

**YIELD PERFORMANCE OF SWEET POTATO CULTIVATION
AT FARMERS' FIELD**

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**YIELD PERFORMANCE OF SWEET POTATO CULTIVATION
AT FARMERS' FIELD**

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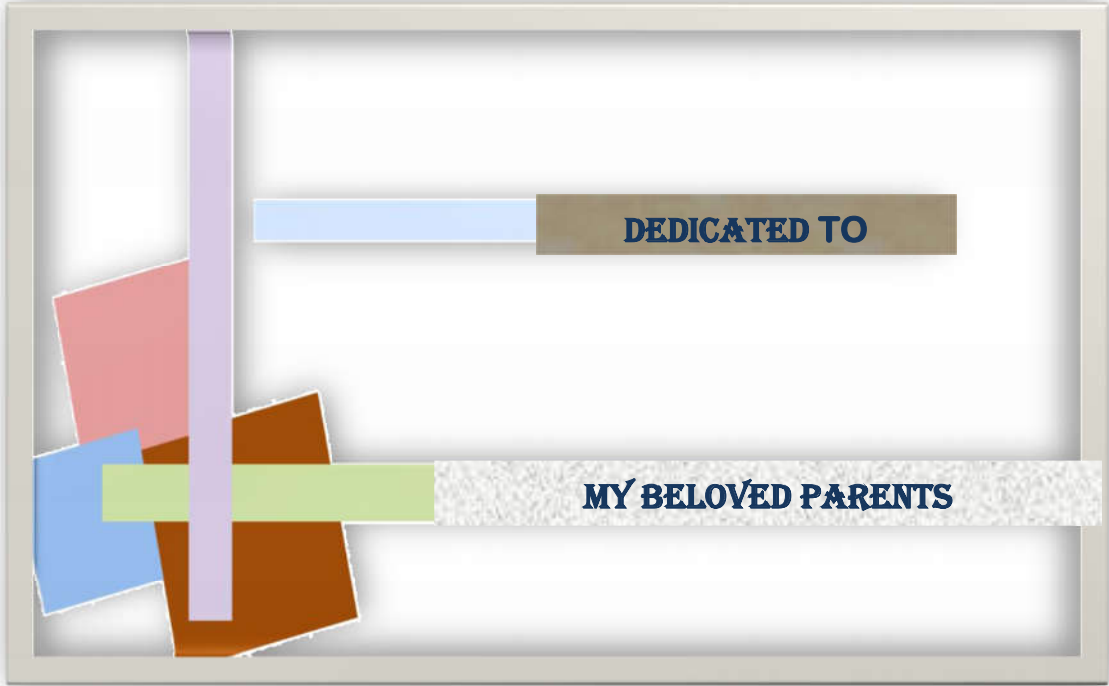
This is to certify that thesis entitled, “**YIELD PERFORMANCE OF SWEET POTATO CULTIVATION AT FARMERS FIELD**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in Agricultural Extension**, embodies the result of a piece of *bona fide* research work carried out by **MD. RAFEZ AHMED, Reg. No. 11-04419** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma in any institute.

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

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LIST OF CONTENTS

| CHAPTER | TITLE | Page |
|--|---|-------|
| | ACKNOWLEDGEMENT | i-ii |
| | TABLE OF CONTENTS | iii-v |
| | LIST OF TABLES | vi |
| | LIST OF FIGURES | vii |
| | LIST OF APPENDICES | vii |
| | ABBREVIATIONS | viii |
| | ABSTRACT | ix |
| CHAPTER I INTRODUCTION 1-9 | | |
| 1.1 | General Background of the Study | 1 |
| 1.2 | Statement of Problem | 4 |
| 1.3 | Specific Objective of the Study | 5 |
| 1.4 | Justification of the Study | 6 |
| 1.5 | Assumptions of the Study | 6 |
| 1.6 | Limitation and Scope of the Study | 7 |
| 1.7 | Definition of Terms | 8 |
| CHAPTER II REVIEW OF LITERATURE 10-15 | | |
| 2.1 | Concept of Performance | 10 |
| 2.2 | Review of Literature Related to Relationship between Different Characteristics of sweet potato farmers' and Yield Performance | 11 |
| 2.2.1 | Age and Yield performance | 11 |
| 2.2.2 | Level of education and Yield performance | 12 |
| 2.2.3 | Family size and performance | 13 |
| 2.2.4 | Land under sweet potato cultivation and Yield performance | 13 |
| 2.2.5 | Training exposure and Yield performance | 13 |
| 2.2.6 | Cosmopolitaness and Yield performance | 14 |
| 2.2.7 | Benefit cost ratio and Yield performance | 14 |
| 2.2.8 | Commercialization and Yield performance | 14 |
| 2.2.9 | Extension media contact and Yield performance | 14 |
| 2.2.10 | Knowledge and Yield performance | 15 |
| 2.2.11 | Problem faced and Yield performance | 15 |
| 2.3 | Research gap of the study | 15 |
| 2.4 | Conceptual Framework of the Study | 16 |
| CHAPTER III METHODOLOGY 17-29 | | |
| 3.1 | Locale of the Study | 17 |
| 3.2 | Population and sampling procedure | 17 |
| 3.3 | Data collection instrument | 22 |
| 3.4 | Selection of Variables | 22 |
| 3.5 | Measurement of Variables | 23 |
| 3.5.1 | Age | 23 |
| 3.5.2 | Level of education | 23 |

| | | |
|-------------------|---|--------------|
| 3.5.3 | Family Size | 23 |
| 3.5.4 | Land under sweet potato cultivation | 23 |
| 3.5.5 | Training Exposure | 24 |
| 3.5.6 | Cosmopolitaness | 24 |
| 3.5.7 | Benefit cost ratio | 24 |
| 3.5.8 | Commercialization | 25 |
| 3.5.9 | Extension media Contact | 25 |
| 3.5.10 | Knowledge on Sweet potato cultivation | 26 |
| 3.5.11 | Problems faced in sweet potato cultivation | 26 |
| 3.5.12 | Yield Performance of sweet potato cultivation | 27 |
| 3.6 | Statement of Hypothesis | 27 |
| 3.7 | Collection of Data | 28 |
| 3.8 | Data Analysis Procedure | 28 |
| | | |
| CHAPTER IV | RESULTS AND DISCUSSION | 30-48 |
| 4.1 | Characteristics of the sweet potato farmers | 30 |
| 4.1.1 | Age | 31 |
| 4.1.2 | Level of education | 32 |
| 4.1.3 | Family Size | 33 |
| 4.1.4 | Land under sweet potato cultivation | 33 |
| 4.1.5 | Training exposure | 34 |
| 4.1.6 | Cosmopolitaness | 35 |
| 4.1.7 | Benefit cost ratio | 35 |
| 4.1.8 | Commercialization of sweet potato cultivation | 36 |
| 4.1.9 | Extension media contact | 37 |
| 4.1.10 | Sweet potato cultivation knowledge | 37 |
| 4.1.11 | Problem faced in sweet potato cultivations | 38 |
| 4.2 | Performance of Sweet potato at farmers field | 39 |
| 4.3 | Relationships between the selected characteristics of the farmers and their performance of sweet potato cultivation | 39 |
| 4.3.1 | Age and their performance of sweet potato cultivation | 41 |
| 4.3.2 | Education and their performance of sweet potato cultivation | 41 |
| 4.3.3 | Family size and their performance of sweet potato cultivation | 41 |
| 4.3.4 | Land under sweet potato cultivation and their performance of sweet potato cultivation | 42 |
| 4.3.5 | Training and their performance of sweet potato cultivation | 42 |
| 4.3.6 | Cosmopolitanenes and their performance of sweet potato cultivation | 43 |
| 4.3.7 | Benefit cost ratio and their performance on sweet potato cultivation | 43 |
| 4.3.8 | Commercialization and their performance on sweet potato cultivation | 44 |
| 4.3.9 | Extension contact and their performance of sweet potato | 44 |

| | | |
|------------------|--|--------------|
| | cultivation | |
| 4.3.10 | Knowledge on sweet potato cultivation and their performance of sweet potato cultivation | 45 |
| 4.3.11 | Problems faced in sweet potato cultivation and their performance on sweet potato cultivation | 45 |
| 4.4 | Comparative severity among the Problems faced by the farmers in sweet potato cultivation | 46 |
| 4.5 | Compare the Yield performance of different sweet potato varieties | 48 |
| | | |
| CHAPTER V | SUMMARY, CONCLUSIONS AND RECOMMENDATIONS | 49-54 |
| 5.1 | Major Findings | 49 |
| 5.1.1 | Selected characteristics of the farmers | 49 |
| 5.1.2 | Yield Performance of different sweet potato varieties | 50 |
| 5.1.3 | Relationship between selected characteristics of the farmers and performance of different sweet potato varieties | 51 |
| 5.1.4 | Comparative severity among the problems faced by the farmers in sweet potato cultivation | 51 |
| 5.1.5 | Compare the Yield Performance of different sweet potato varieties | 51 |
| 5.2 | Conclusions | 51 |
| 5.3 | Recommendations | 53 |
| 5.3.1 | Recommendations for policy implications | 53 |
| 5.3.2 | Recommendations for the further study | 54 |
| | | |
| | REFERENCES | 56 |
| | APPENDIX | 60 |

LIST OF TABLES

| TABLE | TITLE | PAGE |
|-------|--|------|
| 1.1 | Sweet potato production in Bangladesh | 3 |
| 3.1 | Distribution of population and sample | 22 |
| 4.1 | Characteristics profile of the respondents | 31 |
| 4.2 | Distribution of the farmers according to their age | 32 |
| 4.3 | Distribution of the farmers according to their level of education | 32 |
| 4.4 | Distribution of the respondents according to their family size | 33 |
| 4.5 | Distribution of the sweet potato growers according to their land under sweet potato cultivation | 34 |
| 4.6 | Distribution of the farmers according to their training exposure | 34 |
| 4.7 | Distribution of the farmers according to their cosmopolitanenes | 35 |
| 4.8 | Distribution of the respondents according to their benefit cost ratio | 36 |
| 4.9 | Distribution of the respondents according to their commercialization | 36 |
| 4.10 | Distribution of the farmers according to their extension contact | 37 |
| 4.11 | Distribution of the respondents according to their knowledge on sweet potato cultivation | 38 |
| 4.12 | Distribution of the respondents according to their problem | 38 |
| 4.13 | Distribution of the respondents according to their performance | 39 |
| 4.14 | Co-efficient of correlation showing relationship between selected characteristics of the farmers and their Yield Performance of sweet potato cultivation | 41 |
| 4.15 | Problem Faced Index (PFI) with Rank Order | 47 |
| 4.16 | Compare the Yield Performance of different sweet potato varieties | 48 |

LIST OF FIGURES

| FIGURE | TITLE | Page No |
|---------------|---|----------------|
| 1.1 | Sweet potato production trends in Bangladesh | 2 |
| 2.1 | The conceptual framework of the study | 16 |
| 3.1 | A map of Shibgonj upazila under Bogura districts showing study area | 18 |
| 3.2 | A map of Gobindogonj upazila under Gaibandha upazila showing the study area | 19 |
| 3.3 | A map of Sherpur sadar upazila showing the study area | 20 |
| 3.4 | A map of Bhedargonj upazila under Shariatpur districts showing study area | 21 |

LIST OF APPENDICES

| APPENDIX | TITLE | Page No |
|-----------------|--|----------------|
| APPENDIX-I | An English Version of the Interview Schedule on “YIELD PERFORMANCE OF SWEET POTATO CULTIVATION AT FARMERS FIELD” | 60-64 |
| APPENDIX-II | Correlations between dependent and independent variables of the study | 65 |

ABBREVIATIONS USED

| | |
|------|---|
| GDP | Gross Domestic Product |
| BBS | Bangladesh Bureau of Statistics |
| USDA | United States Department of Agriculture |
| DAE | Department of Agricultural Extension |
| USA | United States of America |
| FMT | Farm Management Technicians |
| IADP | Intensive Agricultural District Programme |
| KROs | Knowledge Ready Organisations |
| SMOs | Subject Matter Officers |
| VLWs | Village Level Workers |
| ADOs | Agricultural Development Officers |
| BCR | Benefit Cost Ratio |
| PFI | Problem Faced Index |
| SAAO | Sub-Assistant Agriculture Officer |

YIELD PERFORMANCE OF SWEET POTATO CULTIVATION AT FARMERS' FIELD

ABSTRACT

The objectives of this study were to assess and describe some selected characteristics of the sweet potato farmers, to determine the extent of performance of farmers on sweet potato cultivation; to explore the relationship between each of the selected characteristics of the farmers with their performance of sweet potato cultivation, to compare severity of the problem of the performance of different sweet potato varieties and to compare the performance of different sweet potato varieties. The study was conducted with randomly selected 102 farmers in four upazila of four districts. A pre-tested interview schedule was used to collect data from the respondents during February 20 to March 20, 2019. Yield performance of different sweet potato varieties was the dependent variable and the dependent variable was measured by variable was measured on basis of yield tons per hectare. The extent of performance of farmers on sweet potato cultivation was measured with performance. Performance of different sweet potato varieties and the selected eleven characteristics of the respondents relationship with the independent variables of the study. Majority (61.8 percent) of the sweet potato had medium performance and 20.6 percent of them had low performance. Five characteristics of the respondent's viz. education, training exposure, cosmopolitaness, extension contact and knowledge on sweet potato cultivation had significant positive relationship with performance of different sweet potato varieties. But age, family size, land under sweet potato cultivation, benefit cost ratio (BCR), commercialization and problems faced in sweet potato cultivation had non-significant relationship with their performance of sweet potato cultivation.

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CHAPTER I

INTRODUCTION

1.1 General Background of the Study

Bangladesh is a developing country with agro-based economy which accounts for 14.10% of country's GDP and source of employment of 44.1% of its people (BBS, 2018). That is why agriculture is the main economic culture of Bangladesh. People depend upon agriculture for their employment, poverty alleviation, human resource development and food security. To meet these demands a lot of crops are grown in our country traditionally.

Sweet potatoes pack a powerful nutritional punch. Sweet potatoes also contain high amounts of Vitamin-A, fiber and potassium. They have more grams of natural sugars than regular potato but more overall nutrients with fewer calories

Sweet potatoes (*Ipomoea batatas*) are a warm weather vegetable; they do not grow like regular potatoes. Growing sweet potatoes require a long frost-free growing season. When thinking about how to grow sweet potato plants, realize that these particular tubers grow on vines.

There are more than 6,000 different varieties of sweet potatoes worldwide, and growers in the United States can select from more than 100 different types. Sweet potatoes are versatile veggies that may be mild or extra sweet, with flesh of white, red, yellow-orange or purple. Skin color of sweet potato types vary widely from creamy white to rosy red, tan, purple or yellow-orange. If that isn't enough to think about, sweet potato vines can be compact, vigorous, or semi-bush. Read on to learn about a few of the most popular sweet potato varieties.

Sweet potatoes may help maintain a healthy blood pressure and protect against cancer. The high fiber content of sweet potatoes helps prevent constipation. One medium, baked sweet potato with skin contains just

103 calories. The fastest way to prepare a sweet potato is in the microwave. Although there is much confusion, sweet potatoes are not related to yams. Consuming fruits and vegetables of all kinds has long been associated with a reduced risk of many adverse health conditions.

According to the USDA's national nutrient database, one medium, baked sweet potato with skin (2 inches in diameter, 5 inches long, approximately 114 grams) provides: well over 100 percent of our daily needs for vitamin A, as well as 25 percent of vitamin C, 25 percent of vitamin B₆, 12 percent of potassium. Sweet potatoes are a great source of beta-carotene, a powerful antioxidant that gives orange fruits and vegetables their vibrant colour. Beta-carotene is converted to vitamin A in the body. Consuming foods rich in beta-carotene may reduce the risk of developing certain types of cancer, offer protection against asthma and heart disease, and delay aging and body degeneration. Sweet potato production trends in Bangladesh is give Figure 1.1

As recorded in BBS, 2017

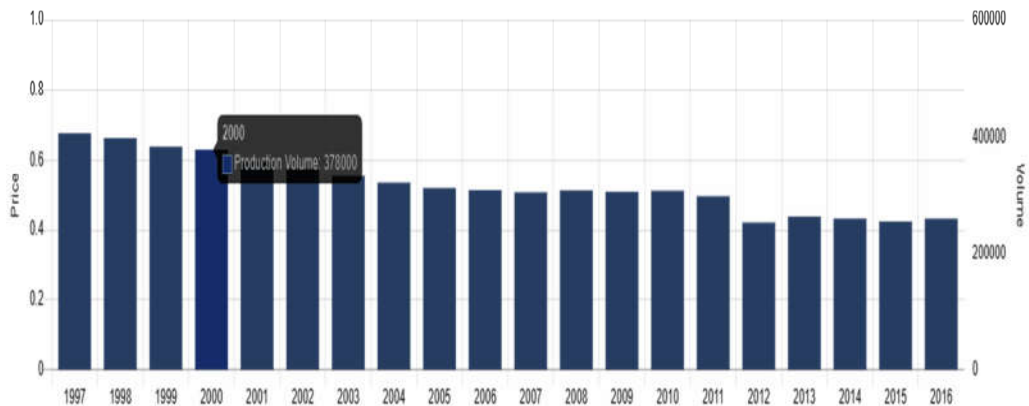


Figure 1.1 Sweet potato production trends in Bangladesh (BBS, 2017)

Many of the farmers are showing their interests in cultivation of sweet potato in four districts of Bangladesh including char areas, for a higher demand of the crop with good market price. Low production cost and easy cultivation process made the farmers eager in its cultivation and for this reason its cultivation has increased considerably in char areas. A farmer of Shibgonj upazila mentioned

that he has cultivated the crop on 45 decimals of land this season by spending about Tk. 10,500. He has already earned Tk. 21500 by selling the grown sweet potatoes and is hopeful for getting more during the rest of the season. Another farmer of Gobindogonj upazila reported that he has brought 30 decimals of land under sweet potato cultivation this season. He has earned Tk. 14,200 so far from the sale of the sweet potatoes. Sweet potato production trend in Bangladesh is presented in Table 1.1 as reported in BBS (2018).

Table 1.1 Sweet potato production in Bangladesh

| Years | Production/tones |
|--------------|-------------------------|
| 2017 | 262,702.00 |
| 2016 | 259,372.00 |
| 2015 | 254,633.00 |
| 2014 | 259,472.00 |

Source: BBS, 2018

Department of Agriculture Extension (DAE) has set a target of yielding around 1.25 lakh tons sweet potato from around 8,050 hectares of land in the country's northwest region during the current season. The sources said that DAE and other government and non-government organizations concerned have taken necessary measures to make the sweet potato cultivation a success in the region. Additional Director of DAE said that sandy lands and the riverbeds (chars) are suitable for the sweet potato cultivation. So, people of the Ganges and Brahmaputra basins and the remote char areas are habituated in the farming widely besides consuming it. Production cost of the crop is very low, as it requires less fertilizer and irrigation. He said nutritive value of the crop is similar to rice and its taste is delicious. It contains vitamin A and C and expected mineral elements, which are absent in rice. It is also enriched with protein, carbohydrate, calcium, iron, carotene and vitamin B₁ and B₂, which are essential for human body. An adult person needs 13 grams of vitamin A per day it can be fulfilled after consuming only a single sweet potato.

Agriculturist mentioned that people of Philippines and Papua New Guinea consume sweet potato as the alternative of rice while in USA and Japan it is used as food widely. He also mentioned that different types of tasty foods like halua, payesh, bread, pauruti, biscuit, pastry and cake could be made through processing the indigenous potato. If we can make the people habituated to sweet potato consumption the nation can reduce its dependence on rice to a greater extent. Steps should be taken to make the people in general aware in this regard. In this context, it may be mentioned that importance should be given for providing adequate training and agri-loans among the farmers.

Sher-e-Bangla Agricultural University is conducting a research project entitled “Feasibility Survey for SDGs Business on Sweet Potato Production, Processing and Marketing for Improvement of Small Scale Farmers’ Income and Reduction of Post-harvest Losses”, with the financial help from JICA and supported by Maruhisa Co. Ltd. Japan. The research is conducting in Sher-e-Bangla Agricultural University field and in the fields of farmers of four districts in Bangladesh. This project had provided a scholarship to the present researcher to conduct the research on Farmers’ performance on sweet potato cultivation.

1.2 Statement of Problem

Agriculture sector is the single largest contributor to income and employment generation and accepted the challenge to achieve self-sufficiency in food production. It shoulders the responsibility to reduce rural poverty through sustainable agriculture development. But it depends not only on technology generation but also on dissemination of technology. In order to make the study manageable, the following research questions were taken into consideration.

1. What were the extents of the selected characteristics of the sweet potato farmers?

2. What was the extent of performance of sweet potato cultivation at farmer's field?
3. What were the relationships between each of the selected characteristics of farmers and the performance of sweet potato cultivation at their field?
4. What were the extents of severity of different problems faced by the sweet potato farmers'?
5. What was the comparative performance of different sweet potato varieties at farmers' field?

1.3 Specific Objectives of the Study

1. To assess and describe following selected characteristics of the sweet potato farmers:
 - Age
 - Level of Education
 - Family Size
 - Land under sweet potato cultivation
 - Training Exposure
 - Cosmopolitaness
 - Benefit cost ratio of sweet potato cultivation
 - Commercialization of sweet potato
 - Agricultural Extension Media contact
 - Knowledge on sweet potato cultivation
 - Problems faced in sweet potato cultivation
2. To determine the extent of performance of farmers on sweet potato cultivation
3. To explore the relationship between each of the selected characteristics of the farmers with their performance of sweet potato cultivation
4. To compare severity of the problem faced by the farmers in sweet potato cultivation
5. To compare the performance of different sweet potato varieties

1.4 Justification of the Study

Sweet potato cultivation is getting popularity among the farmers of Bangladesh by the introduction of new hybrid varieties coupled with growing market demand as well as food have opened a tremendous potentiality of rice, wheat and maize. JICA funded and Maruhisa Co. Ltd. Supported “Feasibility Survey for SDGs Business on Sweet Potato Production, Processing and Marketing for Improvement of Small-Scale Farmers’ Income and Reduction of Post-harvest Losses” project of SAU, introduced Kokei, Khogene, Bene, BARI Sweet potato 12. The government is also supporting this growth. Needless to say, that research is necessary to determine pattern of climate of agriculture in order to formulate long-term strategy on crops production. As no research in the field of sweet potato of this technology has been identified so far, the researcher deemed it a timely necessity to undertake the present study entitled “Performance of sweet potato at farmers’ field”.

1.5 Assumptions of the Study

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

- The respondents, included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.
- Views and opinions furnished by the respondents were the representative views and opinions of the whole population of the study.
- The responses furnished by the respondents were reliable. The researcher was well adjusted to the social environment of the study area. So the respondents gave their opinions without any hesitation.

- All the data concerning the independent and dependent variables were normally and independently distributed with their respective means and standard deviation.
- The findings of the study would be applicable to other parts of the country with similar personal, socio-economic and cultural conditions.

1.6 Limitation and Scope of the Study

Considering the time, money and other necessary resources available to the researcher and to make the study manageable and meaningful it became necessary to impose certain limitations & scopes. The limitations were as follows:

- The study was confined to four upazila under four districts as a study area.
- Population for the present study was kept confined within the sweet potato farmers.
- There were many characteristics of the sweet potato farmers in the study area but only eleven of them were selected for investigation.
- For information about the study, the researcher depended on the data furnished by the selected respondents during their interview with this researcher.
- Facts and figures collected by the researcher applied to the situation prevailing during the year 2018.

Findings of the study will be particularly applicable in a selected area of four upazila under four districts. However, the findings may also have applications for other areas of Bangladesh where the physical, socio- economic and cultural condition do not differ much from those of the study area. Thus, the findings will be helpful to the researchers, planners, policy makers and extension

workers for diffusion of agricultural innovations as well as agricultural development in our country.

1.7 Definition of terms

A concept is an abstract of observed thing; events or phenomenon or in other words, it is a short hand representation of variety of facts. A researcher needs to know the meaning and contents of every term that used for a study. It should clarify the issue as well as explain the fact to the investigator and readers. However, for clarity of understanding, a number of key concepts/terms frequently used throughout the study are defined as follows:

Age

Age of a respondent is defined as the span of life and is operationally measured by the number of years from his/her birth to the time of interviewing.

Level of Education

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

Family size

Family size refers to the number of member including the respondent himself/herself, his/her wife/husband children and other permanent dependents, who live together in a family unit.

Land under sweet potato cultivation

It referred to the total area on which a farmer's family carries on farming operation. The area is estimated in terms of full benefit to the farmer's family.

Training Exposure

Training exposure score of a respondent was obtained by the number of days that a respondent had received training in his or her entire life.

Commercialization of sweet potato

Commercialization of an individual referred to the ratio of value of sweet potato sold and total value of sweet potato raised. It was expressed in percentage.

Cosmopolitaness

Cosmopolitaness referred to the degree to which an individual was oriented external to his own social system.

Problems faced in sweet potato cultivation

It referred to the extent of problems faced by a respondent in sweet potato cultivation.

Sweet potato cultivation knowledge

Literally knowledge means knowing or what one knows about a subject, fact, person etc. Knowledge on sweet potato cultivation referred to the understanding of the sweet potato related about the different aspects of scientific agriculture such as improved seed, fertilizer, plant protection, irrigation, etc.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this Chapter is to review the literature having relevance to the present study. The knowledge of research findings is essential for research workers not only to apply the previous research findings to solve the human problems, but also to conduct further research based on past human experience and experiments, before elaborating the research design, methods and result on present study, it would be necessary to review the relevant studies reported in regard to performance. This would obviously lead to better generation of the facts to formulate certain hypotheses relating to performance of different sweet potato varieties.

The researcher has made an exhaustive search for whatever studies available in this regard and they are reviewed in this chapter under the following sections.

2.1 Concept of Performance

According to Malcom (1975), Performance assessment in the area of knowledge requires the participants to demonstrate in some way what he/she knows or at least recall. If the desired knowledge is in an established academic subject field, or in any of several technical or vocational fields, one or more of the nationally standardized subject knowledge tests may help participants to assess his/ her present level of performance

Malcom (1975) defined performance assessment in the area of attitudes is much more difficult and even less precise than the areas of knowledge and skill. Some standardized tests exist that can be used to get verbalizations about self-perceived attitudes, but there is a little assurance that this are the ones that will be acted on a particular situation when the chips are down. He also stated performance assessment in a area of skill requires that the participant do the action in question and have his proficiency rated in some way. If a standardized

test for assessing performance is not available, a teacher made test could be used.

2.2 Review of Literature Related to Relationship between Different Characteristics of sweet potato farmers' and Performance

2.2.1 Age and performance

Haider (2005) found that age of the farmer had no significant relationship in response to IPM practices.

Andersone et al. (1964) pointed that in many cases the performances of older workers differ from that of the younger ones.

Fruchey (1953) reported that age, experience were not differential characteristics of the more effective and less effective extension workers.

Patel and Legans (1968) reported that VLWs in the age groups 26-35 were more effective than those of other age groups.

Sinha and Sarma (1962) also reported positive relationship between age and performance.

Hoque (2007) conducted a study on Performance assessment of the beneficiaries involved in high value crop production and concluded there was a significant relationship on age and performance.

Kubde (1979) found that of KROs yielded substantial direct path coefficient. This indicates that the older-employees performed better on the job as compared to the younger ones.

Sierria (1978) found that there was no relationship between age and

performance, but the young respondents trended to be low performers.

Yupakom (1972) found a significant relationship between the Farm Management Technicians' age and their role performance.

Intodia and Shaktawat (1980) found no significant association between age of the respondents and role perceived and role performed by them.

2.2.2 Level of education and performance

The study of Collison and Cooney (1966) supported the view that there was no relationship of education with role performance.

Kherde (1971) found that the relationship between the actual educational level of village level workers and their role performance was negatively significant at 0.05 level of probability.

Kherde and Sahaya (1972) in their combined study concluded in two intensive agricultural district program (IADP) districts of India found that education level of village level workers was negatively associated with their role performance.

Hoque (2007) conducted a study on Performance assessment of the beneficiaries involved in high value crop production and concluded there was a significant relationship on level of education and performance.

Rahudkar (1962) found that the village level workers having higher secondary course fell in the most effective group and those below higher secondary standards were mostly in the least effective group while graduates were found to be the mediocre.

2.2.3 Family size and performance

Haider (2005) found that family size of the farmers' had no relationship with the response of IPM practices

Farhad (2003) found that family size of rural women farmers had insignificant negative relationship with their knowledge of IPM in vegetable cultivation.

Akand (2001) concluded that family size of the farmers had no significant relationship with their attitude towards Rice-Fish cultivation program of CARE. In case the study of Nurzaman *et al* (2001), they found there was a significant relationship of the female FFS farmers with their practices of IPM and the family size

Rahman (2000) found a significant negative relationship with their attitude towards organic farming and family size.

Hoque (2007) conducted a study on Performance assessment of the beneficiaries involved in high value crop production and concluded there was a significant relationship with family size and performance

2.2.4 Land under sweet potato cultivation and performance

No literature was found related to relationship between land under sweet potato cultivation and performance of sweet potato cultivation.

2.2.5 Training exposure and performance

Narayana (1980) reported that periodical and monthly workshops, and fortnightly functionaries and had provided better opportunities to acquire the needed skills of the technology.

Haque (2007) conducted a study on Performance assessment of the beneficiaries involved in high value crop production and concluded there was no significant relationship of training exposure and performance.

Sierra (1978) revealed that there was a significant positive relationship between the number of training program attended by the respondents and their role performance.

2.2.6 Cosmopolitaness and performance

Haider (2005) concluded that cosmopolitaness of the farmer had no relationship with the response of IPM practices.

Hoque (2007) conducted a study on Performance assessment of the beneficiaries involved in high value crop production and concluded there was no significant relationship on cosmopolitaness and performance.

2.2.7 Benefit cost ratio and performance

No literature was found related to relationship between benefit cost ratio and performance of sweet potato cultivation.

2.2.8 Commercialization and performance

No literature was found related to relationship between commercialization and performance of sweet potato cultivation.

2.2.9 Extension media contact and performance

Haider (2005) found in his study that the extension media contact had significant relationship towards farmer's response in IPM practices

Vidyasharkar (1977) revealed that the contact with extension agency had favorably to the attitude of the farmers.

Verma and kumar (1991) found that there was positive and significant relationship between extension contact, radio listening and attitudes towards buffalo management in adopted as well as non-adopted villagers.

Perveen (1993) found that extension contact and mass exposure had significant influence upon opinion, level of knowledge and adoption of selected programs of rural women.

2.2.10 Knowledge and performance

No literature was found related to relationship between knowledge and performance of sweet potato cultivation.

2.2.11 Problem faced and performance

No literature was found related to relationship between problems faced and performance of sweet potato cultivation.

2.3 Research gap of the Study: There are a lots of research on performance but a very few research are so far conducted to ascertain the performance of sweet potato. Some researchers have found positive significant relationship between the selected characteristics and performance. On the other hand some other found have no significant relationship and very few have found negative significant relationship. Hence, the researcher carried out the present study to ascertain performance of sweet potato at farmers' field.

2.4 Conceptual Framework of the Study

Review of the past studies and literature indicated various factors influenced the performance of sweet potato at farmer's field. It is sometimes difficult to deal with all the factors in a single study. Related literature, discussion with the experts and Research Fellows in the relevant field and available resources at hand helped the researcher in selecting 11 characteristics of the farmers to assess the relationship with their performance of sweet potato cultivation. The selected characteristics of the sweet potato farmers were age, education, family member, land under sweet potato cultivation, training exposure, cosmopolitaness, cost of sweet potato cultivation, income from sweet potato

cultivation, benefit cost ratio, commercialization, extension media contact, knowledge on sweet potato cultivation and problems faced in sweet potato cultivation and explanatory variable. Performance of sweet potato of the farmers was the main focus of the study. Based on these considerations a simple conceptual Framework for the study is drawn and show figure 2.1 below

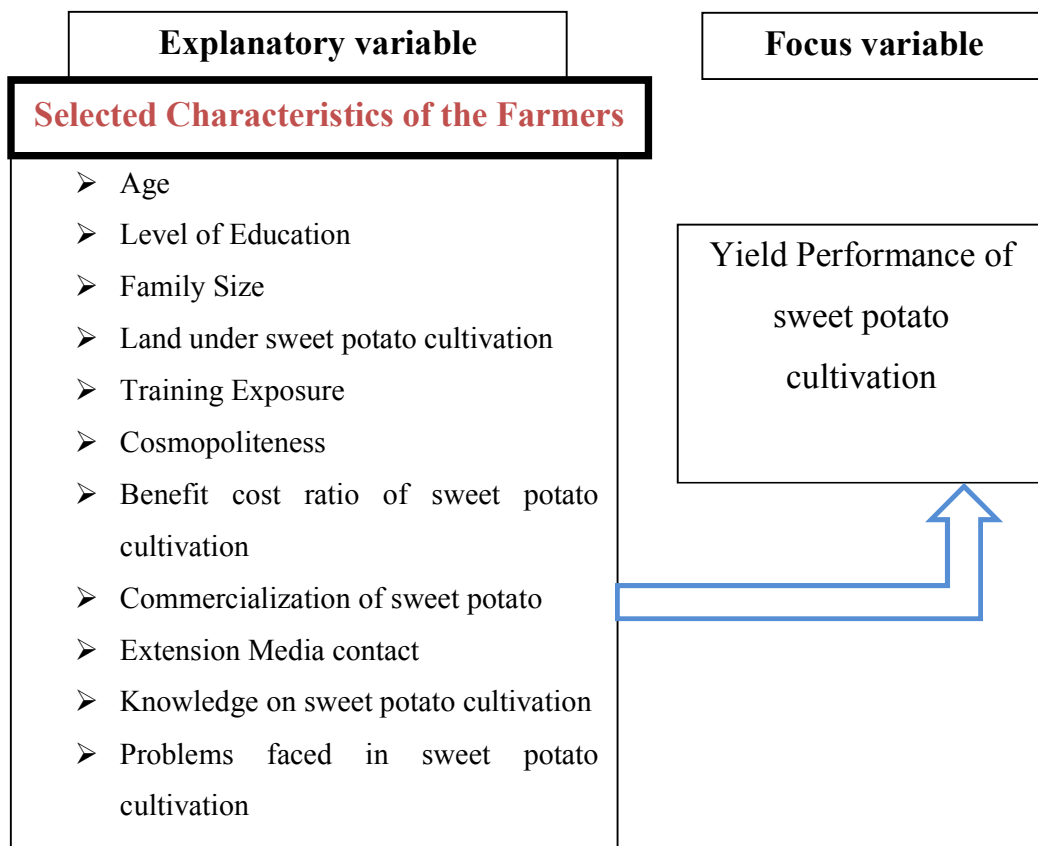


Figure 2.1: The Conceptual Framework of the Study

CHAPTER III

METHODOLOGY

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

3.1 Locale of the study:

JICA funded and Maruhisa Co. Ltd. Supported “Feasibility Survey for SDGs Business on Sweet Potato Production, Processing and Marketing for Improvement of Small-Scale Farmers’ Income and Reduction of Post-harvest Losses” project of SAU was conducted at Shibgonj upazila of Bogura district, Gobindogonj upazila of Gaibandha district, Bhedargonj upazila of Shariatpur district and Sherpur sadar upazila of Sherpur district. As a Research Fellow of this project, the researcher of this study selected purposively these four upazilas as the locale of the study. Maps of these upazilas and districts are shown in figure 3.1 to figure 3.4.

3.2 Population and sampling procedure

In the selected four upazila of four districts, 102 farmers were found as sweet potato growers, all these 102 sweet potato farmers were constituted the population of the study. As these 102 farmers were small in size and manageable for the researchers, the whole population was selected as the sample of the study. Number of sweet potato farmers of the upazilas and district may be seen in Table 3.1.



Figure 3.1: Map of Shibganj upazila under Bogura districts showing study area

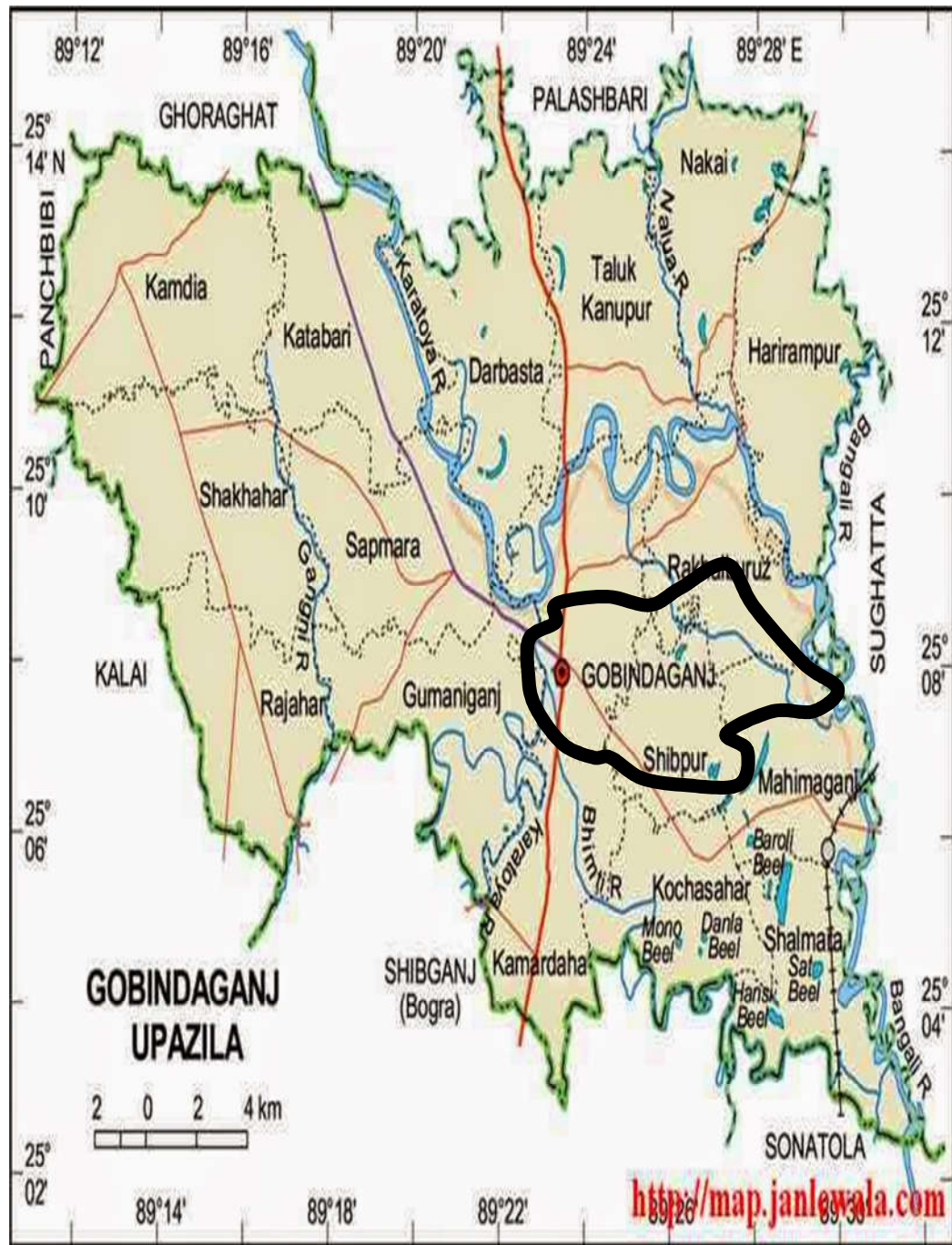


Figure 3.2: Map of Godindogonj upazila showing the study area

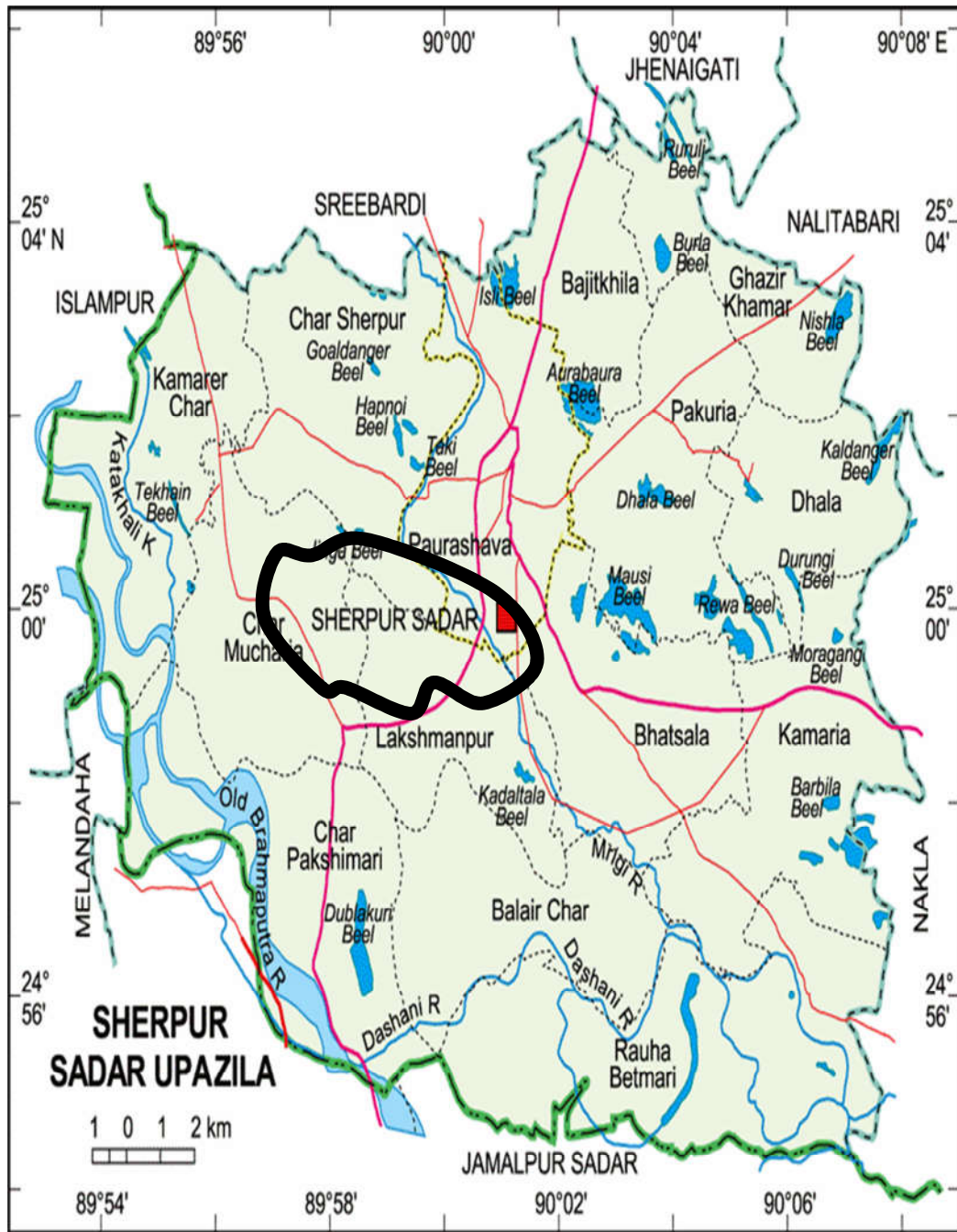


Figure 3.3: Map of Sherpur sadar upazila showing the study area

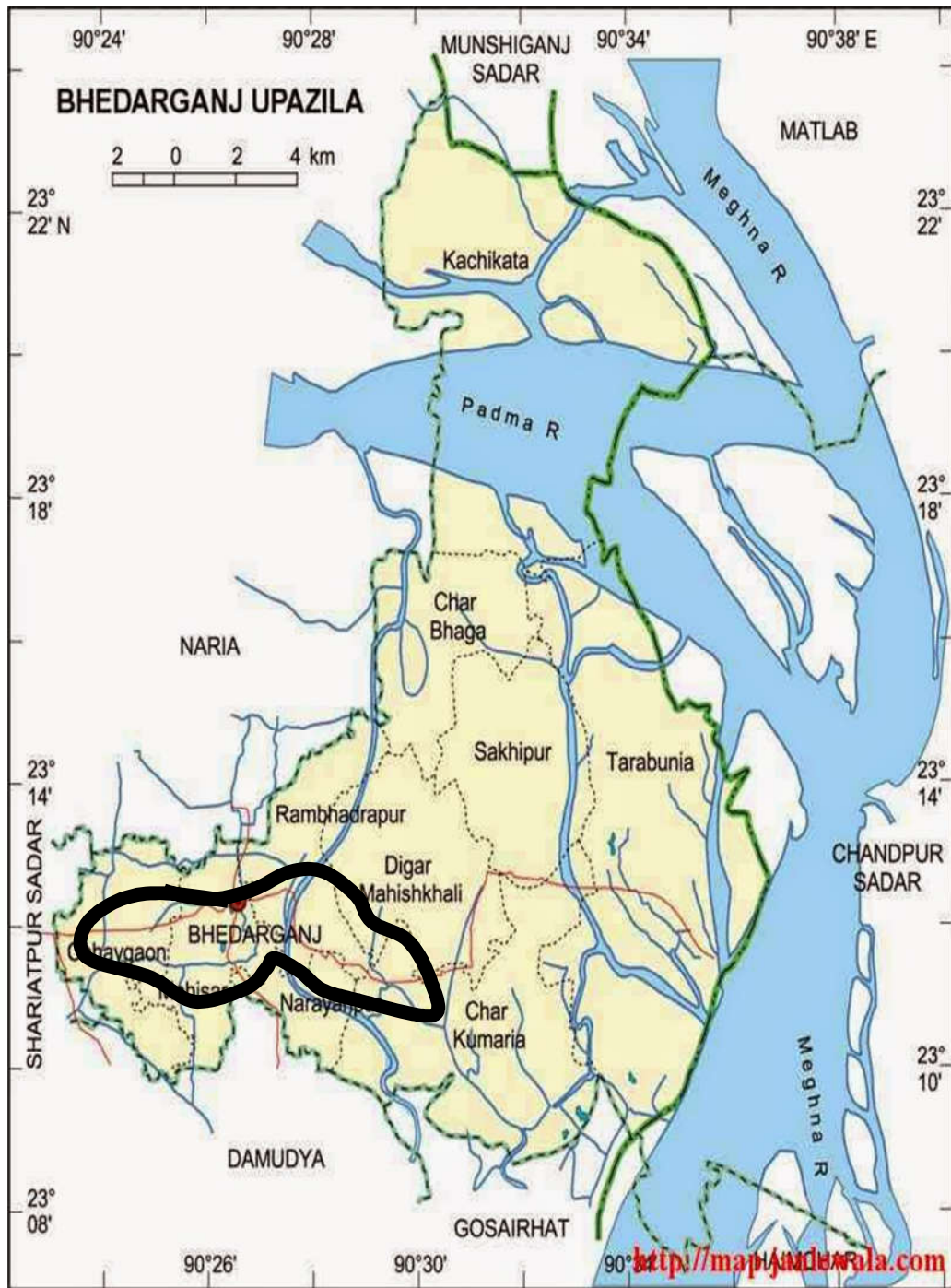


Figure 3.4: Map of Bhedarganj upazila showing study area

Table 3.1 Distribution of population and sample

| Name of the Districts | Name of the Upazila | Population | Sample size |
|-----------------------|---------------------|------------|-------------|
| Bogura | Shibgonj | 25 | 25 |
| Gaibandha | Gobindogonj | 25 | 25 |
| Sherpur | Sherpur sadar | 28 | 28 |
| Shariatpur | Bhedarganj | 24 | 24 |
| Total | | 102 | 102 |

3.3 Data collecting instrument

In order to collect valid and reliable data from the farmers interview schedule (questionnaire) was designed by keeping the objectives in mind. Simple and direct questions and different scales were used to obtain information. Both open and closed form questions were designed to obtain relevant information. Initially a draft interview schedule was prepared and administered to 20 farmers of the locale. Based on the pre-test result, the final interview schedule was prepared after necessary corrections.

3.4 Selection of Variables

In this research the researcher selected eleven characteristics of the sweet potato farmers were selected as the explanatory variables. The characteristics includes age, level of education, family size, land under sweet potato cultivation, training exposure, cosmopolitaness, benefit cost ratio (BCR), commercialisation, extension media contact, sweet potato cultivation knowledge and problems faced in sweet potato cultivation. Yield performance of sweet potato cultivation was the focus of the study.

3.5 Measurement of Variables

3.5.1 Age

Age of the respondents was calculated on the basis of total period of time from respondents' birth to the time of interview. It was obtained by asking direct question and was measured in terms of year. Since Bangladeshi rural people actually do not keep record of their birth date, age was sometimes based on arbitrary estimates.

3.5.2 Level of Education

Level of Education was measured on the basis of schooling years. One score was assigned for one year of successful schooling. If a respondent passed final examination of class V, his education score was taken as 5. If the respondent - was educated in Madrasa and the level of his education was equal to the level of class III, his education score was taken as 3. For illiterate respondents who had no formal schooling, the education score was taken as zero (0). Respondents who could sign their name only were given a score of 0.5. Education score of a respondent was determined from his response to Item no. 2 of the interview schedule.

3.5.3 Family size

Family size of a respondent was measured on the basis of number of members living with the family. It includes the respondent himself, his spouse, children, father, mother, brothers and sisters, grandfather, grandmother and other dependents.

3.5.4 Land under sweet potato cultivation

Land is the most important capital of a farmer and the farm size has influence on many personal characteristics of a farmer. Land under sweet potato cultivation of the farmer was measured by the land area his/her cultivated sweet potato. Data obtained in response to questions under item No. 4 of the

interview schedule formed the basis for determining the land under sweet potato cultivation of the respondent. The unit of measurement was decimal.

3.5.5 Agricultural Training Exposure

Training exposure score of a respondent was obtained by the number of days that a respondent had received agricultural training in his or her entire life. It was indicated by the total number of days of training received by a respondent under different training programs.

3.5.6 Cosmopolitaness

Cosmopolitaness refers to a farmer's nature of the visit with six selected places. The respondents were asked to mention the nature of cosmopolitaness with six selected places with five alternative responses as 'regularly', 'frequently', 'occasionally', 'rarely' and 'not at all' and scores were assigned to those alternative responses as 4,3,2,1 and 0 respectively. Logical frequencies of contact were considered for each of the alternative responses for each item as indicated in item no. 6 of interview schedule the cosmopolitaness scores of a respondent was determined by adding all the scores obtained from all the six items. Thus, this cosmopolitaness score of a respondent could range '0' to '24'; while '0' (zero) indicating no cosmopolitaness and '24' indicating high cosmopolitaness.

3.5.7 Benefit cost ratio

Average return to each taka spent on production is an important criterion for measuring profitability. Benefit cost ratio (BCR) was estimated as the ratio of total return to total cost by using the following formula.

$$BCR = \frac{\text{Income from Sweet Potato Cultivation}}{\text{Cost of sweet potato cultivation}}$$

Cost of sweet potato cultivation of a respondent was measured in thousands taka on the basis of total yearly cost in sweet potato cultivation.

Income of a respondent was measured in thousands taka on the basis of total yearly earnings from sweet potato cultivation. Data obtained in response of item no. 7 of the interview schedule was used to determine the income from sweet potato cultivation of the respondents.

3.5.8 Commercialization of sweet potato

Commercialization score of a farmer was determined on the basis of value of sweet potato sold out of the total value of sweet potato raised. As developed by Karim and Mahboob (1974) and used by Abdullah (2013) the following formula was followed in computing the commercialization of sweet potato score of a farmer:

$$\text{Commercialization} = \frac{\text{Value of sold crops}}{\text{Total value of raised crops}} \times 100$$

Relevant market price was used in determining the commercialization score of an individual. Commercialization score could range from 0 to 100, while 0 indicating no commercialization and 100 indicating very high commercialization.

3.5.9 Extension media Contact

Extension media contact refers to a farmer's nature of the contact with seven selected extension media. The respondents were asked to mention the nature of contacts with seven selected media with five alternative responses as 'regularly', 'frequently', 'occasionally', 'rarely' and 'not at all' and scores were assigned to those alternative responses as 4,3,2,1 and 0 respectively. Logical frequencies of contact were considered for each of the alternative responses for each media as indicated in item no. 9 of interview schedule. Extension contact of a respondent was measured by adding all the scores obtained from all the seven items. Thus, this extension contact score of a

respondent could range '0' to '28'; while '0' (zero) indicating no extension contact and '28' indicating high extension contact.

3.5.10 Knowledge on Sweet potato cultivation

Knowledge of the farmers on sweet potato cultivation was measured by asking 10 selected questions related to sweet potato cultivation. A full score of 2 (two) was assigned for each correct answer and 0 (zero) score was assigned for the wrong or no answer. Partial score was assigned for partially correct answer. Therefore, for correct responses to all the questions, a respondent could get a total score of '20', while for wrong responses to all the questions a respondent could get '0' (zero). However, the knowledge on sweet potato cultivation scores of the respondents was computed by adding his scores for all the 10 questions. Thus, the knowledge on sweet potato cultivation scores could range from '0' to '20', where '0' (zero) indicates very low knowledge on sweet potato cultivation and '20' indicates very high knowledge on sweet potato cultivation.

3.5.11 Problems faced in sweet potato cultivation

Fifteen problems were selected for the study after thorough consultation with supervisor, co-supervisors and relevant experts. The respondents were asked to four alternatives responses as 'high problem', 'medium problem' and 'low problem' and 'not at all problem' for each of 15 selected problems. Scores were assigned to those alternative responses as 3, 2, 1 and 0 respectively. Problems faced scores of a respondent were determined by adding the scores obtained from all the 15 problem items. Thus, the problems faced score of the respondent could range from 0-45, where, "0" indicated no problems and "45" indicated highest problems.

Score for particular problem was measured by Problem Faced Index (PFI) as follows:

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

Where,

PFI = Problem Faced Index

P_s = No. of respondents faced serious problem

P_m = No. of respondents faced medium problem

P_l = No. of respondents faced low problem

P_n = No. of respondents faced not at all problem

Thus, PFI for a particular problem could range from '0' to '306', while '0' indicating no problem and '306' indicating highest problem faced. PFI for all the problems were determined. Finally, a rank order was made on the basis of PFI.

3.5.12 Performance of sweet potato cultivation

Performance of sweet potato cultivation was the main focus of the study. It was measured by the yield per hectare in tons. Farmers were asked to indicate their land size for sweet potato cultivation of different varieties. Then they were asked to indicate their yield of each sweet potato varieties. Then yield performance of a sweet potato cultivation of farmers was determined by the following formula:

$$P = \frac{\text{Yield of all the varieties of all the farmers}}{\text{Area of land (ha) for all the varieties of all the farmers}}$$

To compare the performance of individual varieties following formula was used:

$$\text{Performance of a variety} = \frac{\text{Yield of a variety of all the farmers}}{\text{Area of land (ha) of that variety of all the farmers}}$$

3.6 Statement of Hypothesis

A set of hypotheses was formulated for empirical testing. The following null hypotheses were formulated to test the contribution of 11 selected

characteristics of the farmers with their performance of sweet potato cultivation.

“There is no relation between each of the selected characteristics of the farmers and their performance of sweet potato cultivation.”

3.7 Collection of Data

Data were collected by interview procedure from 102 selected respondents by the researcher himself. The interview schedule prepared earlier was used for collection of data. Interviews were usually conducted with the respondents in their home. Before going to the respondents for interview, they were duly informed to ensure their availability on time. While starting interview with any respondent, the researcher took utmost care to establish rapport with the respondent so that he/she did not feel hesitant to furnish the desired information. Investigator explained clearly the purpose of the study to the respondents. The researcher explained/reviewed the issue to the respondents who failed to understand the question or recollect the previous activities. The researcher did not face any problem in collecting data rather he received excellent cooperation from the respondents during the time of interview. The Agriculture Extension Officer of four Upazila with his officials cordially helped the investigator to collect the data. Data were collected during January 20 to February 20, 2019.

3.8 Data Analysis Procedure

Collected data were coded, compiled and analysed according to the objectives of the study. The SPSS (computer programme) was used to perform the data analysis. Descriptive statistics such as number and percent distribution mean, standard deviation, range, and rank order were used to describe the data. To determine the relationship between each of the selected characteristics of the farmers and their performance of sweet potato cultivation. Pearson Product Moment correlation coefficient was computed. Throughout the study a 0.05

and 0.01 level of probability with 100 degrees of freedom was used to reject any null hypothesis.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter deals with the findings those were recorded in accordance with the objectives of the study with the help of an interview schedule and probable discussion of the findings with justifiable interpretation. The chapter content in five (5) sections. The first section of this chapter deals with the characteristics of the sweet potato farmers. The second section deals with the performance of sweet potato cultivation of the farmers. The third section deals with the relationship between each of the selected characteristics of the sweet potato farmers with their performance in sweet potato cultivation. The fourth section deals with the rank order of the problem faced by the farmers during sweet potato cultivation. The fifth sections deal with the comparative performance of different sweet potato varieties.

4.1 Characteristics of the sweet potato farmers

An individual possesses various interrelated characteristics. In this present study 11 selected characteristics of the sweet potato farmers such as age, level of education, family size, land under sweet potato cultivation, training exposure, cosmopolitaness, benefit cost ratio (BCR), commercialisation, extension media contact, agricultural knowledge on sweet potato cultivation and problems faced in sweet potato cultivation was considered. The salient features of these characteristics are presented in Table 4.1 and described in following sub-sections:

Table 4.1 Characteristics profile of the respondents

| Sl. No. | Characteristics (with measuring unit) | Range | | Mean | Standard deviation |
|---------|---|----------|-------------|-------|--------------------|
| | | Possible | Observed | | |
| 01 | Age (years) | Unknown | 29 –70 | 43.33 | 8.168 |
| 02 | Level of education (schooling years) | Unknown | 0.0 – 18 | 5.52 | 4.86 |
| 03 | Family size (number of members) | Unknown | 2-15 | 5.90 | 2.24 |
| 04 | Land under sweet potato cultivation (decimal) | Unknown | 11 - 165 | 50.33 | 33.25 |
| 05 | Training exposure (Number of days) | Unknown | 0 – 7 | 2.18 | 2.15 |
| 06 | Cosmopolitaness (Score) | 0-24 | 7 – 22 | 15.92 | 4.41 |
| 07 | BCR | Unknown | 2.10–4.50 | 2.84 | 0.54 |
| 08 | Commercialization | 0 - 100 | 87.18–96.88 | 93.23 | 2.40 |
| 09 | Extension contact (Score) | 0 - 28 | 9 – 24 | 15.13 | 2.89 |
| 10 | Knowledge on sweet potato cultivation (Score) | 0 - 20 | 12 – 20 | 16.36 | 1.65 |
| 11 | Problems faced in sweet potato cultivations (Score) | 0-45 | 21-40 | 29.64 | 5.20 |

4.1.1 Age

The age of the respondent has been varied from 29 to 70 years with the mean and standard deviation 43.33 and 8.17 respectively. Considering the observed age of the respondents, they were classified into three categories namely young, middle aged and old (MoYS, 2012). The distribution of the respondent to accordance of their age is presented in Table 4.2.

Table 4.2 Distribution of the respondents according to their age

| Categories | Basis of categorization (year) | Respondents | |
|-------------|--------------------------------|-------------|---------|
| | | Numbers | Percent |
| Young aged | Up to 35 | 20 | 19.6 |
| Middle aged | 36-50 | 66 | 64.7 |
| Old | Above 50 | 16 | 15.7 |
| Total | | 102 | 100 |

Table 4.2 indicates that the middle-aged sweet potato farmers comprised the highest proportion (64.7 percent) followed by young aged (19.6 percent) and old (15.7 percent). Data also indicates that the middle and young aged respondents constitute 84.3 percent of the respondents because elderly of age group seems to have higher proportion of health problems than other elderly groups.

5.1.2 Level of education

The level of educational scores of the respondents ranged from 0 to 18 with a mean and standard deviation of 5.52 and 4.86, respectively. Based on their level of education scores, the respondents were classified into four categories such as illiterate (0), can sign only (0.50), primary education (1-5), secondary education (6-10), above secondary (above 10). The distributions of the respondents according to their level of education are presented in Table 4.3.

Table 4.3 Distribution of the respondents according to their level of education

| Categories | Basis of Categorization (schooling years) | Respondents | |
|-----------------|---|-------------|------------|
| | | Number | Percent |
| Illiterate | 0 | 6 | 5.9 |
| Can sign only | 0.5 | 28 | 27.5 |
| Primary | 1-5 | 24 | 21.6 |
| Secondary | 6-10 | 30 | 37.2 |
| Above secondary | Above 10 | 8 | 7.8 |
| Total | | 102 | 100 |

Table 4.3 shows that respondent under secondary education category constitutes the highest proportion (37.2 percent) compared to 27.5 percent can only sign category and 21.6 percent primary. On the other hand, the lowest proportion (5.9 percent) constituted illiterate. Only 7.8 % of the farmers were above higher secondary. It was found that appreciable proportions (64.7 percent) of the respondents were can sign to secondary level educated. It was because of different govt. and non govt. NGO’s initiatives were trying to create consciousness about the benefit about education so people from villages were trying to get education to remove their illiteracy.

5.1.3 Family Size

Family size of the respondent sweet potato farmers ranged from 2 to 15 with the mean and standard deviation of 5.90 and 2.24, respectively. According to family size the respondents were classified into three categories viz. small, “medium” and “large” family. The distribution of the respondents according to their family size is presented in Table 4.4.

Table 4.4 Distribution of the respondents according to their family size

| Categories | Basis of categorization (year) | Respondents | |
|--------------|--------------------------------|-------------|------------|
| | | Numbers | Percent |
| Small | Up to 4 | 30 | 29.41 |
| Medium | 5-6 | 38 | 37.25 |
| Large | >6 | 34 | 33.34 |
| Total | | 102 | 100 |

Data in Table 4.4 indicate that the medium size family constitute the highest proportion (37.25 percent) followed by the large size family (33.34 percent). Only 29.41 percent respondents had large family size. Such finding is quite normal as per the situation of Bangladesh. Table 4.3 also showed that average family size of the respondents was lower than that of national average of 5.40. It is because of, now people were very much conscious about the disadvantages of large family. So they are trying to keep their family small to medium.

5.1.4 Land under sweet potato cultivation

Land under sweet potato of the respondents ranged from 11 decimal to 165 decimals with the mean of 50.53 and standard deviation of 33.25. On the basis of their land size, the farmers were classified into three categories (Mean±SD) as shown in Table 4.5.

Table 4.5 Distribution of the sweet potato growers according to their land under sweet potato cultivation

| Categories | Basis of categorization (decimal) | Respondents | |
|--------------|-----------------------------------|-------------|------------|
| | | Number | Percent |
| Small land | <17.07 (mean-1sd) | 14 | 13.7 |
| Medium land | 17.07 – 83.58 (mean±1sd) | 71 | 69.6 |
| Large land | >83.78 (>mean+1sd) | 17 | 16.7 |
| Total | | 102 | 100 |

Data presented in the Table 4.5 demonstrated that highest proportion (69.6 percent) of the farmers had small farm compared to 16.7 percent having large farm and only 13.7 percent had medium farm. The findings indicated that overwhelming majority (86.3 percent) of the farmers had medium to large farm size.

4.1.5 Agricultural Training exposure

Training exposure scores of the respondents were found to be varying from 0 to 7 days with the average of 2.18 and the standard deviation was 2.15. The farmers on the basis of their training received score were classified into three categories namely “no training”, “low training” and “medium training” as shown in Table 4.6.

Table 4.6 Distribution of the farmers according to their training exposure

| Categories | Basis of categorization (days) | Respondents | |
|--------------|--------------------------------|-------------|------------|
| | | Numbers | Percent |
| No | (0) | 37 | 36.3 |
| Low | 1-3 | 38 | 37.2 |
| Medium | Above 3 | 27 | 26.5 |
| Total | | 102 | 100 |

The Table 4.6 shows that the highest proportion (37.2 percent) of the respondents belonged to low training received, while 36.3 percent belonged to no training received and 26.5 percent belonged to medium training received category.

4.1.6 Cosmopolitaness

The score of cosmopolitaness of the farmers ranged from 7-22 with a mean and standard deviation of 15.92 and 4.41. On the basis of cosmopolitaness, the respondents were classified into three categories namely, 'low', 'medium' and 'high'. The scale used for computing the cosmopolitaness score is presented in the Table 4.7.

Table 4.7 Distribution of the farmers according to their cosmopolitaness

| Categories | Basis of categorization (score) | Respondents | |
|--------------|---------------------------------|-------------|------------|
| | | Numbers | Percent |
| Low | 11.51 (<mean-1sd) | 22 | 21.6 |
| Medium | 11.52-20.33 (mean±1sd) | 56 | 54.9 |
| High | >20.33 (>mean+1sd) | 24 | 23.5 |
| Total | | 102 | 100 |

Data contained in the Table 4.7 shows that the highest proportion (54.9%) of the respondents had medium cosmopolitaness while (23.5%) and (21.6%) of them had high and low cosmopolitaness categories. The majority of the farmers (78.4%) have medium to high cosmopolitaness. Cosmopolitaness of the farmers helps to increases their knowledge about sweet potato cultivation.

4.1.7 Benefit cost ratio

Benefit cost ratio of the respondents ranged from 2.10 to 4.50 thousand taka with a mean and standard deviation of 2.84 thousand and 0.54 thousand respectively. On the basis of their BCR, the farmers were classified into three categories, viz. low, medium and high. The distributions of the respondents according to the benefit cost ratio are presented in Table 4.8.

Table 4.8 Distribution of the respondents according to their benefit cost ratio

| Categories | Basis of categorization (score) | Respondents | |
|------------|---------------------------------|-------------|---------|
| | | Numbers | Percent |
| Low | <2.30 (<mean-1sd) | 17 | 16.7 |
| Medium | 2.31-3.38 (mean±1sd) | 67 | 65.5 |
| High | >3.38 (>mean+sd) | 18 | 17.8 |
| Total | | 102 | 100 |

Data in Table 4.8 revealed that the respondents having medium BCR constitute the highest proportion (65.5 percent) followed by low BCR (16.7 percent) and high BCR (17.8 percent). Overwhelming majority 83.3% respondents have medium to high BCR.

4.1.8 Commercialization of sweet potato cultivation

Commercialization of the farmers was found to range from 87.18 to 96.88 score against the possible range of zero (0) to 100 score with mean, standard deviation of 93.23 and 2.40 respectively. On the basis of commercialization, the respondent farmers were classified into three categories as low commercialization, medium commercialization and high commercialization (Table 4.9).

Table 4.9 Distribution of the respondents according to their commercialization

| Categories | Basis of categorization (score) | Respondents | |
|------------|---------------------------------|-------------|---------|
| | | Numbers | Percent |
| Low | <90.82 (<mean-1sd) | 16 | 15.7 |
| Medium | 90.81-95.63 (mean±1sd) | 71 | 69.6 |
| High | >95.63 (>mean+sd) | 15 | 14.7 |
| Total | | 102 | 100 |

Data presented in Table 4.9 show the distribution of the farmers on the basis of their commercialization. It indicated that highest proportion (69.6 percent) of the farmers belonged to medium commercialization group compared to 15.7 and 14.7 percent low and high commercialization group respectively. Thus, all most cent percent (85.3 percent) of the respondents had medium to low commercialization.

4.1.9 Extension media contact

The observed extension media contact score of the respondents ranged from 9 to 24. The mean score was 15.13 with the standard deviation 2.88. Based on the contact scores, the respondents were classified into three categories (Mean±SD) namely “low contact”, “medium contact” and “high contact” as shown in Table 4.10.

Table 4.10 Distribution of the farmers according to their extension contact

| Categories | Basis of categorization (score) | Respondents | |
|------------|---------------------------------|-------------|---------|
| | | Numbers | Percent |
| Low | <12.24 (<mean-1sd) | 14 | 13.7 |
| Medium | 12.25-18.02 (mean±1sd) | 75 | 73.6 |
| High | >18.01 (>mean+1sd) | 13 | 12.7 |
| Total | | 102 | 100 |

Data presented in Table 4.10 show the distribution of the farmers on the basis of their contact. It indicated that highest proportion (73.6 percent) of the farmers belonged to medium contact compared to 13.7 and 12.7 percent low and high contact group respectively. Thus, all most cent percent (87.3 percent)

of the respondents had medium to low contact.

4.1.10 Sweet potato cultivation knowledge

Knowledge on sweet potato cultivation score of the respondents could range from 12 to 20 against the possible range of 0-20. The mean and standard deviation of agricultural knowledge score was 16.37 and 1.67, respectively. On the basis of agricultural knowledge scores, the respondents were classified into three categories namely, low, medium and high knowledge. The distribution of the respondents according to their agricultural knowledge is given in Table 4.11.

Table 4.11 Distribution of the respondents according to their knowledge on sweet potato cultivation

| Categories | Basis of categorization (score) | Respondents | |
|------------|---------------------------------|-------------|---------|
| | | Numbers | Percent |
| Low | <14.71 (<mean-1sd) | 25 | 24.5 |
| Medium | 14.72-18.36 (mean±1sd) | 71 | 69.6 |
| High | >18.36 (>mean+1sd) | 6 | 5.9 |
| Total | | 102 | 100 |

Data of Table 4.11 reveals that majority (69.6 percent) of the respondents felt in medium knowledge category followed by 24.5 percent in low knowledge category and only 5.9 percent in high knowledge category. The findings of the present study reveal that 69.6 percent of the respondents in the study area had medium knowledge on sweet potato cultivation.

4.1.11 Problem faced in sweet potato cultivations

Problem faced in sweet potato cultivations scores of the respondents could range from 0 to 45 while the observed scores ranged from 21 to 40. The mean score was 29.64 with the standard deviation 5.20 as shown in Table 4.12. Based on problem faced by the farmers, the respondents were classified into three categories namely “low problem faced”, “medium problem faced” and

“high problem faced” as shown in Table 4.12

Table 4.12 Distribution of the respondents according to their problem

| Categories | Basis of categorization (score) | Respondents | |
|--------------|---------------------------------|-------------|------------|
| | | Numbers | Percent |
| Low | <24.44 (<mean-1sd) | 23 | 22.55 |
| Medium | 24.62-34.84 (mean±1sd) | 60 | 58.82 |
| High | >34.66 (>mean+1sd) | 19 | 18.63 |
| Total | | 102 | 100 |

Data contained in the Table 4.12 indicate that the highest proportion (58.82 percent) of the farmers faced medium problem while 22.55percent faced low problem and 18.63 percent faced high problem faced in sweet potato cultivation. Findings show that most (81.37 percent) of the farmers were in the categories of low to medium problem faced in sweet potato cultivation.

4.2 Performance of Sweet Potato at Farmers Field

Performance of sweet potato cultivation scores of the respondents observed scores ranged from 16.70 to 26.83 tons/ha. The mean score was 21.15 with the standard deviation 2.71 as shown in Table 4.13. Based on sweet potato varieties of the farmers, the respondents were classified into three categories namely “low performance”, “medium performance” and “high performance” as shown in Table 4.13

Table 4.13 Distribution of the respondents according to their performance

| Categories | Basis of categorization (tons/ha) | Respondents | |
|--------------|-----------------------------------|-------------|------------|
| | | Numbers | Percent |
| Low | <18.44 (<mean-1sd) | 21 | 20.6 |
| Medium | 18.45-23.86 (mean±1sd) | 63 | 61.8 |
| High | >23.86 (>mean+1sd) | 18 | 17.6 |
| Total | | 102 | 100 |

Data contained in the Table 4.13 indicate that the highest proportion (61.8 percent) of the farmers medium performance while 17.6 high performances and

20.6 percent had low performance. Findings show that most (82.4 percent) of the farmers were in the categories of medium to low performance.

4.3 Relationships between the selected characteristics of the farmers and their performance of sweet potato cultivation

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

The summary of the result of correlations co-efficient relationship between selected characteristics of the respondents and performance of sweet potato cultivation.

Table 4.14 Co-efficient of correlation showing relationship between selected characteristics of the farmers and their performance of sweet potato cultivation

| Predicted variable | Experimental variable | Computed value “r” | Tabulated value of “r” | |
|---|-------------------------------------|---------------------|------------------------|---------------|
| | | | at 0.05 level | at 0.01 level |
| Performance of sweet potato cultivation | Age | 0.021 ^{NS} | 0.192 | 0.251 |
| | Level of education | 0.344 ^{**} | | |
| | Family size | 0.055 ^{NS} | | |
| | Land under sweet potato cultivation | 0.178 ^{NS} | | |
| | Training exposure | 0.341 ^{**} | | |
| | Cosmopolitaness | 0.495 ^{**} | | |
| | BCR | 0.063 ^{NS} | | |
| | Commercialization | 0.002 ^{NS} | | |
| | Extension contact | 0.226 [*] | | |
| | Sweet potato cultivation knowledge | 0.235 [*] | | |
| Problems faced in sweet potato cultivations | -0.019 ^{NS} | | | |

NS Not significant

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

4.3.1 Age and their performance of sweet potato cultivation

The computed value of ‘r’ (0.021) was smaller than that of the tabulated value (r=0.192) with 100 degrees of freedom at 0.05 level of probability as shown in Table 4.14. Hence, the concerned null hypothesis was accepted and it was concluded that age of the farmers had no significant relationship with their performance of sweet potato cultivation.

4.3.2 Education and their performance of sweet potato cultivation

The relationship between education of the farmers and their performance of sweet potato cultivation was examined by testing the following null hypothesis.

“There was no relationship between education of the farmers and their performance of sweet potato cultivation.”

Co-efficient of correlation between the concerned variable was found to be ‘r’ = (0.344) as shown in Table 4.14. This led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- The computed value of ‘r’ = (0.344) which was greater than the table value ($r=0.251$) with 100 degrees of freedom at 0.01 level probability.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.
- The null hypothesis could be rejected.

On the basis of above findings, the null hypothesis could be rejected. Hence, the researcher concluded that education of the farmers had significant and positive relationship with their performance of sweet potato cultivation.

4.3.3 Family size and their performance of sweet potato cultivation

The computed value of ‘r’ (0.055) was smaller than that of the tabulated value ($r=0.192$) with 100 degrees of freedom at 0.05 level of probability as shown in Table 4.14. Hence, the concerned null hypothesis was accepted and it was concluded that family size of the farmers had no significant relationship with their performance of sweet potato cultivation.

4.3.4 Land under sweet potato cultivation and their performance of sweet potato cultivation

The computed value of ‘r’ (0.178) was smaller than that of the tabulated value ($r=0.192$) with 100 degrees of freedom at 0.05 level of probability as shown in Table 4.14. Hence, the concerned null hypothesis was accepted and it was concluded that land under sweet potato cultivation of the farmers had no

significant relationship with their performance of sweet potato cultivation.

4.3.5 Training and their performance of sweet potato cultivation

The relationship between training and their performance of sweet potato cultivation was examined by testing the following null hypothesis.

“There was no relationship between training of the farmers and their performance of sweet potato cultivation.”

Co-efficient of correlation between the concerned variables was found to be ‘ r ’ = (0.341) as shown in Table 4.14. This led to the following observation regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- The computed value of ‘ r ’= (0.341) which was greater than the table value ($r = 0.251$) with 100 degrees of freedom at 0.01 level probability.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.
- The null hypothesis could be rejected.

On the basis above findings, the null hypothesis could be rejected. Hence, the researcher concluded that training of the farmers had highly significant relationship with their performance of sweet potato cultivation.

4.3.6 Cosmopolitaness and their performance of sweet potato cultivation

The relationship between cosmopolitaness of the farmers and their performance of sweet potato cultivation was examined by testing the following null hypothesis.

“There was no relationship between cosmopolitaness of the farmers and their performance of sweet potato cultivation.”

Co-efficient of correlation between the concerned variable was found to be ‘ r ’ = (0.495) as shown in Table 4.14. This led to the following observation

regarding the relationship between the two variables under consideration:

- The relation showed a positive trend
- The computed value of 'r' = (0.495) which was greater than the table value ($r = 0.251$) with 100 degrees of freedom at 0.01 level probability.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.
- The null hypothesis could be rejected.

On the basis of above findings, the null hypothesis could be rejected. Hence, the researcher concluded that cosmopolitaness of the farmers had significant relationship with their performance of sweet potato cultivation.

4.3.7 Benefit cost ratio and their performance on sweet potato cultivation

The computed value of 'r' (0.063) was smaller than that of the tabulated value ($r=0.192$) with 100 degrees of freedom at 0.05 level of probability as shown in Table 4.14. Hence, the concerned null hypothesis was accepted and it was concluded that benefit cost ratio of the farmers had no significant relationship with their performance of sweet potato cultivation.

4.3.8 Commercialization and their performance on sweet potato cultivation

The computed value of 'r' (0.002) was smaller than that of the tabulated value ($r=0.192$) with 100 degrees of freedom at 0.05 level of probability as shown in Table 4.14. Hence, the concerned null hypothesis was accepted and it was concluded that commercialization of the farmers had no significant relationship with their performance of sweet potato cultivation.

4.3.9 Extension contact and their performance of sweet potato cultivation

The relationship between extension contact of the farmers and their performance of sweet potato cultivation was examined by testing the following

null hypothesis.

“There was no relationship between extension contact of the farmers and their performance of sweet potato cultivation.”

Co-efficient of correlation between the concerned variable was found to be ‘r’ = (0.226) as shown in Table 4.14. This led to the following observation regarding the relationship between the two variables under consideration:

- The relation showed a negative trend
- The computed value of ‘r’= (0.226) which was greater than the table value (r = 0.192) with 100 degrees of freedom at 0.05 level probability.
- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.
- The null hypothesis could be rejected.

Thus, it may be concluded that there was significant and positive relationship between extension contact and their performance of sweet potato cultivation. This means the farmers with high extension contact had more positive performance of sweet potato cultivation than the farmers with low extension contact.

4.3.10 Knowledge on sweet potato cultivation and their performance of sweet potato cultivation

The relationship between knowledge on sweet potato cultivation of the farmers and their performance of sweet potato cultivation was examined by testing the following null hypothesis.

“There was no relationship between knowledge on sweet potato cultivation of the farmers and their performance of sweet potato cultivation.”

Co-efficient of correlation between the concerned variable was found to be ' r ' = (0.235) as shown in Table 4.14. This led to the following relationship between the two variables under consideration.

- The relationship showed a positive trend.
- The computed value of " r " = (0.235) which was greater than the table value ($r = 0.192$) with 100 degrees of freedom at 0.05 level probability.
- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.
- The null hypothesis could be rejected.

On the basis of above findings, the null hypothesis could be rejected. Hence, the researcher concluded that knowledge on sweet potato cultivation of the farmers had significant relationship with their performance of sweet potato cultivation.

4.3.11 Problems faced in sweet potato cultivation and their performance on sweet potato cultivation

The computed value of ' r ' (-0.019) was smaller than that of the tabulated value ($r = 0.192$) with 100 degrees of freedom at 0.05 level of probability as shown in Table 4.14. Hence, the concerned null hypothesis was accepted and it was concluded that problems faced in sweet potato cultivation of the farmers had no significant relationship with their performance of sweet potato cultivation.

4.4 Comparative severity among the Problems faced by the farmers in sweet potato cultivation

The observed Problem Faced Index of the problems ranged from 86 to 283 against the possible range of 0-306 .Problem Faced Index (PFI) of the selected problems is shown in Table 4.15.

On the basis of PFI, it was observed that “high price of fertilizers and pesticides” ranked first followed by “farmers do not get proper price”, “insect and pest attack”, “lack of capital” and “lack of suitable transportation system” were the least problems faced by the farmers sweet potato cultivation.

Table: 4.15 Problem Faced Index (PFI) with Rank Order

| Statement on problems | High problem | Medium problem | Low problem | No problem | PFI | Rank order |
|--|--------------|----------------|-------------|------------|-----|------------|
| High price of fertilizers and pesticides | 87 | 9 | 4 | 2 | 283 | 1 |
| Farmers do not get proper price | 79 | 12 | 4 | 7 | 265 | 2 |
| Insect and pest attack | 77 | 11 | 6 | 6 | 259 | 3 |
| Non availability of fertilizes | 75 | 10 | 8 | 9 | 253 | 4 |
| Lack of capital | 72 | 11 | 9 | 10 | 247 | 5 |
| Late supply of modern variety | 68 | 12 | 7 | 16 | 237 | 6 |
| Malpractices in the market | 62 | 12 | 12 | 16 | 222 | 7 |
| Lack of storage facilities | 60 | 10 | 9 | 25 | 209 | 8 |
| Non availability of pesticides | 50 | 24 | 5 | 23 | 201 | 9 |
| Adverse climatic condition | 47 | 10 | 19 | 26 | 180 | 10 |
| Lack of skilled labours | 42 | 22 | 8 | 30 | 178 | 11 |
| Long chain of middlemen | 37 | 20 | 12 | 33 | 163 | 12 |
| Lack of contact by the extension workers | 28 | 18 | 10 | 46 | 130 | 13 |
| Lack of irrigation facilities | 20 | 15 | 20 | 47 | 110 | 14 |
| Lack of suitable transportation system | 10 | 18 | 20 | 54 | 86 | 15 |

4.5 Compare the performance of different sweet potato varieties

Attempts were taken to compare the performance of different varieties of sweet potato by yield/ha in tons. The formula mentioned in the methodology chapter (Page no: 25).

Table: 4.16 Performance of different sweet potato varieties

| SL. No. | Variety name | Total farmer produced | Total yield of a variety(ton) | Total area of land (ha) | Average yield(ton/ha) |
|---------|----------------------|-----------------------|-------------------------------|-------------------------|-----------------------|
| 01 | BARI SWEET POTATO 8 | 25 | 95.13 | 5.12 | 18.58 |
| 02 | Pingla | 25 | 103 | 4.89 | 21.06 |
| 03 | BARI SWEET POTATO 13 | 24 | 50.41 | 2.46 | 20.49 |
| 04 | BARI SWEET POTATO 4 | 28 | 93.04 | 4.53 | 20.54 |
| 05 | Kokei | 15 | 42.46 | 1.80 | 23.59 |
| 06 | Khogene | 4 | 5.92 | 0.33 | 17.94 |
| 07 | Bene | 4 | 6.19 | 0.33 | 18.75 |
| 08 | BARI SWEET POTATO 12 | 4 | 7.03 | 0.33 | 21.31 |

It was found that **Kokei** variety had the highest average yield followed **BARI SWEET POTATO 12**, **Pingla**, **BARI SWEET POTATO 4**, **BARI SWEET POTATO 13**, **Bene**, **BARI SWEET POTATO 8**. **Khogene** had the lowest yield (Table 4.16)

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Major Findings

5.1.1 Selected characteristics of the farmers

Age: The middle aged comprised the highest proportion (64.7 percent) followed by young aged category (19.6 percent) and the lowest proportion were made by the old aged category (15.7 percent).

Level of education: Sweet potato farmers under “secondary level of education” constitute the highest proportion (37.2 percent) compared to 27.5 percent “can sign only” category and 7.8 percent above secondary level category, while the lowest 21.6 percent primary education level category and only 5.9 % of the farmers were illiterate category.

Family size: The medium size family constitute the highest proportion (37.25 percent) followed by the large size family (33.34 percent) and only 29.41 percent respondents had small family size.

Land under sweet potato cultivation: The medium land constitutes the highest proportion (69.6 percent) followed by the large land (16.7 percent) and only 13.7 percent respondents had small land under sweet potato cultivation.

Training exposure: The low training constitutes the highest proportion (37.2 percent) followed by the no training (36.3 percent) and only 26.5 percent respondents had medium training.

Cosmopolitaness: The medium levels cosmopolitaness constitutes the highest proportion (54.9 percent) followed by low level cosmopolitaness (21.6 percent) and high level cosmopolitaness (23.5 percent).

Benefit cost ratio: The respondent benefit cost ratio having medium BCR category constitute the highest proportion (65.5 percent) followed by low BCR (16.7 percent) and high BCR (17.8 percent).

Commercialization: The medium levels commercialization constitutes the highest proportion (69.6 percent) followed by low level commercialization (15.7 percent) and high-level commercialization (14.7 percent).

Extension Media contact: The majority (73.6 percent) of the respondents fell in medium contact category followed by 13.7 percent in low contact category and only 12.7 percent in high contact category.

Knowledge on sweet potato cultivation: The majority (69.6 percent) of the respondents fell in medium knowledge category followed by 24.5 percent in low knowledge category and only 5.9 percent in high knowledge category.

Problems faced in sweet potato cultivations: The majority (58.82 percent) of the respondents faced medium problems followed by 22.55 percent low problem category and only 18.63 percent faced high problem in sweet potato cultivation.

5.1.2 Performance of sweet potato cultivation

The observed performance of sweet potato cultivation scores of the farmers in selected cultivation ranged from 16.70 to 26.83 tons/ha. The mean was 21.15. The highest proportion (61.8) percent) of the sweet potato had medium performance while 17.6 percent had high performance and 20.6 percent sweet potato had low performance.

5.1.3 Relationship between selected characteristics of the farmers and their performance of sweet potato cultivation

Among 11 selected characteristics of the farmers 5 characteristics namely, education, training exposure, cosmopolitaness, extension media contact and knowledge on sweet potato cultivation had significant positive relationship with their performance of sweet potato cultivation and the rest 6 characteristics namely, age, family size, land under sweet potato cultivation, BCR, commercialization and problems faced by the farmers in sweet potato cultivation had non-significant relationship with their performance of sweet potato cultivation.

5.1.4 Comparative severity among the problems faced by the farmers in sweet potato cultivation

The observed Problem Faced Index of the problems ranged from 86 to 283 against the possible range of 0-306. On the basis of PFI, it was observed that “high price of fertilizers and pesticides” ranked first followed by “farmers do not get proper price”, “insect and pest attack”, “lack of capital” and “lack of suitable transportation system” were the least problems faced by the farmers sweet potato cultivation.

5.1.5 Compare the performance of different sweet potato varieties

The data revealed that Kokei variety give the highest average yield tons per hectare compared to others. On the other hand, Khogene variety gives lowest yield ton per hectare.

5.2 Conclusions

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

- In the study area the highest proportion (61.8) percent) of the sweet potato had medium performance while 17.6 percent had high

performance and 20.6 percent sweet potato had low performance. Therefore, it may be concluded that performance of sweet potato cultivation was moderate at the study area.

- Education of the farmers had significant positive relationship with their performance of sweet potato cultivation. Majority (64.7%) of the farmers belonged to secondary to can only sign category. Therefore, it may be concluded that, farmers had higher education were more performance of sweet potato cultivation in the study area.
- Training exposure of the farmers showed a significant positive relationship with their performance of sweet potato cultivation. However, considering that most of the farmers belonged under low training category. Therefore, it may be concluded that different training programs should be taken especially for the farmers who have low to no training.
- Cosmopolitaness of the farmers had significant positive relationship with their performance of sweet potato cultivation. Majority (78.4%) of the farmers belonged to medium to high cosmopolitaness. Therefore, it may be concluded that, farmers had higher cosmopolitaness were more performance of sweet potato cultivation in the study area.
- Extension contact of the farmers had significant positive relationship with their performance of sweet potato cultivation. Majority (87.3%) of the farmers belonged to low to medium extension contact. Therefore, it may be concluded that, farmers had higher the extension contact been higher performance of sweet potato cultivation in the study area.
- A great majority (94.1 percent) of the farmers had low to medium knowledge on sweet potato cultivation, while there had a positive

significant relationship with knowledge on sweet potato cultivation of the farmers and their performance of sweet potato cultivation. Therefore, it may be concluded that, farmers had higher knowledge on sweet potato cultivation were more performance of sweet potato cultivation in the study area.

5.3 Recommendations

5.3.1 Recommendations for policy implications

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

- A majority (82.4 percent) of the sweet potato had medium to low performance. All the sample farmers were more or less involved in sweet potato cultivation yet their extent of performance was not satisfactory. Therefore, it may be recommended that necessary steps should be taken to increase the performance of sweet potato cultivation in the study area.
- Education of the farmers had significant positive contribution with their performance of sweet potato cultivation. Therefore, it may be recommended that, adult education should be provided to the farmers so that they could increase their educational level which might be helpful to increase their performance of sweet potato cultivation.
- Training exposure of the farmer had significant positive relationship with their performance of sweet potato cultivation. Therefore, it may be recommended that necessary steps should be taken by the concerned authority, so that the farmers especially those who have no to low training could performance of sweet potato cultivation in a larger scale.
- Cosmopolitaness of the farmers had significant positive relationship with their performance of different sweet potato varieties. Therefore, it

may be recommended that, cosmopolitanness of farmers should be increased their performance of different sweet potato varieties.

- Extension contact of the farmers had significant positive relationship with their performance of sweet potato cultivation. Majority (87.3%) of the farmers belonged to low to medium contact in sweet potato cultivation. Therefore, it may be recommended that, necessary steps should be taken by the extension service providers to increase extension contact of the farmers so that they can improve farming activities which in turn make their performance level high on sweet potato cultivation.
- Knowledge on sweet potato cultivation had significant positive relationship with their performance of sweet potato cultivation. Therefore, it may be recommended that, there should be conducted more extension works for educating and training the farmers which will be supportive to performance of sweet potato cultivation.

5.3.2 Recommendations for further study

- Performance of sweet potato cultivation was conducted in four selected districts. Findings of the study may be verified by similar research.
- The study examined the effects of eleven selected characteristics of the sweet potato farmers. Therefore, it is recommended that further research may be undertaken involving other variable in this regard.
- This study was conducted at 10% level of precision of the population. It would be verified by similar research in other areas of Bangladesh.

- Age, family size, land under sweet potato cultivation, commercialization, benefit cost ratio and problems faced by the farmers in sweet potato cultivation did not show any significant relationship with performance of sweet potato cultivation. Further research is necessary to verify such relationship.
- All problems affect the performance of sweet potato cultivation. There is need for undertaking research on the various problems faced by the farmers which affect their performance.

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Appendix – I

Department of Agricultural Extension and Information System

Sher-e-Bangla Agricultural University, Dhaka-1207

An interview schedule for data collection of the research study entitled

“YIELD PERFORMANCE OF SWEET POTATO CULTIVATION AT FARMERS FIELD”

Serial No.....

Respondent Name:

Village:..... Union:.....

Upazila:.....

District:.....

(Please answer the following questions. Put tick wherever necessary)

1. Age

What is your present age?.....Years.

2. Level of Education

- a) Cannot read and write..... b) Can sign only.....
c) I read up to class d) I passedclass

3. Family member

Please mention the members of your family who are involve in agriculture

- a) Male member person
b) Female member person
c) Total member person

4. Land under sweet potato cultivation.....decimal.

5. Training Exposure

Have you attended any agricultural training programs?

Yes..... No.....

If yes, please mention the following information:

| Sl. No | Name of the training course | Name of the organization | Duration of training (days) |
|--------|-----------------------------|--------------------------|-----------------------------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| | Total | | |

6. Cosmopolitaness

Do you visits in the following places?

| SL. NO. | Place of visit | Extent of visit | | | | |
|---------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|
| | | Regularly (4) | Frequently (3) | Occasionally(2) | Rarely (1) | Not at all (0) |
| 1 | Neighbour villages | ≥6 times/month | 5-6 times/month | 3-4 times/month | 1-2 times\month | 0 times/month |
| 2 | Others union | ≥5 times/month | 4-5 times/month | 3-2 times/month | 1 times/month | 0 times/month |
| 3 | Upazila sadder | ≥4 times/month | 3-4 times/month | 2 times/month | 1 times\month | 0 times/month |
| 4 | Other Upazila sadder | ≥6 times/year | 5-6 times/year | 3-4 times/year | 1-2 times\year | 0 times/year |
| 5 | Own district town | ≥5 times/year | 4-5 times/year | 3-4 times/year | 1-2 times\year | 0 times/year |
| 6 | Other district town | ≥4 times\year | 3 times\ year | 2 times\year | 1 times\year | 0 times\ year |
| | Total | | | | | |

$$7. \text{Benefit cost ratio} = \frac{\text{Income from sweet potato cultivation}}{\text{Cost of sweet potato cultivation}}$$

- a. Income from sweet potato cultivation.....Taka
- b. Cost of sweet potato cultivation.....Taka/hectare.

8. Commercialization

Please mention the following information.

| | Total Yield (kgs) | Unit Price (tk/kgs) | Value of Total yield(tk) | Quantity of sold Potato (kgs) | Value of sold potato (tk) |
|--------------|-------------------|---------------------|--------------------------|-------------------------------|---------------------------|
| Sweet potato | | | | | |
| Total | | | | | |

Commercialization:%

9. Extension Media contact

Please indicate the extent of contact in following sources

| SL. NO | Name of information sources | Extent of contact | | | | |
|--------|--|-------------------|----------------|------------------|------------|----------------|
| | | Regularly (4) | Frequently (3) | Occasionally (2) | Rarely (1) | Not at all (0) |
| 1 | Contact/model farmers | | | | | |
| 2 | Agricultural input (seed / fertilizer / pesticide / equipment) dealers | | | | | |
| 3 | SAAO | | | | | |
| 4 | NGO Worker | | | | | |
| 5 | Upazila level agricultural organization | | | | | |
| 6 | Agricultural program through electronic media (radio/TV) | | | | | |
| 7 | Agricultural features in printing media (daily newspaper, leaflet, booklet, magazine etc.) | | | | | |
| | Total | | | | | |

10. Knowledge on sweet potato cultivation

Please answer the following questions

| SL. NO | Questions | Full Marks (2) | Marks obtained |
|--------|---|----------------|----------------|
| 01 | Which soil is suitable for sweet potato | 2 | |

| | | | |
|-----------|--|----|--|
| | cultivation? | | |
| 02 | Mention two varieties of sweet potato | 2 | |
| 03 | What is the suitable time for sweet potato cultivation? | 2 | |
| 04 | How many times of irrigation is needed for sweet potato cultivation? | 2 | |
| 05 | Mention two insects of sweet potato | 2 | |
| 06 | Mention the recommended dose of fertilizers | 2 | |
| 07 | Mention two disease of sweet potato | 2 | |
| 08 | Name two insecticides/ pesticides which used in sweet potato? | 2 | |
| 09 | Which is the ideal plant spacing for sweet potato cultivation? | 2 | |
| 10 | What is the proper sowing time of sweet potato? | 2 | |
| | Total | 20 | |

11. Problems faced in sweet potato cultivation

Please mention the extent of problems you faced

| Sl. No. | Problems | Extents of problems | | | |
|-----------|---------------------------------|---------------------|--------|-----|------------|
| | | High | Medium | Low | Not at all |
| 1 | Non availability of fertilizes | | | | |
| 2 | Non availability of pesticides | | | | |
| 3 | Lack of capital | | | | |
| 4 | Insect and pest attack | | | | |
| 5 | Adverse climatic condition | | | | |
| 6 | Lack of skilled labours | | | | |
| 7 | Late supply of modern variety | | | | |
| 8 | Farmers do not get proper price | | | | |
| 9 | Malpractices in the market | | | | |
| 10 | Lack of storage facilities | | | | |
| 11 | Long chain of middlemen | | | | |

| | | | | | |
|----|--|--|--|--|--|
| 12 | Lack of suitable transportation system | | | | |
| 13 | Lack of contact by the extension workers | | | | |
| 14 | High price of fertilizers and pesticides | | | | |
| 15 | Lack of irrigation facilities | | | | |

12. Performance of sweet potato varieties

Please provide the following statements:

| SL. NO. | Sweet potato varieties | Area under cultivation | Total yield (kg) | Yield (ton/ha) |
|---------|------------------------|------------------------|------------------|----------------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

Thank you for your kind co-operations

Signature of the interviewer

APPENDIX II

Correlations between dependent and independent variables of the study

| | X ₁ | X ₂ | X ₃ | X ₄ | X ₅ | X ₆ | X ₇ | X ₈ | X ₉ | X ₁₀ | X ₁₁ | Y |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|---|
| X ₁ | 1 | | | | | | | | | | * | |
| X ₂ | .061 | 1 | | | | | | | | | | |
| X ₃ | .134 | .057 | 1 | | | | | | | | | |
| X ₄ | .218* | .407** | .126 | 1 | | | | | | | | |
| X ₅ | -.038 | .206* | .072 | .382** | 1 | | | | | | | |
| X ₆ | .220* | .162 | .222* | .051 | .056 | 1 | | | | | | |
| X ₇ | .083 | .244* | -.213* | .035 | -.020 | -.006 | 1 | | | | | |
| X ₈ | -.037 | .088 | -.092 | .289** | .002 | -.131 | .019 | 1 | | | | |
| X ₉ | .020 | .332** | -.104 | .083 | -.096 | .377** | .142 | .014 | 1 | | | |
| X ₁₀ | .113 | .223* | .267** | .263** | .057 | .523** | .078 | -.004 | .356** | 1 | | |
| X ₁₁ | -.213* | -.192 | -.059 | -.212* | .016 | -.311** | -.042 | -.028 | -.145 | -.269** | 1 | |
| Y | .021 | .344** | .055 | .178 | .341** | .495** | .063 | .002 | .226* | .235* | -.019 | 1 |

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

| | |
|---|--|
| <p>X₁= Age</p> <p>X₂= Education</p> <p>X₃= Family size</p> <p>X₄= Land under sweet potato cultivation</p> <p>X₅= Training Exposure</p> <p>X₆= Cosmopolitaness</p> | <p>X₇= Benefit cost ratio of sweet potato cultivation</p> <p>X₈= Commercialization of sweet potato</p> <p>X₉= Extension Media contact</p> <p>X₁₀= Sweet potato cultivation knowledge</p> <p>X₁₁= Problems faced in sweet potato cultivation</p> <p>Y= Performance on sweet potato cultivation</p> |
|---|--|