers faced low constraints in potato cultivation.

Statistical tests showed that education, farm size, annual family income knowledge on potato cultivation, extension contact and social participation of the farmers had significant negative relationships with their constraints faced in potato cultivation.

Chapter I

Introduction

CHAPTER I

Introduction

1.1 General Background

Bangladesh is basically a rural based agricultural country. It is a developing country crowded with the population of about 140 million in the area of 1,47,570 square km. Agriculture plays the vital role in capital formation. About 84.5 % of her total population lives in the areas and directly and indirectly depend on agriculture for their livelihood (BBS, 1998). About 63.2 % of her population is engaged in agriculture and agriculture related activities (BBS, 2002). The country stands 137th among 177 countries listed in the human development index by UNDP in 2006. Agriculture is the dominant sector of Bangladesh economy. Agriculture related sector contribute to as much as 25.33% of Gross Domestic Product (GDP) of the country (BBS, 2002).Again agriculture also supplies raw materials for industrial production and food stuff for human and animal consumption.

In spite of dominance of agriculture in the national economy, Bangladesh is facing chronic food shortage due to rapid of growth of population and has to import on an average 1.5 million tons of food grains in each year (BBS, 2002).The present rice and wheat production are not sufficient to meet the increasing requirements of calories for the growing population in the country. In this regard, potato can play an important role as an alternative and multipurpose food crop of Bangladesh. The actual and potential role of agricultural sector in the economy of Bangladesh is indeed, enormous, considered from multidimensionality of it activities. Yet she cannot feed her population and has to import on an average of 1.5 million tons food grains each year. The causes may be due to the fact that agriculture as a whole remains to be traditional with its century old cultural practices. That is why yield of the crops are one of the world's lowest. The present rice production is not sufficient to meet the increasing requirement of calories for the growing population in the country. In this

regard Potato can play an important role as an alternative and multipurpose food crop of Bangladesh. It is also an important cash crop of the country.

Potato is the leading vegetable crops in the world which occupy the top most position after rice and wheat both in respect of production and consumption (Thompson and Kelly, 1957). Potato is produced in 132 countries out of 193 independent countries of the world. At present, at least 40 countries eat potatoes as a staple food (Islam, 1987).

The importance of potato in the economy of Bangladesh can hardly be over emphasized. Besides, potato is the main source of important nutrients, but the production of potato has not been able to keep pace with the increased demand with the population growth. A comparative picture of area, production and yield per hectare of potato in Bangladesh along with the major potato producing countries are shown in Table 1.1.

Table 1.1 Area, production and yield per hectare of potato in different countries of the world in 2000

Country	Area ('000 hectares)	Production ('000 metric tons)	Yield (kg/ha)
Bangladesh	149 F	1702 F	11250
India	1300 F	23500 F	18077
Pakistan	110	1868	16915
Japan	98 F	2963 F	30328
Netherlands	18 F	8200 F	24809
Germany	302	12633	41832
UK	165	6648	40289
France	169	6652	39385
USA	547	23404	42788
Australia	41 F	2327 F	32126

Source: FAO, 2002; F= FAO estimate.

In spite of greater potentially of potato production, the farmers of Bangladesh are not free from constraints in the field of cultivating potato. Their cultivation technique is almost traditional; they use mainly local varieties and to some extent of modern varieties of seed. As there is little scope for increasing cultivating area but there is a great scope for increasing per unit production. Agricultural marketing is the crux of the problem of agricultural improvement in Bangladesh. Each country and each product have unique marketing constraints. In Bangladesh, marketing of perishable crop like potato is affected by its nature, climates conditions, availability of transportation facilities, nature and size of market demand and the efficiency of information system. The preservation and storage facilities in potato marketing in Bangladesh are inadequate and unsatisfactory both in the rural and urban areas. It is desirable to have cold storage, but with the present storage facilities only 10 % of total potatoes produced in the country can be preserved (Ahmad, 1977). A sizeable share of the produce is spoiled because of the lack of adequate storage facilities. According to a BARC report (1977), about 3 lakh tons of potatoes (one third of the total annual production) are wasted every year amounting a loss of more than taka 60 crores annually (Rahman, 1981).

If potatoes are not stored properly it causes enormous damage due to sprouting, water loss and rottening. The damage constraints are more critical at the farm level. Most of the farmers in Bangladesh are incapable overcoming of their constraints. The farmers are compelled to sell major part of their produce immediately after harvesting at a very low price, mainly because of not even temporary storage accommodation being available to them.

Therefore, the purpose of the study was to have an understanding of the constraints faced by the potato farmers. It was anticipated that such a study would discover the causes of the constraints related to cultivation, marketing, processing and storing of potato as well as help in cultivating an effective measure for potato production all over the country.

1.2 Statement of the Problem

With a view to have an understanding of the farmer's constraints in potato cultivation, the researcher undertook the investigation titled "Constraints faced by the farmers in potato cultivation in Jhikargacha upazila under Jessore district". The study will high light how much constraints faced by the potato farmers in respect of : - a) use of quality seed b) use of fertilizers c) use of Irrigation facilities d) potato preservation e) potato marketing f) use of agricultural credit.

The purpose of the study was to find out the answers of the above constraints faced by the potato farmers in potato cultivation. For a clear insight, the study also explored the relationship of the selected characteristics of potato farmers with their faced constraints. Potato is a very popular vegetable crop in the study area. The views and opinion of the farmers under study on the constraints faced by the farmers on potato cultivation would be helpful to the policy makers for its expansion in a wider scale.

Therefore, constraints in the scientific cultivation of potato as perceived by the farmers might be influenced by their personal, economic, social and essential to have an understanding of the potato cultivation constraints faced of the farmers and its relationship with their various characteristics for effective planning and execution of increasing potato cultivation in Bangladesh. So the study was taken to get the answers of the following questions:

1. What are the constraints faced by the potato farmers in respect of
   a) use of quality seed b) use of fertilizers c) use of irrigation d) potato preservation e) potato marketing f) use of agricultural credit?
2. What are the characteristics of the potato farmers?
3. What are the relationships between constraints faced by the potato farmers and their characteristics?

To get the answers of the above questions, the researcher undertook this research programme entitled "Constraints faced by the farmers in potato cultivation in Jhikargacha upazila under Jessore district."

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1.3 Specific objectives of the study

The specific objectives of this study were as follows:

1. To determine the extent of constraints faced by the farmers in the following dimensions of potato cultivation. These dimensions included: -

   a) Use of quality seed

   b) Use of fertilizer

   c) Use of Irrigation

   d) Potato preservation

   e) Potato marketing

   f) Use of agricultural credit.

2. To determine and describe the selected characteristics of the farmers. The selected characteristics were:

   i) Age

   ii) Education

   iii) Farm size

   iv) Annual family income

   v) Knowledge on potato cultivation

   vi) Extension contact

   vii) Social participation

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

1.4 Scope and limitations of this study

The study was undertaken in order to have an understanding of the constraints faced by the farmers in cultivation of potato. In order to conduct the research in a meaningful and manageable way it becomes necessary to impose some limitations in regard to certain dimensions of the study. Considering the limitations of time, money and other resources available to the researcher, the following limitations have been observed throughout the study:

1. The study was confined to Jhikargacha upazila under Jessore district.
2. The study was limited to the potato farmers and they constituted the population of this study.
3. Population for the study was kept confined within the heads of the farm families because they were the decision makers in their respective families and also to those who were directly associated with the potato cultivation.
4. There were various dimensions in potato cultivation and many sorts of constraints were connected with this issue. It was not possible for the researcher to include all dimensions of potato cultivation constraints in a single study. In this study the researcher considered only six constraints faced by the potato farmers in potato cultivation.
5. Collection of all relevant data was limited to the farmers growing potato in the study area.
6. Relationship of the constraints in potato cultivation could be studied with the various characteristics of the farmers but only seven characteristics of the farmers were selected for investigation in this study.

1.5 Assumptions of the study

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

1. The respondents included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.
2. The responses furnished by the respondents were valid and reliable. They expressed the truth while passing their opinions and providing information.
3. The views and opinions furnished by the potato farmers included in the sample were the representative views and opinions of all the potato farmers of the study area.
4. The researcher who acted as interviewer was well adjusted to the social and cultural environment of the study area. Hence the respondents furnished their correct opinions without hesitation.

1.6 Hypothesis of the study

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

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

1. There is no relationship between age of the farmers and their faced constraints in potato cultivation.

2 There is no relationship between education of the farmers and their faced constraints in potato cultivation.

3. There is no relationship between farm size of the farmers and their faced constraints in potato cultivation.

4. There is no relationship between annual family income of the farmers and their faced constraints in potato cultivation.

5. There is no relationship between knowledge on potato cultivation of the farmers and their faced constraints in potato cultivation.

6. There is no relationship between extension contact of the farmers and their faced constraints in potato cultivation.

7. There is no relationship between social participation of the farmers and their faced constraints in potato cultivation.

1.7 Definition of terms

Age: Age of a respondent was defined as the period of time from his birth to the time of interview.

Education: Education of an individual farmer was defined as the formal education received up to a certain level from an educational institute or institutes at the time of interview.

Farm size: Farm size of a respondent referred to the area owned by a farmer on which he carried his farming and family business, the area being estimated in terms of full benefit to the farmers. A farm was considered to have full benefit from the cultivated area either owned by him or obtained on lease from others and half benefit from the area which was either cultivated by him on borga or given to others for cultivation on borga basis.

Annual family income: Annual family income was defined as total earning of a farmer and the members of his family from farming and other sources (business, services etc) during a year. In fact, it was gross family income of a respondent.

Knowledge on potato cultivation on potato cultivation: Knowledge on potato cultivation of an individual referred to his extent of understanding and skills on different dimensions of potato cultivation.

Extension contact: The term extension contact was used to refer one's exposure to various extension communication media or extension teaching sources.

Social participation: Social participation of a respondent referred to his taking part in different social organizations either as an ordinary member, or an executive committee member or an officer.

Use of quality seed: It referred to the use of potato seeds supplied from the BADC sale centre or other commercial organizations having all desirable qualities.

Use of fertilizer: It referred to the use of chemical fertilizers prescribed to be used for the cultivation of potato. The fertilizers included urea, T.S.P., M.P., zypsum and sulphur etc.

Use of irrigation: The term irrigation was defined as the use of artificial supply of water in potato field by the farmer in order to produce potato in a better way.

Potato cultivation: Potato cultivation included the different stages of potato production, harvesting, processing conservation and marketing of the potato.

Constraints in Potato cultivation: Constraints in potato cultivation referred to different constraints as perceived by the farmers in cultivating this crop.

Preservation: The term preservation meant the entire handling procedures, i.e. harvesting, grading, striping, packaging, cooling and storage.

Marketing: The term marketing meant the entire process of directing the flow of goods and services from producer to consumer.

Chapter II
Review of literature

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to review the researches conducted in line of the major focus of study. This study as already indicated, was undertaken to have an understanding of the constraints faced by the farmers in potato cultivation and its relationship with the selected characteristics.

Literature having relevance to the present study has been reviewed in three sections. The first section deals with the literature on the constraints faced by the farmers in cultivating various crops and the second section deals with review of studies dealing with the relationships between selected characteristics and faced constraints in potato cultivation. The third section deals with the conceptual framework of the study.

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

2.1 Studies on Constraints Faced by the Farmers in Potato Cultivation and Other Crops

Ahsan (1964) conducted a study and found that potato marketing at farmer's level only theoretically appraised the efficiency of existing marketing system.

Marothia (1983) conducted a study and found that revealed that the majority of farmers still adopt a partial package of recommendations; mainly due to the high cost of inputs, financial limitations and risk of crop failure.

Akhter (1973) conducted a study on potato marketing in Comilla kotwali thana and he studied some structural and functional features of potato marketing.

King (1980) showed that the constraints of Cotton Development Project in Gambia were dominated by three main factors: i) low yield; ii) high labor input in comparison with groundnuts; iii) the relative prices paid to the farmers for groundnuts and cotton. There were no technical reasons why cotton cannot be grown.

Alam's (1981) investigation reveals the following facts about the existing constraints of marketing of potato in Dhaka city: a) lack of efficient transport b) lack of storage facilities c) improper grading d) dominance of whole sellers e) lack of proper market information and f) lack of adequate finance.

Zaag (1982) showed that the constraints of potato Development Programme in Rwanda were dominated by three main factors i) lack of quality seed potatoes of adapted varieties ii)Infections from *Phytopthora infestans* and *Pseudomonas solanacearum* iii) lack of technical knowledge among extension personnel and farmers.

Collins and Cannon (1983) showed that the constraints of sweet potato production in the United States are: Sweet potato weevil, mutations both in the seed roots and in the commercial crop, and low consumption and over production.

Arya and Shah (1984) conducted a study and identified five constraints: i) small and skewedly distributed holdings; ii) fragmented and scattered holdings; iii) shortage of lobour; iv) lack of availability of inputs and funds; v) lack of education, extension and training especially for women.

Raha et al. (1988) identified some common constraints of cotton cultivation. Those constraints were : lack of suitable land, lack of irrigation facility, shortage labour, shortage of cash money, lack of technical knowledge, low price of cotton and non-availability of seed, insecticides and fertilizers.

Kashem (1987) found some obstacles that inhibited farmers rapid adoption if Modern Rice Cultivation. These obstacles were fertilizer obstacles, plant protection obstacles, irrigation obstacles and other cultural obstacles.

Islam (1987) conducted a study on potato preservation in cold storage in Bangladesh including the marketing aspects. He found that price spread per metric ton of potatoes appropriated by traders was higher in case of cold stored potatoes than non-stored potatoes.

Zinyama (1988) conducted a study in Zimbabwe and revealed five constraints. These constraints were: i) lack of money with which to purchase seasonal agricultural inputs. Particularly fertilizers; ii) lack of basic farming implements, notably the ox-driven single furrow plough; iii) lack of draught cattle; iv) inadequate arable land; and v) inadequate family labour for agricultural work.

Ahmed (1993) in his survey explored different constraints faced by the farmers in cotton cultivation. His major findings were: high cost of fertilizers, lack of capital and loan facility, shortage of sufficient land for cotton cultivation, inadequate availability of inputs in time, irrigation water, lack of technical knowledge, lower price and lack of storage facility.

Gumisiriza et al. (1994) showed several constraints of wheat production in Uganda. These were: traditional farming practices, unavailability or lack of improved cultivars, information and technology transfer, rusts and foliar disease and in effected communication between research stations.

Rahman (1995) in his study, identified constraints faced by the farmers in cotton cultivation non-availability quality seed in time, unfavorable and high cost of fertilizer and insecticides, lack of operating capital, not getting fair weight and reasonable price according to grade.

Nkowani et al. (1995) identified in a paper that crop diversification through agro forestry may reduce constraints of the vulnerable section of the society.

Kumar et al. (1995) conducted a study and found that high input prices and low market prices for output were the measure constraints experienced by farmers in both adopted and non-adopted villages.

Muttaleb et al. (1998) revealed that among different constraints high fertilizer cost, high seed cost, lack of quality seed, lack of awareness, lack of technological knowledge and low price of potato at harvest period were perceived as barriers to the adoption of potato technologies.

Pramanik (2001) made an extensive study on twenty-four constraints of farm youth in Mymensingh villages relating to different constraints in crop cultivation. Major four constraints were: a) local NGO take high rate of interest against a loan, b) Lack of agricultural machinery and tools, c) lack of cash and d) financial inability to arrange improved seeds, fertilizers and irrigation.

Helmers et al. (2001) reported that crop contains reduce risk compared with monoculture system. He found that a maize-soybean rotation had significantly less risk than monoculture practices.

Agnew et al. (2002) found that the adoption of Harvesting Based Practice (HBP) barriers. These barriers were: sugar prices, wet weather, orange rust disease, system of harvester payment, insufficient cane quality feedback mechanism and physical, time and safety upon harvesting.

Ramachandran and Sripal (1990) identified different constraint in adoption of dry land technology for rain fed cotton in Kamaraj district, Tamilnado, India. They found that constraints faced by the farmers which were insufficient rainfall, susceptibility of inputs in time, lack of knowledge, insufficient livestock, risk due to failure of monsoon, high cost etc.

Freeman and Breth (1994) conducted a study on productivity of agricultural systems in the West African Savana. Study showed several constraints in farming practices such as intensive land use, fallow periods decline and crop cultivation spreads into marginal or ecological fragile lands, household food security and rural poverty.

Faroque (1997) found that female rural youth in Bhaluka (Mymensingh) lacked cash for buying seeds, seedlings and fisheries and deprived of necessary knowledge in improved vegetable cultivation. He further added that the majority of female rural youth faced very high (54%) constraints in crop cultivation.

Alam et al. (2000) conducted a survey on jute crops in seven districts of Bangladesh to find out the state of art in jute cultivation and found that scarcity of quality seeds, high labour wage and low market price of fiber were the major constraints of jute production.

2.2 Studies on the Relationship between Constraints Faced by the Farmers in Cultivating Potato and Their Selected Characteristics

2.2.1 Age and constraints faced by the farmers in potato cultivation

Hossain (1985) in a study on landless lobourers in Bhabakhali union of Mymensingh district found that there was no relationship between age of the landless lobourers and their problem confrontation. Similar findings were obtained by Ali (1999), Rashid (1999), Pramanik (2001), Ahmed (2002), Hossain (2002) and Salam (2003) in their respective studies.

Bhuyan (2002) in his study found a positive and significant relationship between age of the farmers and their constraint in banana cultivation. Similar findings were obtained by Rahman (1996) in his respective study.

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

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

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

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

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

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

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

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

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

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

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

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

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

2.2.2 Education and constraints faced by the farmers in potato cultivation

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

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

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

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

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

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

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

Mansur (1989) in his study on the feeds and feeding constraints confrontation found a significant negative relationship between the education of the farmers and feeds and feeding constraints confrontation. Similar findings were obtained by Haque (1995), Rahman (1996), Karim (1995), Faroque (1997), Pramanik (2001), Ahmed (2002), Hossain (2002),Bhuyan (2002),and Salam (2003) in their respective studies.

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

Islmail (2001) found in his study that there was no significant relationship between education and problem confrontation for farm youth. Similar relationships were obtained by Raha (1989) and Halim (2003) in their respective studies. Thus it could be concluded that an overwhelming majority of the researchers found a negative relationship between these two variables.

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

2.2.3 Farm size and constraints faced by the farmers in potato cultivation

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

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

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

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

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

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

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

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

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

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

Rahman (1995) in his study on constraints faced by the farmers in cotton cultivation at Muktagacha thana under Mymensingh district observed had significant negative relationship between the farm size of the farmers and their faced constraints in cotton cultivation. Similar findings were obtained by Rahman (1996), Faroque (1997), Ahmed (2002), Hossain (1985) and Ismail (2001) in their respective studies.

2.2.4 Annual family income and constraints faced by the farmers in potato cultivation

Hossain (1985) found a significant positive relationship between income of the farmers and constraints faced of the landless labourers.

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

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

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

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

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

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

Islam (1987) in his study on artificial insemination problem confrontation of the farmers found a negative significant relationship between annual family income of the farmers and poultry problem confrontation.
Mansur (1989) in his study on the feeds and feeding constraints confrontation found a significant relationship between the annual family income of the farmers and feeds and feeding constraints confrontation, but showed a negative trend.

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

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

2.2.5 Knowledge on potato cultivation and constraints faced by the farmers

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

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

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

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

Mansur (1989) in his study on the feeds and feeding constraints confrontation found a significant negative relationship between the technological knowledge in feeds and feeding cattle of the farmers and feeds and feeding constraints confrontation. Similar findings were obtained by Rahman (1996), Pramanik (2001), Hoque (2001), Ahmed (2002), Hossain (2002), Bhuyan (2002) and Halim (2003) in their respective studies. Raha (1989) in his study found that knowledge in modern boro paddy of the farmers had no significant relationship with their irrigation constraints confrontation. Anwar(1994) , Karim(1996), Rashid (1999), Ismail (2001), Salam (2003) and Rashid(2003) found similar findings in their respective studies.

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

2.2.6 Extension contact and constraints faced by the farmers in potato cultivation

Ali found that contact and non-contact farmers deferred significantly in respect of their extension contact. He observed that extension contact of the contact an non-contact farmers had significant contribution towards their agricultural knowledge.

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

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

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

Rahman (1995) in his study found that a significant negative relationship between the extension contact of the farmers and their faced constraints in cotton cultivation. Similar findings were obtained by Rahman (1996), Faroque (1997), Pramanik (2001), Hoque (2001), Ahmed (2002), Hossain (2002), Bhuyan (2002), Salam (2003) and Halim (2003) in their respective studies i.e. Higher the extension contact of the farmers, the lower was their constraints faced in respect of crop cultivation.

Islmail (2001) conducted a study and revealed that there was no significant relationship between education and problem confrontation fo farm youth. Similar findings were obtained by Raha (1989) and Hoque (2001) in their respective studies.

2.2.7 Social participation and constraints faced by the farmers in potato cultivation

Mahboob (1966) undertook a study and he suggestd that organizational participation of individuals may lessen their constraints faced and thus enhance their performance.

Wilson (1963) studied the characteristics of adults associated with leadership and interest in youth organization and came out with a series of findings and he suggested that organizational participation may have the effect of lessening the problem confrontation of individuals.

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

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

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

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

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

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

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

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

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

2.3 Conceptual Framework of the Study

It is evident from the past studies that every occurrence or phenomenon is the outcome of a number of variables, which maybe or may not be interdependent or interrelated with each other. In the other words, no single variable can contribute wholly to a phenomenon. Variables together are the cause and the phenomenon is effect and thus, there is effect relationship every where in the universe.

The conceptual framework of Rosenberg and Hovland (1960) was kept in mind framing the structure arrangement for the dependent variables. This study was conserved with the constraints faced by the farmers in potato cultivation. Thus the constraints in potato cultivation was the dependent variable and the selected characteristics of the potato farmers were considered as the independent variables. Constraint of an individual may be affected through interacting forces of many characteristics in his surroundings. It was therefore, necessary to limit the characteristics, which include: age, education, farm size, annual family income, knowledge on potato cultivation, extension contact and social participation.

Again, in order to have a clear understanding of the nature of potato cultivation constraint, the dependent variable was considered from the view of a number of dimensions of constraints. These dimensions included: use of quality potato seed, use of fertilizers, use of irrigation, potato preservation, potato marketing and use of agricultural credit constraints in potato cultivation.

Based on this discussion and review of literature the conceptual framework of this study has been formulated and shown in the Figure 2.1.

Independent variables

Farmers' characteristics

- Age
- Education
- Farm size
- Annual family income
- Knowledge on potato cultivation
- Extension media contact
- Social participation

Dependent variable

Constraints faced by the farmers in respect of potato cultivation

Dimensions of constraints

- Seed
- Fertilizer
- Irrigation
- Potato preservation
- Potato marketing
- Agricultural credit

Figure 2.1 Conceptual framework of the study

Chapter III

Methodology

Chapter III

Methodology

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

3.1 Source of data

Jhikargacha upazila under jessore district was selected as the area for this research work. The map of Jessore district and Jhikargacha upazila were shown as the study area in the Figure 3.1 and 3.2 respectively.

This study was aimed at the population of all the potato farmers of this upazila. Jhikargacha upazila consist of 11 unions. Data were collected from a sample of the potato farmers from Panisara, Gadhkhali, Nirbashkhola, Navharon and Jhikargcha unions of Jhikargacha upazila under Jessore district. These 5 unions were purposively selected from a total of 11 unions in Jhikargacha upazila under Jessore district. Out of 52 villages of those 5 unions, 10 villages were selected purposively. Because majority of the farmers practiced potato cultivation in those selected 10 villages of 5 unions.

The researcher prepared a list of the potato farmers of those 10 villages with the help of local union parisad members and chairmen, Assistant Agriculture Extension Officer and Upazila Agricultural Officer also help in this matter. After completing the list it was found that the total numbers of potato farmers were 270 as shown in table 3.1.

Those 270 potato farmers henceforth were the population of this study. Out of these 270 potato farmers; sample of 80 (i.e. 29.63%) potato farmers were selected randomly. The researcher also prepared a reserve list of 30 potato farmers to use them in case of non-availability of the respondents in the sample list.

Table 3.1 Distribution of potato farmers constituting the population, sample and reserve list in selected villages under Jhikargacha upazila

SL. No.	Name of the villages	Number of potato farmers		Farmers' included in the reserve list
		Population	Sample	
1	Gadkhali	28	9	3
2	Panisara	38	12	4
3	Nirbashkhola	20	5	2
4	Hajirali	36	11	4
5	Matikumra	16	4	2
6	Kulla	31	10	3
7	Bousa	24	7	3
8	Khulia	18	5	2
9	Sonakur	33	10	4
10	Navharon	26	7	3
	Total	270	80	30

Figure 3.1 A map of Jessore district showing the study area
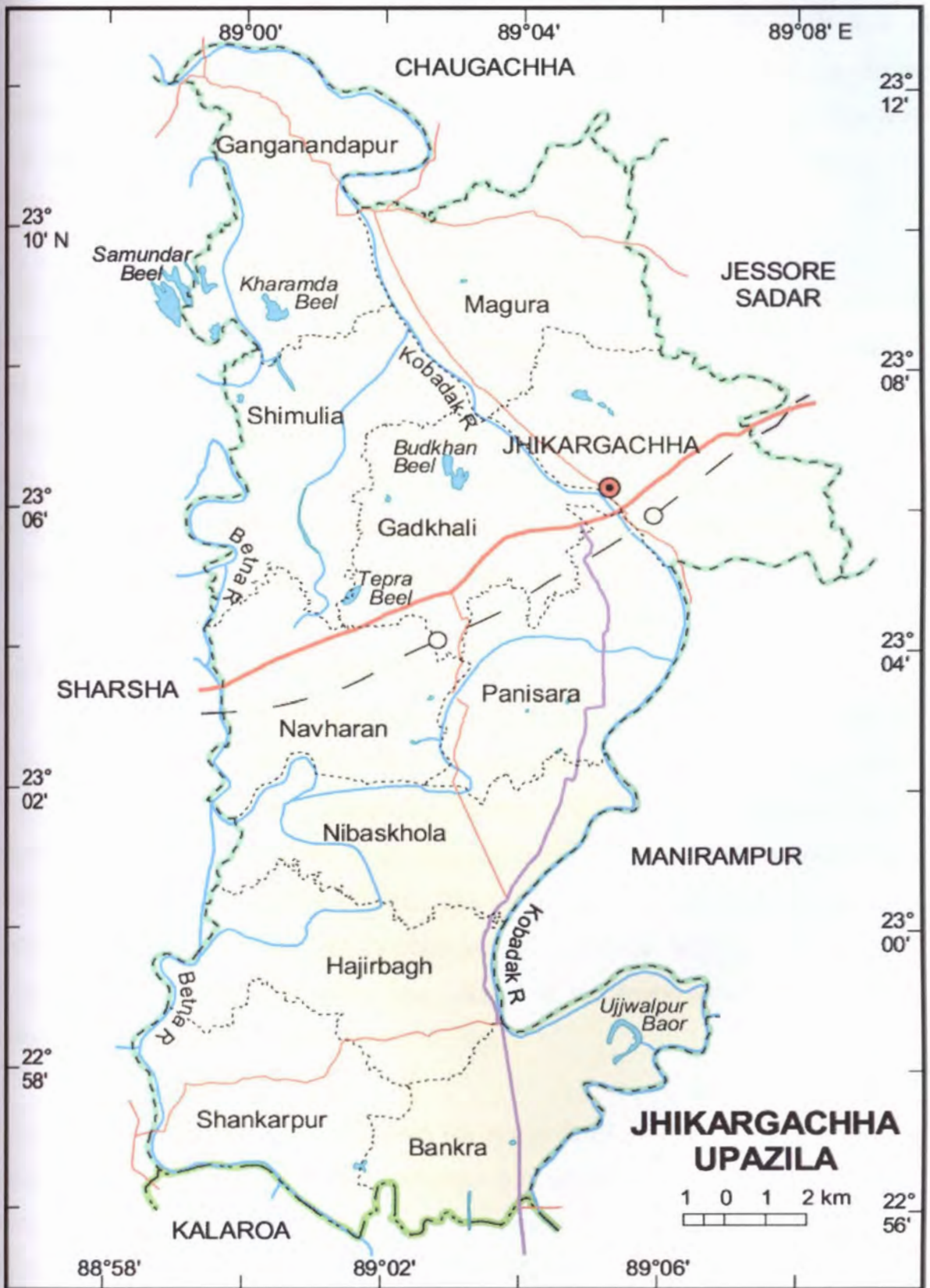
Figure 3.2 A map of Jhikargachha upazila showing the study area

3.2 Instrument for collection of data

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

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

3.3 Collection of data, processing of data and analysis

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

Data for this study were collected from the respondents of 10 villages by using the prepared interview schedule by the researcher himself in Bengali. Before going to the respondents for interview they were informed earlier, so that they would be available in their respective area. The interviews were held individually in the house or farms of the respective respondent.

No serious constraints were faced by the researcher in collecting data. It was not possible to collect data from six farmers from the original sample. They were not available for interview at the time of interviewing. The researcher collected data from the six potato farmers using the reserve list. Collection of data took 30 days from the 1st July to 30th July, 2006.

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

3.4 Variables of the study

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

3.5 Selection of dependent and independent variables

Constraints faced by the potato farmers was the main focus of this study and it was considered as the dependent variable which included such dimensions as : use of quality seed, use of fertilizer, use of irrigation, potato preservation, potato marketing and agricultural credit.

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

3.6 Measurement of variables

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

3.6.1 Measurement of independent variables

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

3.6.1.1 Age

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

3.6.1.2 Education

Education was measured in terms of grades of education (school/college) completed by an individual. It was expressed in terms of year of schooling. A score of one (1) was assigned for each year of successful schooling completed. For example, if a respondent passed the S.S.C examination, his education score was given as 10, if he passes the final examination of class six, his education score was given as 6. If a respondent did not know how to read and write, his education score was given as '0' (zero). A score 0f 0.5 (half) was given to that respondent who could sign his name only.

3.6.1.3 Farm size

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

Farm size= $A_1 + A_2 + \frac{1}{2} (A_3 + A_4) + A_5$

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

A_2= Own land under own cultivation

A_3= Area taken from others on borga system

A_4= Area given to others on borga system

A_5= Area taken from others on lease

3.6.1.4 Annual family income

Family income of a respondent was measured on the basis of total yearly earning from agriculture and other sources (service, business, daily labor etc.) by the respondent himself and other family members. Annual family income of a respondent was expressed in '000' taka.

3.6.1.5 Knowledge on potato cultivation

Knowledge on potato cultivation score of a respondent was measured by asking him 20 questions on different dimension of potato cultivation namely use of seed, fertilizer, irrigation, pesticide, potato preservation, marketing and other cultural

practices. The weights were assigned as 2 for each of the selected 10 questions and 3 for each of the selected another 10 questions. A respondent could get a full score for full correct answer of a question, zero (o) for wrong and no answer. Partial scores were given to partially correct answer. Thus a respondent could get a full score of 50 (10 x 2 +10x 3) for correct answers to all the 20 questions. Therefore, knowledge on potato cultivation score of the respondents could range from 0 to 50, 0 including no Knowledge on potato cultivation and 50 indicating very high knowledge on potato cultivation.

3.6.1.6 Extension contact

The extension contact of a respondent was measured with eight selected extension media. A scale was developed arranging the weights for 0, 1, 2, 3 and 4 for the responses for not at all, rarely, occasionally, often and regularly contact with these media respectively. Extension contact score of the respondents could range from 0 to 32, while 0 indicating no extension contact and 32 indicating very high extension contact.

3.6.1.7 Social participation

Social Participation of a respondent was measured according to nature of his participation in different social organizations during the time of interviewing and then duration was not considered.

Score was assigned according to the nature of participation of a respondent in an organization in the following manner:

Nature of participation	Scores
No Participation	0
Ordinary membership	1
Executive committee member	2
Executive Officer (president, Secretary, Treasure etc,)	3

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

3.6.2 Measurement of Dependent Variables

Constraints faced by the potato farmers were the dependent variable of the study. It was measured by constructing scales for the six selected dimensions as use of quality seeds, use of fertilizers, use of irrigation, potato preservation, potato marketing and use of agricultural credit. The scales contained a total of 47 constraints by taking 10, 10, 10, 6, 4 and 7 constraints from of use of quality seeds, use of fertilizers, use of irrigation, potato preservation, potato marketing and use agricultural credit dimensions respectively.

Score were assigned for the alternative responses as the following manner:

Extent of constraints	score
Not at all	0
Little	1
High	2
Very high	3

The scores obtained for all the statements for all dimensions of constraint were added together to obtain constraints faced score. The scores of the respondents could range from 0 to 30, 0 to 30, 0 to 30, 0 to 18, 0 to 12 and 0 to 21 for use of quality seed, use of fertilizer, use of irrigation, potato preservation, potato marketing and use of agricultural credit.

So, overall constraints faced scores of the respondents ranged from 0 to 141, while 0 indicating no constraint faced and 141indicating high constraint faced in potato cultivation.

3.7 Statistical Treatment

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

In order to explore the relationships between the constraints of the farmers and the selected independent variables, Co-efficient of correlation (r) was calculated. Five percent (0.05) level of probability was used as a basis for rejecting any null hypothesis.

Chapter IV
Results and Discussion
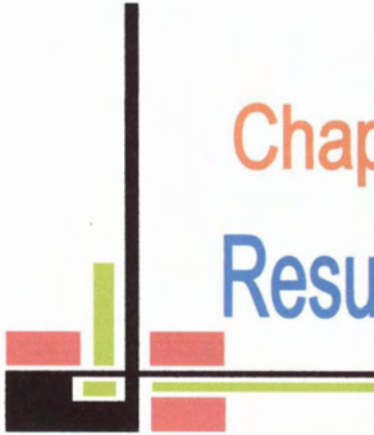
CHAPTER IV

RESULTS AND DISCUSSION

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

4.1 Characteristics of the Farmers

Different farmers possess different characteristics. The selected characteristics of the farmers were; age, education, farm size, annual family income, knowledge on potato cultivation, extension contact and social participation. Relationships between these seven characteristics of the farmers with their constraints faced in potato cultivation have been described in this chapter. Characteristics profiles of the respondents are shown in Table 4.1.

Table 4.1 Characteristics profile of the respondents

Sl. No	Characteristics	Measured by	Range	
			Possible	Observed
01	Age	Year	Unknown	24 - 55
02	Education	Years of scooling	Unknown	0-14
03	Farm size	Hectare	Unknown	0.62 -3.75
04	Annual family income	'000' taka	Unknown	80-310
05	Knowledge on potato cultivation	Score	0-50	16-40
06	Extension contact	Score	0-32	11-24
07	Social participation	Score	0-21	0-11

4.1.1 Age

Age of the respondents varied from 24 to 55 years, the average being 38.03 years with standard deviation of 7.31. The respondents were classified into three categories on the basis of their age in Table 4.2.

Table 4.2 Classification of the farmers according to their age

Categories	Age in Years	Potato farmers		Mean	Standard deviation
		Number	Percent		
Young	Up to 34	25	31		
Middle-aged	35 to 50	50	63	38.03	7.31
Old	Above 50	5	6		
Total		80	100		

Data furnished in Table 4.2 indicate that 31 percent of the respondents were young as compared to 63 percent being middle aged and only 6 percent being old. Therefore it could be said that decision regarding the farming practices in the study area was expected to be considerably influenced by the middle aged farmers.

4.1.2 Education

The level of education of the respondents ranged from 0-14. Here, the average educational score was 5.86 with a standard deviation of 4.11. On the basis of their education, the farmers were classified into four categories shown in Table 4.3.

Table 4.3 Classification of the farmers according to their education

Categories	Level of Education	Potato farmers		Mean	Standard deviation
		Number	Percent		
No education	Unable to read and write	11	14		
Primary education	Class I to V	27	34		
Secondary education	Class VI to X	31	38	5.86	4.11
Above secondary education	Above class X	11	14		
Total		80	100		

Data presented in the table 4.3 indicate that 14 percent the farmers had no education, 34 percent farmers were primary educated, 38 percent farmers were Secondary educated and 14 percent were above Secondary educated.

Education helps the farmers to face the adverse condition and adjust with unfavorable condition through reading leaflets, booklets, books and other printed materials in this case. The findings of this study, however, indicate that 14 percent of the farmers had no education and they faced a great difficulty in adjusting with the unfavorable condition regarding in the potato cultivation. Such consideration indicates the need for improving literacy level among the farmers for adjusting the adverse condition in the potato cultivation.

4.1.3 Farm Size

Farm size of the respondents ranged from 0.62 hectare to 3.75 hectare with a mean of 2.08 and standard deviation of 0.68. On the basis of their farm size, the farmers were classified into three categories as shown in Table 4.4.

Table 4.4 Classification of farmers according to their farm size

Categories	Farm size in (ha)	Potato farmers		Mean	Standard deviation
		Number	Percent		
Small farm	Up to 1	6	8	2.08	0.68
Medium farm	Above 1 to 3	69	86		
Large farm	Above 3	5	6		
Total		80	100		

Data presented in the Table 4.4 show that highest proportion (86 percent) of the farmers had medium farm compared to 8 percent having small farm and only 6 percent had large farm. The findings indicate that 92 percent of the potato farmers had medium to large farm size.

4.1.4 Annual family income

Annual family income of the farmers ranged form 80 to 310 thousand taka. The mean was 175.21 taka and standard deviation was 62.01. On the basis of annual family income, the respondents were categorized into three groups as shown in Table 4.5.

Table 4.5 Classification of potato farmers according to their annual family income

Categories	Annual family income ('000 ' taka)	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low income	Up to 120	19	24		
Medium income	121 to 250	53	66	175.21	62.01
High income	Above 250	8	10		
Total		80	100		

Data presented in a Table 4.5 that the highest proportion (66 percent) of the respondents had medium income that was followed by low (24 percent) and high (10 percent) income earners. Generally higher income gives an individual better status in the society. Therefore, the higher income increases the risk taking capacity of the farmers in potato cultivation.

4.1.5 Knowledge on potato cultivation

Computed scores of the farmers about Knowledge on potato cultivation ranged from 16 to 40 with a mean of 31.43 and standard deviation of 7.42. On the basis of Knowledge on potato cultivation, the respondents were classified into three categories as follows in Table 4.6.

Table 4.6 Classification of potato farmers according to their agricultural knowledge on potato cultivation

Categories	Scores	Potato farmers		Mean	Standard deviation
		Number	Percent		
Poor knowledge	Up to 25	21	26		
Moderate knowledge	26 to 38	49	61	31.43	7.42
High knowledge	Above 38	10	13		
Total		80	100		

Data contained in Table 4.6 show that most 61 percent of the farmers had a moderate knowledge compared to26 percent farmers had poor knowledge in potato cultivation as compared to only 13 percent having high knowledge respectively.

4.1.6 Extension contact

Computed extension contact score ranged from 11 to 24 with an average of 17.60 and standard deviation of 4.160. Based on the extension contact scores, the respondents were classified into the three categories shown in table 4.7.

Table 4.7 Classification of the potato farmers according to their nature of extension contact

Categories	Scores	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low extension contact	Up to12	18	22		
Medium extension contact	13 to 22	51	64	17.06	4.160
High extension contact	Above 22	11	14		
Total		80	100		

Data presented in table 4.7 indicate the highest proportion (64 percent) of the farmers had medium extension contact followed by low extension contact (22 percent) and high extension contact (14 percent).

The findings of this study indicated that the majority (78%) of the farmers in the study area had medium to high extension contact. It could be concluded that the extension contact or media of the study area were not so available to the respondents. So, to reduced the various constraints in potato cultivation of the farmers in the study area should be needed more extension agents or media to overcome their constraints faced in potato cultivation.

4.1.7 Social participation

Social participation scores of the respondents ranged from 0 to 11. The average score was 3.53 with a standard deviation of 3.43; the respondents were classified into the following four categories as shown in Table 4.8.

Table 4.8 Classification of the potato farmers according to their social participation

Categories	Scores	Potato farmers		Mean	Standard deviation
		Number	Percent		
No participation	0	15	19		
Low participation	1 to 6	48	60		
Medium participation	7 to 10	13	16	3.53	3.43
High participation	Above 10	4	5		
Total		80	100		

Data presented in Table 4.8 indicate that most 60 percent of the respondents had low participation against 19 percent of the respondents who did not participate in any social organization, 16 percent had medium social participation and 5 percent had high participated in various social organizations.

Participation in different organization helps to know his present situation. It also helps him to how overcome the various constraints and other new ideas relating to different agricultural aspects. Social participation may, therefore, enable the farmers to overcome of their constraints in potato cultivation effectively. The findings of this study indicate that a large proportion (60 percent) of the farmers had low participation in organization and 19 percent had no participation at all.

4.2 Constraints faced by the farmers in potato cultivation

Constraints in potato cultivation faced by the farmers was the depended variable of this research work. The constraints faced by the farmers in six selected dimensions of potato cultivation namely use of quality seed, fertilizers, irrigation, potato preservation, potato marketing and agricultural credit use were measured. For having a clear in depth understanding of the overall constraints faced by the farmers in potato cultivation, one needs to have an idea about his faced constraints in each of the six selected dimensions.

Constraints faced by the farmers in selected dimensions of potato cultivation are described in the first six sections and the comparative constraints facing by the farmers are described in the next section.

4.2.1 Constraints faced in use of quality seed

Seed constraints score was computed to measure the extent of constraints faced by each farmer in using seed of potato. The possible scores of the respondents could range from 0 to 30. However, the observed scores ranged from 12 to 21 with an average of 17.16 and a standard deviation 2.59. Based on these scores the farmers were classified into three categories as shown in Table 4.9.

Table 4.9 Distribution of the potato farmers according to their constraints faced in use of quality seeds

Categories	Scores	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	1 to 12	4	5		
Medium constraints facing	13 to 19	57	71	17.16	2.59
High constraints facing	Above 19	19	24		
Total		80	100		

Analysis of the data contained in Table 4.9 indicates that the majority (71 percent) potato farmers had medium constraints facing compared to 24 percent having high constraints facing and 5 percent respondents had low constraints facing in use of quality seed in potato cultivation.

4.2.2 Constraints faced by the farmer in using fertilizers

Fertilizer use constraints scores of the respondents ranged from 11 to 23 against the possible range of 0 to 30. The average score was 17.31 with a standard deviation of 2.72. The classification of the farmers based on their fertilizer constraints scores is shown in the Table 4.10.

Table 4.10 Distribution of the potato farmers according to their constraints faced in use of fertilizers

Categories	Scores	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	1 to 12	1	1		
Medium constraints facing	13 to 19	61	76	17.31	2.17
High constraints facing	Above 19	18	23		
Total		80	100		

Data furnished in Table 4.10 revealed that the highest proportion (23 %) of the farmers faced high constraints compared to 1% faced low constraints and 76% faced medium constraints in potato cultivation. Importance of fertilizers in increasing potato production can hardly be over emphasized. But the findings indicate that farmers face medium to high level of constraints in using fertilizers.

4.2.3 Constraints Faced By the Farmers in using Irrigation

Possible irrigation constraints scores of the respondents could range from 0 to 30. However, the computed constraint scores of the respondents ranged from 10 to 25 with an average of 17.25 and a standard deviation of 3.68. Based on irrigation constraints scores, the respondents were classified into three categories as shown in Table 4.11.

Table 4.11 Distribution of the potato farmers according to their constraints faced in use of irrigation

Categories	Score	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low constraints	1 to 12	7	9		
Medium constraints	13 to 19	54	67	17.25	3.68
High constraints	20 to 30	19	24		
Total		80	100		

Data in Table 4.11 show that majority (67%) of the potato farmers had faced medium constraints compared to 24% farmers faced high constraints and only 9% farmers faced low constraints in potato cultivation.

4.2.4 Constraints faced by the farmers in potato preservation

The obtained preservation constraints scores ranged from 8 to 16 against the possible range of 0 to 18 with an average of 12.40 and a standard deviation of 2.51. Considering the constraints score regarding preservation the farmers were classified into three groups as shown in Table 4.12.

Table 4.12 Distribution of the potato farmers according to their constraints faced in potato preservation

Categories	Score	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low constraints	1 to 6	0	0		
Medium constraints	7 to 12	38	47	12.40	2.51
High constraints	Above 12	42	53		
Total		80	100		

Data in Table 4.12 show that majority of the potato farmers faced 53% high constraints compared to 47% faced medium constraints and there was none that faced

low constraints in potato preservation. So it was obvious that preservation is important for increasing the potato production. This finding indicated that all most all potato farmers faced high to medium constraints regarding potato preservation.

4.2.5 Constraints faced by the farmers in potato marketing

Constraints facing scores in marketing were computed to measure the extent of constraints faced by the potato farmers. T he computed scores of the respondents ranged from 4 to 9 against possible range 0 to 12 with a mean of 6.48 and standard deviation of 1.45. Based on the computed scores, the potato farmers were classified into three categories as shown in the following Table 4.13.

Table 4.13 Distribution of the potato farmers according to their constraints faced in potato marketing

Categories	Scores	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	1 to 4	10	12		
Medium constraints facing	5 to 8	63	79	6.48	1.45
High constraints facing	Above 8	7	9		
Total		80	100		

Data furnished in above Table 4.13 indicates that the majority 79 percent of the potato farmers had medium constraints facing compared to 9 percent having high constraints facing and 12 percent respondents had low constraints facing in marketing of potato. Some regulations of marketing eliminated the middle men and hindrances in marketing of this crop

4.2.6 Constraints faced by the farmers in using agricultural credit

A few numbers of farmers did not take any agricultural credit. Rest of farmers constraints facing scores in agricultural credit were computed to measure the extent of constraints faced by the potato farmers in potato field. However, the computed

scores of the respondents among the farmers which have taken agricultural credit ranged from 0 to18 against possible range 0 to 21 with a mean of 10.84 and standard deviation of 4.67. Based on the computed scores, the potato farmers were classified into four categories as shown in the following Table 4.14

Table 4.14 Classification of the potato farmers according to their constraints faced in use of agricultural credit

Categories	Scores	Potato farmers		Mean	Standard deviation
		Number	Percent		
Low constraints facing	1 to 7	18	23		
Medium constraints facing	8 to 14	27	44		
High constraints facing	Above14	35	27	10.84	4.669
Did not take credit	O	5	6		
Total		80	100		

Data furnished in above Table 4.14 indicates that the majority 44 percent of the potato farmers had medium constraints facing compared to 27 percent having high constraints facing, 23 percent farmers had low constraints facing in agricultural credit and 6 percent farmers did not take any agricultural credit in cultivation of potato.

4.3 Comparative Constraints Facing Index of farmers in six selected Dimensions of potato cultivation

Comparative constraints facing index of farmers in six selected dimensions of potato cultivation were investigated in this study. It was considered necessary to have an understanding about the nature of constraints facing by the farmers in these different dimensions, namely use of quality seed, use of fertilizers, use of irrigation, potato preservation, potato marketing and use of agricultural credit. For this purpose, a Constraint Facing Index (CFI) was computed for each of the six dimensions by using the following formula as used by Mansur (1989) and Raha (1989).

Constraint Facing Index (CFI) = P_l x 1 + P_m x 2 + P_h x 3

Where, P_l = Percentage of farmers having low constraint facing

P_m = Percentage of farmers having medium constraint facing

P_h = Percentage of farmers having high constraint facing

Percent of the respondents facing low, medium and high constraints were described earlier in 4.2.1 to 4.2.6 sections. Constraint Facing Index (CFI) for any one of the selected dimensions could range from 100 to 300 where 100 indicated low constraint facing and 300 indicated high constraint facing. However, Constraint Facing Index for the six selected dimensions of potato cultivation ranged from 192 to 253. Comparative rank orders of the six selected dimensions have been shown in Table 4.15 on the basis of their Constraint Facing Index (CFI).

Table 4.15 Rank order of six selected dimensions of potato cultivation according to their CFI

Dimensions of potato cultivation	Constraints facing index (CFI)	Rank order
Potato preservation	253	1
Use of fertilizer	222	2
Use of quality Seed	219	3
Use of irrigation	215	4
Potato marketing	197	5
Use of agricultural credit	192	6

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The CFI in the Table 4.15 indicates that the farmers faced highest constraint in potato preservation (CFI = 253). This was followed by constraints in fertilizers (CFI=222), quality seed (CFI= 219), irrigation (CFI= 215), potato marketing (CFI=197) and agricultural credit (CFI= 192).

Extent of constraint facing of the farmers in six selected dimensions of potato cultivation has been diagrammatically shown in figure 4.1.
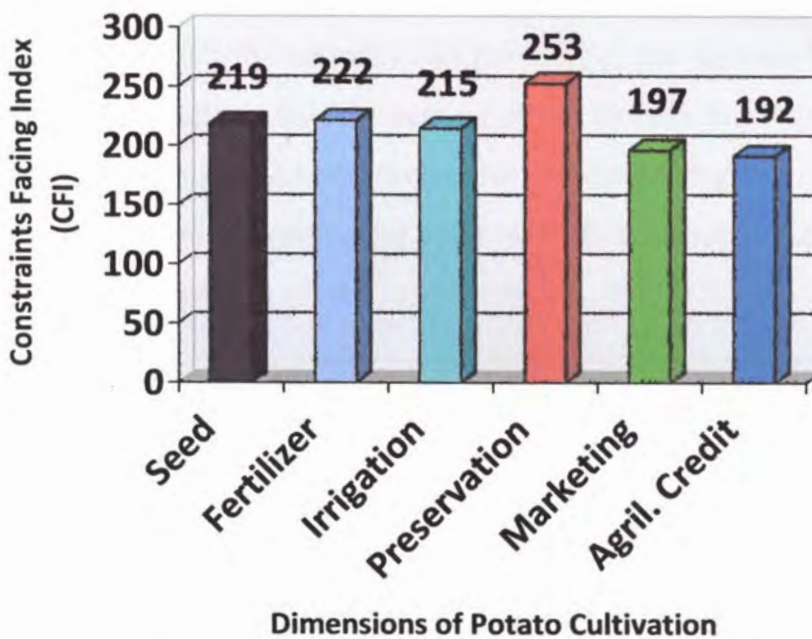
Figure 4.1 Constraint Facing Index by the farmers in six selected dimensions in potato cultivation

4.4 Overall constraints facing in potato cultivation

The computed overall constraint facing scores of the farmers ranged form 50 to 110 against the possible range 0 to 141. The average score was 81.44 and standard deviation was 13.09. Based on the overall constraint facing scores, the farmers were classified into three categories shown in the following Table 4.16.

Table 4.16 Classification of farmers according to their overall constraints

faced in potato cultivation

Categories	Scores	Potato farmers		Mean	Standard
		Number	Percent		deviation
Low constraints facing	Up to 65	11	14		
Medium constraints facing	66 to 90	50	62	81.44	13.09
High constraints facing	Above 90	19	24		
Total		80	100		

The Table 4.16 indicated that the majority (62 percent) of the farmers faced medium constraints in potato cultivation while 24 percent of the farmers faced high constraint. Comparatively few farmers (14 percent) faced low constraints in potato cultivation. Distribution of the farmers according to their overall constraint facing has been visually presented in figure 4.2.
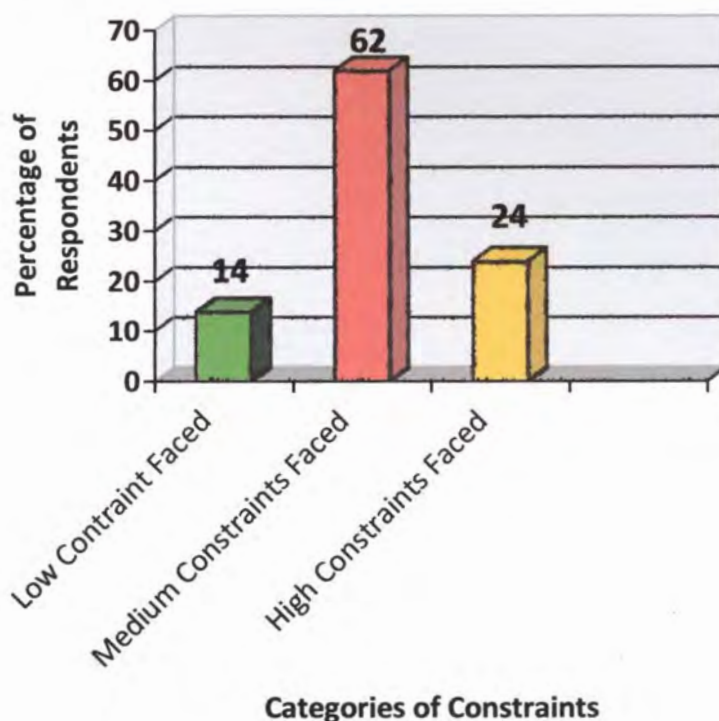
Figure 4.2 Distributions of potato farmers according to their overall constraint faced in potato cultivation

It is a common observation that the greater is the constraint faced by an individual in any work, the lesser is his progress in that work. It is, therefore, likely that farmers' constraints facing in potato cultivation will have adverse effect in their progress in potato cultivation as well as in agricultural production. The findings of this study indicate that only 14 percent farmers faced low constraints in potato cultivation. Average of the scores of grower's constraint facing potato cultivation was medium (62 percent). But the highest proportion of the farmers (86 percent) faced medium to high level of constraints. These facts indicated that the desired level of potato production would not be achieved if the different constraints faced by the farmers were not tackled by the concerned authority.

4.5 Relationship of the selected characteristics of the farmers with their constraints faced in potato cultivation

Co-efficient of correlation was computed in order to explore the relationship between the selected characteristics of the potato farmers and their constraints faced in potato cultivation were sown in Table 4.17

Table 4.17 Results of the correlation analysis between the selected characteristics of the farmers and their overall constraints faced in potato cultivation N=80

Dependent variable	Independent variables (Farmers characteristics)	Values of 'r' with 78 df	Table value of 'r'	
			at 0.05 level	at 0.01 level
Constraints faced by the farmers in potato cultivation	Age	0.017 NS	0.221	0.286
	Education	-0.564**		
	Farm size	-0.541**		
	Annual family income	-0.480**		
	Knowledge on potato cultivation	-0.580**		
	Extension contact	-0.525**		
	Social participation	-0.552**		

NS = not significant

*= Significant at 0.05 level of probability

**= Significant at 0.01 level of probability

4.6.1 Relationship between age of the farmers and overall constraints faced in potato cultivation

Computed value of the coefficient of correlation between age of the farmers and overall constraints faced in potato cultivation was found to be 0.017 as shown in Table 4.17. The following observations on the basis computed value of 'r' were made:

Firstly, a positive relationship was found to exist between the concerned variables. Secondly, the computed value of 'r' ('r'= 0.017) was found to be smaller than the table value ('r'=+0.221) with 78 degrees of freedom at 0.05 level of probability. Thus, statistically the relationship was not significant.

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

4.6.2 Relationship between education of the farmers and overall constraints faced in potato cultivation

Computed value of the coefficient of correlation between education of the farmers and overall constraints faced in potato cultivation was found to be -0.564 as shown in Table 4.17. The following observations on the basis computed value of 'r' were made :

Firstly, a negative relationship was found to exist between the concerned variables. Secondly, the computed value of 'r' ('r'= -0.564) was found to be larger than the table value ('r'= +0.368) with 78 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between education of the farmers and overall constraints in potato cultivation. It was concluded that higher the education level of the potato farmers, lower was there constraints faced in potato cultivation.

4.6.3 Relationship between farm size of the farmers and overall constraints faced in potato cultivation

Computed value of the coefficient of correlation between farm size of the farmers and overall constraints in potato cultivation was found to be -0.541 as shown in Table 4.17 The following observations on the basis computed value of 'r' were made :

Firstly, a negative relationship was found to exist between the concerned variables. Secondly, the computed value of 'r' ('r'= -0.541) was found to be larger than the table value ('r'+=0.368) with 78 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between farm size of the farmers and overall constraints in potato cultivation. It was concluded that higher the farm size of the farmers, lower was their constraints faced in potato cultivation.

4.6.4 Relationship between annual family income of the farmers and overall constraints faced in potato cultivation

Computed value of the coefficient of correlation between annual family income of the farmers and overall constraints in potato cultivation was found to be -0.480 as shown in Table 4.17. The following observations on the basis computed value of 'r' were made:

Firstly, a negative relationship was found to exist between the concerned variables. Secondly, the computed value of 'r' ('r'= -0.480) was found to be larger than the table value ('r'=+0.368) with 78 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between annual family income of the farmers and overall constraints in potato cultivation. This indicated that higher the annual family income of the farmers, lower was their constraints face in respect of potato cultivation.

4.6.5 Relationship between knowledge on potato cultivation of the farmers and overall constraints faced in potato cultivation

Computed value of the coefficient of correlation between Knowledge on potato cultivation of the farmers and overall constraints in potato cultivation was found to be -0.580 as shown in Table 4.17 The following observations on the basis computed value of 'r' were made :

Firstly, a negative relationship was found to exist between the concerned variables. Secondly, the computed value of 'r' ('r'= -0.580) was found to be larger than the table value ('r'=+0.368) with 78 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between Knowledge on potato cultivation of the farmers and overall constraints in potato cultivation. This indicated that the farmers who has more agricultural knowledge, they faced lower constraints in respect of their potato cultivation.

4.6.6 Relationship between Extension Contact of the Farmers and overall constraints faced in potato cultivation

Computed value of the coefficient of correlation between extension contact of the farmers and overall constraints in potato cultivation was found to be -0.525 as shown in Table 4.17. The following observations on the basis computed value of 'r' were made:

Firstly, a negative relationship was found to exist between the concerned variables. Secondly, the computed value of 'r' ('r'= -0.525) was found to be larger than the table value ('r'=+0.368) with 78 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between extension contact of the farmers and overall constraints in potato cultivation. This indicated that the farmers who had higher extension contact, they faced lower constraints in respect of potato cultivation.

4.6.7 Relationship between social participation of the farmers and overall constraints faced in potato cultivation

Computed value of the coefficient of correlation between social participation of the farmers and overall constraints in potato cultivation was found to be -0.552 as shown in Table 4.17 The following observations on the basis computed value of 'r' were made:

Firstly, a negative relationship was found to exist between the concerned variables. Secondly, the computed value of 'r' ('r'= -0.552) was found to be larger than the table value ('r'=+0.368) with 78 degrees of freedom at 0.01 level of probability. Thus, statistically the relationship was significant at 0.01 level.

Based on the above findings, the null hypothesis was rejected and hence, the investigator concluded that there was significant negative relationship between social participation of the farmers and overall constraints in potato cultivation. This indicated that social participation is an important factor of the farmers in decreasing their constraints faced in potato cultivation. So the farmers who had higher social participation, they faced lower constraints in potato cultivation.

Chapter V

Summary of Findings, Conclusions and Recommendations

Chapter V

Summary of Findings, Conclusions and Recommendations

This chapter presented the summary of the findings, conclusions and recommendations of the study

5.1 Summary of findings

5.1.1 Constraints faced by the farmers in potato cultivation

Findings in respect of constraints faced by the farmers in each of the six dimensions of potato cultivation, comparative constraints facing among the six selected dimensions of potato cultivation and farmers' overall constraints in potato cultivation are summarized below:

Constraints in use of quality seed

Quality seed score constraints of farmers range from 12 to 21 with an average of 17.13 and the standard deviation was 2.59. The majority (71 percent) of the farmers faced medium constraint in respect of use of quality seed compared to 24 percent faced high constraints and only 5% faced low constraints in use of quality seed in potato cultivation.

Constraints faced in use of fertilizer

Constraints in fertilizers use score range from 11 to 23 with an average of 17.31 and standard deviation was 2.72. The majority (76 percent) of the farmers faced medium constraint in respect of use of fertilizer, compared to 23 percent faced high constraints and only 1 percent faced low constraints in respect of use of fertilizers in potato cultivation.

Constraints faced in use of irrigation

Constraints in use of irrigation score range from 10 to 25 with an average of 17.25 and standard deviation was 3.68. The majority (67%) of the potato farmers faced medium constraint in respect of use of irrigation, compared to 24% faced high constraints and only 9% faced low constraints in respect of use of irrigation in potato cultivation.

Constraints faced in potato preservation

The potato preservation constraints score range from 8 to 16 with an average of 12.40 and standard deviation was 2.51. More than half (53%) of the farmers faced high constraints in respect of potato preservation, compared to 47% faced medium constraints and there was no farmers faced low constraints in respect of potato preservation in potato cultivation.

Constraints faced in potato marketing

Constraints in potato marketing score range from 4 to 9 with an average of 6.47 and standard deviation was1.45. Constraints facing in marketing had shown that the majority (79 percent) of the potato farmers faced medium constraints in the respect of potato marketing while 9 percent faced high constraints and only 12 percent faced low constraints in respect of potato marketing.

Constraints faced in use of agricultural credit

Use of agricultural credit constraints score ranged from 0 to 14 with an average of 10.83 and standard deviation was 4.66. The majority (44 percent) of the farmers faced medium constraint in respect of credit, compared to 27 percent faced high constraints, 23 percent faced low constraints in respect of use of agricultural credit and 6 percent did not take any credit.

5.1.2. Comparative Constraints Facing Index in six selected dimensions of potato cultivation

In order to compare the constraints faced by the farmers in six selected dimensions of potato cultivation, a Constraint Facing Index (CFI) was computed for each dimension. Constraint facing index of the six selected dimensions ranged from 193 to 253 against the possible range of 100 to 300. Farmers faced highest constraints in potato preservation as indicated by its CFI of 253; then CFI of fertilizer, seed irrigation, potato marketing and agricultural credit were 222, 219, 215, 197 and 192 respectively.

5.1.3. Overall constraints faced by the farmers in potato cultivation

For having an understanding of the comprehensive constraints of the farmers in the six selected dimensions of potato cultivation, an overall constraint facing score was computed for each respondent by adding and then converting to percentage of the scores in the six selected dimensions of potato cultivation. Constraints in overall potato cultivation score; the observed range from 50 to 110 with an average of 81.43 and standard deviation was 13.09. A great majority (62 percent) of the farmers had medium constraints faced, while 24 percent of the farmers faced high constraints and 14 percent farmers faced low constraints in potato cultivation.

5.1.4. Characteristics of the farmers

Seven characteristics of the farmers were selected for exploring their relationships with constraints faced by the farmers in potato cultivation. Findings in respect of the selected characteristics are summarized below:

Age

Age of farmers ranged from 24 to 55 years, the average being 38.03 years. More than half (63 percent) of the farmers fell in the middle aged category (35 to 50 years) compared to 31 percent falling in the young aged category (up to 34 years) and 6 percent in old aged category (above 50 years).

Education

Education of the farmers ranged form illiteracy to 14 years schooling, the average being 5.875 years of schooling. 14 percent illiterate while, 38 percent of the farmers had secondary level education and 34 percent of the farmers had primary level education and 14 percent of the farmers had above secondary level education.

Farm size

Farm size of the respondents ranged from 0.62 to 3.75 hectares. The average farm size was found to be 2.08 hectares. Highest proportion (86 percent) of the farmers had medium farm (1.1 to 3 hectare) compared to 8 percent of small farm (up to 1 hectares) and only 6 percent of large farm size (above 3 hectares).

Annual family income

Annual family income of the farmers ranged from Take 80000 to 310,000.00 with an average of Taka 175212. It was observed that 24 percent of the farmers had low income (up to 120,000.00 per year) compared to 66 percent of the farmers having medium annual family income (Tk.121,000.00 to Tk. 250,000.00 per year) and 10 percent of the farmers having high annual family income (above Tk.250,000.00 per year).

Knowledge on potato cultivation

Scores for knowledge of the farmers in potato cultivation ranged from 16 to 40 against the possible range of 0 to 50 score, the average being 31.43 score. Most 61 percent of the farmers had medium knowledge (61 percent) and 26 percent had poor knowledge, only 13 percent had high knowledge.

Extension contact

Computed extension contact scores ranged from 11 to 24 with an average 17.60. Maximum, 64 percent farmers had medium extension contact followed by 22 percent had low extension contact and 14 percent had high extension contact.

Social participation

Social participation scores of the respondents ranged from 0 to 11, the average being 3.53. Data analysis showed that 19 percent farmers were not participated any organization, compared to 60 percent had low participation, 16 percent had medium participation and only 5 percent had high participation.

5.1.5. Relationship between constraints faced by the farmers in potato cultivation with their selected characteristics

Age and constraints faced in potato cultivation

There was no significant relationship between the age of the farmers and their overall constraints faced in potato cultivation, but a positive trend were found between the two variables.

Education and constraints faced in potato cultivation

There was a significant negative relationship between the education of the farmers and their overall constraints faced in potato cultivation at 0.01 level of probability.

Farm size and constraints faced in potato cultivation

There was a significant negative relationship between the farm size of the farmers and their overall constraints faced in potato cultivation at 0.01 level of probability.

Annual family income and constraints faced in potato cultivation

There was a significant negative relationship between the annual family income of the farmers and their overall constraints faced in potato cultivation at 0.01 level of probability.

Knowledge on potato cultivation and constraints faced in potato cultivation

There was a significant negative relationship between knowledge on potato cultivation of the farmers and their overall constraints faced in potato cultivation at 0.01 level of probability.

Extension contact and constraints faced in potato cultivation

There was a significant negative relationship between the extension contact of the farmers and their overall constraints faced in potato cultivation at 0.01 level of probability.

Social Participation and constraints faced in potato cultivation

There was a significant negative relationship between the social participation of the farmers and overall constraints faced in potato cultivation at 0.01 level of probability.

5.2 Conclusion

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

1. The study investigated the extent of constraints faced by the farmers in cultivating potato in six selected dimensions namely use of quality seed, use of recommended fertilizers, use of irrigation, potato preservation, potato marketing and use of agricultural credit in potato cultivation. The findings indicated that the farmers faced considerable constraints in all six dimensions of cultivating potato. The extent of constraints faced by the farmers in preservation of potato was the highest.

2. Education of the potato farmers had significant negative relationships with their overall constraints faced in all six dimensions of potato cultivation. This means that the higher the education level of the potato farmers, lower was their overall constraints faced in potato cultivation. Education helps an individual to get useful information to solve their various constraints through learning, knowing personal communication, receiving training, adopting new ideas etc. Literate persons will be able to solve their various constraints through reading leaflets, booklets, other Printed materials, etc. related to potato cultivation. So, education is a key factor for the potato farmers to overcome their constraints in potato cultivation. It may, therefore be concluded that a literacy programme will be very important in the study area.

3. The average farm size in the study area is usually medium. The findings indicate that a negative relationship between farm size of the potato farmers and their overall constraints in all dimensions of potato cultivation. In the context of Bangladesh, it is difficult to increase the farm size. However, the small farm owners with small income may be helped by different government organizations and NGOs to provide credit facilities for purchasing various inputs for production and overcome their constraints in potato cultivation.

4. Annual family income had significant negative relationships with their overall constraints faced in potato cultivation. This means that higher income of the potato farmers, lower was their overall constraints faced in potato cultivation. In view of the above facts it may be concluded that majority of the potato farmers will continue to face constraints unless steps are taken to help them to increase their income.

5. The findings indicated that knowledge on potato cultivation of the farmers had significant negative relationship with their overall constraints faced in potato cultivation. Knowledge on potato cultivation of the farmers helps them to understand the various complex and complicated issues of potato cultivation. Cultivation of potato requires a series of operations from its beginning until its harvesting. Each of the operations needs technical knowledge. Most 88 percent of the farmers were found to have low or poor knowledge on potato cultivation. So, majority of the farmers faced considerable constraints in potato cultivation.

6. The findings indicated that the farmers extension contact had significant negative relationship with their overall constraints faced in potato cultivation. This means that farmers when, have a higher extension contact, faced lower constraints in potato cultivation. This leads to the conclusion that increasing extension contact will give the farmers good opportunities to overcome their different constraints in potato cultivation.

7. Participation in various social organizations makes farmers aware of different development programmes which in turn becomes helpful to farmers to adjust own situation. The findings of this study revealed that majority (60%) of the respondents had low participated in some organization; only 16 % of them had medium participation and only 5% had high participation in different organizations. It was found that there is a strong negative relationship between the organizational participation of the farmers and their constraints in potato cultivation. This means that farmers who participate in different societies and

organizations had less constraints compared to those who had no or low participation. A farmer who generally does not participate in organizations or avoid meetings will probably not be able to know where the seeds, fertilizers, irrigation facilities, potato preservation, marketing facilities are available and how to overcome the constraints and how to get knowledge about potato cultivation. Therefore, it may be concluded that unless arrangements are made for increasing the social participation of the potato farmers their constraints in potato cultivation will not be reduced.

8. Regarding overall constraints faced by the potato farmers, 62 percent potato farmers faced medium, 24 percent potato farmers faced high and only 14 percent potato farmers faced low constraints in potato cultivation. Totally 86 percent farmers faced medium to high constraints in potato cultivation. From this fact, it may be concluded that until the potato farmers are free from different constraints in potato cultivation, they will not be in a position to adopt improved technology in potato production.

5.3 Recommendation

5.3.1. Recommendation for policy implication

On the basis of findings and conclusions, the following recommendations are drawn:

1. Potato is the principal vegetable crop in Bangladesh. Potato contributes an important role in the total vegetable cultivation in the country. However, the farmers in the study area faced the higher constraints in potato preservation. So, to reduce the constraints faced in potato preservation by the farmers, their potato preservation and cold storage facilities should be increased.

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

3. Farmers who are financially solvent can invest money to use quality seed, fertilizer, irrigation, potato preservation etc in time. The solvent farmers faced lower constraints than the poorer farmers. This study revealed that the low income farmers faced high constraints in cultivating potato. It has been observed that about 90% of the farmers had either low to medium annual family income and only 10% of them had high annual family income. Therefore, it is recommended that: a) arrangements should be made to supply the required inputs to the farmers at subsidized rate b) agricultural inputs should be made available locally. It may also be sold to the farmers on loan which may be pay basic on installments c) short term loan should be provided to the farmers in easy terms and conditions with a low interest rate at the beginning of potato season with a continuous supervision d) extension agencies can make an arrangement for homestead vegetable gardening.

4. Knowledge on potato cultivation plays a vital role in performing agricultural operations effectively and efficiently. It is therefore, recommended that arrangement should be made for providing proper Knowledge on potato cultivation

through training, tours, fair and exhibition, method demonstration, meeting at result demonstration and the like.

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

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

7. In addition to potato cultivation constraints, the farmers also face other constraints such as social, economic, and other domestic constraints. All these constraints affect the performance of the potato farmers. There is a need for undertaking researches in various constraints faced by them that affect their performance in potato cultivation.

5.3.2 Recommendations for Further Study

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

1. The present study conducted on the population of the potato farmers of ten villages of Jhikargacha upazila under Jessore district. Findings of the study need to be verified by undertaking similar research in other potato growing zones of the country.

2. This study investigated the relationships of seven selected characteristics of the farmers with their constraints faced in potato cultivation. But farmers' constraints in potato cultivation might be affected by various other personal, social, psychological, cultural and situational factors of the farmers. It is, therefore, recommended that further study should be conducted involving other characteristics in this regard.

3. The study investigated only six dimensions of potato cultivation. But it is required to investigate other dimensions of potato cultivation. Such as use of high yielding variety, intercultural operations, net return etc,

4. Relationship of seven characteristics of the farmers with their constraints faced in respect of cultivating potato was investigated. Further research may be undertaken for exploring relationships of other characteristics of the farmers with their constraints faced in potato cultivation.

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

6. All these constraints affect the performance of the farmers' potato production. There is a need for undertaking research on the various constraints faced by the farmers which affect their performance.

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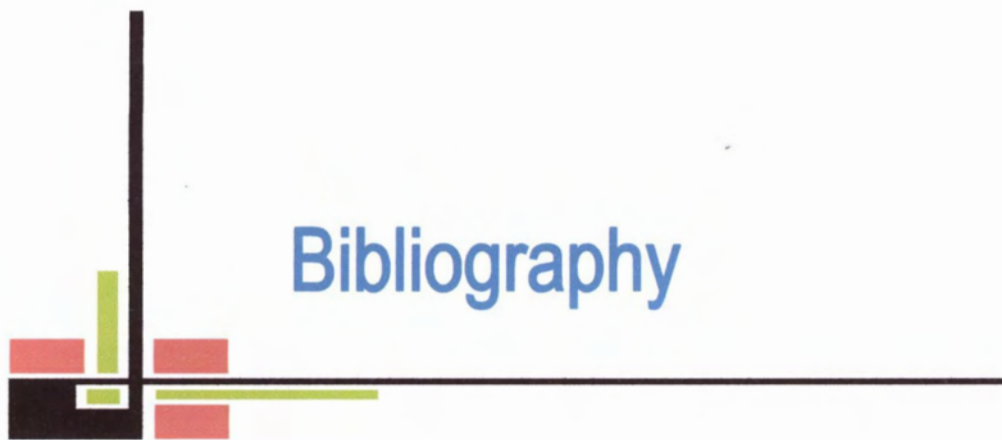
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Appendices

Department of Agricultural Extension and Information System

Sher-e- Bangla Agricultural University

Sher-e- Bangla Nagor, Dhaka-1207.

ENGLISH VERSION OF THE SINTERVIEW SCHEDULE FOR A RESEARCH STUDY ON

CONSTRAINTS FACED BY THE FARMERS IN POTATO CULTIVATION IN JHIKARGACHA UPAZILA UNDER JESSORE DISTRICT

Serial no..

Name of the respondent:..

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

Upazila....................... District..............................

(Please answer the following questions)

1. How old are you? ....Years

2. What is the level of your education?

      i) .... Do not know how to read and write

      ii) .... Do not know reading and writing, but can sign only

      iii) Up to the level of class ....Passed class/ Examination.

3. **Please furnish the following information regarding the area of your land according to use(all your information will be kept secrete)**

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

4. **Please mention your annual family income:**

SL. No.	Source of income	Amount of income(taka)
1	From other crops except potato	
2	Only from potato	
3	From cows, goats etc.	
4	From ducks, hens etc.	
5	From fisheries	
6	From service	
7	From business	
8	Others	
	Total	

5. **Please answer the following questions in connection with potato cultivation:**

SL. No.	Questions	Full score	Score obtained
1	What is the function of Urea in potato cultivation?	3	
2	What is the function of T.S.P in potato cultivation?	3	
3	What is the function of M.P in potato cultivation?	3	
4	What purpose of use cow dung in potato cultivation?	3	
5	What are the functions of good potato seeds?	2	
6	What do you mean by potato seed treatment?	3	
7	What is the seed rate of potato per bigha?	3	
8	What distance should be maintained from seed to seed of potato?	2	
9	Name of two improved varieties of potato.	2	
10	What is the optimum sowing time of potato seed?	3	
11	Name of two diseases of potato	2	
12	What are the symptoms of late blight disease of potato?	2	
13	Name two insects of potato.	2	
14	What are the ways of preserving potato seeds?	3	
15	Name two fungicides for the control of potato late blight.	2	
16	When irrigation is needed in potato cultivation?	3	
17	What kind of soil is suitable for potato cultivation?	2	
18	When earthing-up is needed in potato cultivation?	2	
19	Why the water hyacinth is used in potato cultivation?	3	
20	What the fogs and small rain are harmful to potato cultivation?	2	
	Total	50	

6. Please mention your nature of participation (past or present) in the following social organization (Tick in right place)

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

7. Please mention your nature of extension contact with the following media of information (Tick in right place)

Sl. No.	Extension personnel	Nature of extension contact				
		Regularly	Often	Occasionally	Rarely	Not at All
1	Upazila Agricultural Officer					
2	Agricultural extension officer					
3	Assistant agricultural extension officer					
4	Potato growing farmers					
5	Dealers (fertilizer, pesticides etc.)					
6	Experienced farmers/neighbors					
7	Radio/Television					
8	Result demonstration					
	Total					

8. a) Please indicate the extent of constraints faced by you in use of quality seed in potato cultivation (Tick in right place)

SL. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Non availability of improved seed				
2	Inability to purchase for high price of improved seed				
3	Long distance for seed collecting				
4	Low germination percentage of improved seed				
5	Non availability of quality seeds due to partially to the powerful persons				
6	Non availability of advices from extension workers about improved seed in time				
7	Impurity of the seed obtained from BADC				
8	Non availability of printed materials about improved seed				
9	Long time consumption in plant life cycle of improved seed				
10	Improved seed preserved for a long time is not possible in local process				
	Total				

8. b) Please indicate the extent of hindrance caused by you in using fertilizer in respect of Potato cultivation (Tick in right place)

Sl. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Non availability of fertilizer in time				
2	Inability to purchase fertilizer at high cost				
3	Lack of training about fertilizer use				
4	Doubt about the effectiveness of the fertilizer				
5	Excessive insect attack due to fertilizer use				
6	Deteriorating land due to fertilizer use				
7	Difficulties in fertilizer due to lack of irrigation				
8	Lack of knowledge about time of fertilizer use				
9	Adulteration of fertilizers				
10	Lack of facilities for observing result demonstration about positive effect of fertilizer use				
	Total				

8.c) Please indicate the extent of constraints faced by you in applying irrigation in respect of potato cultivation(Tick in right place)

Sl. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Non-availability of irrigation facilities in time				
2	Lack of machinery for applying irrigation				
3	Lack of water source				
4	Presence of village factions				
5	Improper water distribution due to earthen drain				
6	Increase of fuel cost				
7	Facing frequent repairing cost				
8	Getting no advice from extension workers				
9	Lack of sufficient tube well mechanics				
10	Lack of work shop in locally for repairing the spare parts				
	Total				

8. d) Indicate the extent of constraints faced by you in potato preservation (Tick in right place).

S.L. No.	Constraints	Extent of constraints			
		Very High	High	Little	Not at all
1	Lack of cold storage to preserve potato				
2	Lack of training to preserve potato by local process				
3	Non availability of printed materials about potato preservation				
4	Decrease of potato weight when potato preserve for a long time				
5	Attack of fungal disease when potato is preserved by local process				
6	Lack of necessary advices from extension worker to preserve potato				
	Total				

8. e) Indicate the extent of constraints faced by you in potato marketing(Tick in right place)

S.L. No.	Constraints	Extent of constraints			
		Very High	High	Little	Not at all
1	Inadequate potato purchaser				
2	Transport problem in potato marketing				
3	Transport problem because long distance of market area				
4	Getting low price due to early selling of potato				
	Total				

8. f) Indicate the extent of constraints faced by you in credit use in respect of potato cultivation (Tick in right place)

S.L. No.	Constraints	Nature of constraints			
		Very high	High	Little	Not at all
1	Not availability of credit in time				
2	Interest of loan is too high				
3	Using middle man to get loan				
4	Bribes to corrupt officials				
5	Inadequacy of credit against in the demand				
6	Complex formalities				
07	Long distance from Thana Head Quarters				
	Total				

Thank you very much for your cordial cooperation

Date: ………………..

………………………………

Signature of the interviewer

APPENDIX B

Correlation Matrix of Dependent and Independent Variables

VARIABLE	X1	X2	X3	X4	X5	X6	X7	Y1	Y2	Y3	Y4	Y5	Y6	Y
X1	1													
X2	.061 NS	1												
X3	-.028 NS	.431**	1											
X4	.037 NS	.369**	.539**	1										
X5	.218 NS	.578**	.420**	.342**	1									
X6	.061 NS	.417**	.331**	.429**	.442***	1								
X7	.162 NS	.624**	.485**	.379**	.499**	.229*	1							
Y1	.035 NS	-.474**	-.440**	-.370**	-.424**	-.244*	-.699**	1						
Y2	.016 NS	-.458**	-.353**	-.451**	-.391**	-.381**	-.432**	.629**	1					
Y3	.084 NS	-.366**	-.436**	-.351**	-.383**	-.321**	-.348**	.591**	.529**	1				
Y4	-.059 NS	-.442**	-.426**	-.432**	-.708**	-.658**	-.357**	.385**	.340**	.484**	1			
Y5	.139 NS	-.389**	-.397**	-.273*	-.287**	-.233*	-.320**	.602**	.402**	.580**	.389**	1		
Y6	-.058 NS	-.405**	-.371**	-.284*	-.391**	-.436**	-.342**	.428**	.298**	.397**	.466**	.371**	1	
Y	.017 NS	-.564**	-.541**	-.480**	-.580**	-.525**	-.552**	.788**	.697**	.807**	.684**	.683**	.745*	1

NS = Not Significant
* = Correlation is significant at the 0.05 level (2-tailed).
** = Correlation is significant at the 0.01 level (2-tailed).

X1 = Age
X2 = Education
X3 = Farm size
X4 = Annual family income
X5 = Knowledge on potato cultivation
X6 = Extension contact
X7 = Social participation

Y1 = Use of quality seed constraints
Y2 = Use of fertilizers constraints
Y3 = Use of irrigation constraints
Y4 = Potato preservation constraints
Y5 = Potato marketing constraints
Y6 = Use of Agricultural credit constraints
Y = Overall constraints