PROBLEMS FACED BY THE FARMERS IN FLOATING VEGETABLE CULTIVATION

MD. RAHAD CHOWDHURI

DEPARTMENT OF

AGRICULTURAL EXTENSION & INFORMATION SYSTEM

SHER-E-BANGLA AGRICULTURAL UNIVERSITY

SHER-E-BANGLA NAGAR, DHAKA-1207.

JUNE, 2016

PROBLEMS FACED BY THE FARMERS IN FLOATING VEGETABLE CULTIVATION

BY

MD. RAHAD CHOWDHURI

REGISTRATION NO.: 10-03956

A Thesis

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 (MS)

IN

AGRICULTURAL EXTENSION

SEMESTER: JANUARY - JUNE, 2016

Approved by

……..…..……..….….

(Dr. Md. Humayun Kabir)
Supervisor
Associate Professor
Dept. of Agril. Ext. and Info. System
Sher-e-Bangla Agricultural University

……..……..……

(Dr. Md. Rafiquel Islam)
Co-Supervisor
Professor
Dept. of Agril. Ext. and Info. System
Sher-e-Bangla Agricultural University

……

(Md. Mahbubul Alam, Ph.d)
Assoc. Prof. & Chairman
Department of Agricultural Extension & Information System
Sher-e-Bangla Agricultural University, Dhaka

Department of Agricultural Extension and Information System

Sher-Bangla Agricultural University

Sher-e-Bangla Nagar, Dhaka-1207, Bangladesh.

Memo No.: SAU/AEIS Date:

CERTIFICATE

This is to certify that the thesis entitled, **"PROBLEMS FACED BY THE FARMERS IN FLOATING VEGETABLE PRODUCTION"** 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 (MS) in Agricultural Extension,** embodies the result of a piece of bona fide research work carried out by **Md. Rahad Chowdhuri**, Registration No. 10-03956, under my supervision and guidance. No part of this thesis has been submitted for any other degree or diploma.

I further certify that any help or sources of information, as has been availed of during the course of investigation have been duly acknowledged.

Dated: June, 2016
Dhaka, Bangladesh

……..……..…
(Dr. Md. Humayun Kabir)
Supervisor
Associate Professor
Dept. of Agril. Ext. and Info. System
Sher-e-Bangla Agricultural University

DEDICATION

DEDICATED TO

THIS THESIS IS LOVINGLY DEDICATED TO MY PARENTS AND RESPECTED TEACHERS FOR THEIR ENDLESS SUPPORTS, ENCOURAGEMENT THROUGHOUT MY LIFE.

ACKNOWLEDGEMENTS

All praises, thanks and gratitude are due to the Supreme Ruler of the Universe, the Almighty Allah for his grace bestowed upon the author for accomplishing this research study. With boundless love and appreciation, the researcher would like to extend his heartfelt gratitude and appreciation to all who helped him bring this study into reality.

In particular, the researcher takes the opportunity to express thanks to his respectable supervisor **Dr. Md. Humayun Kabir**, Associate Professor, Department of Agricultural Extension & Information System, Sher-e-Bangla Agricultural University, for his noble guidance, constructive criticism, constant stimulation and encouragement thorough supervision during the course of preparation of this thesis, without which this work would not have been possible. For his unwavering support, I am truly grateful. His insight and practical skill have left a distinct mark on this work.

The author deems it a proud privilege to express his deep sense of gratitude, sincere appreciation and immense thanks to his co-supervisor **Professor Dr. Md. Rafiquel Islam,** Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka, for his continuous guidance, cooperation, constructive criticism and helpful suggestions in carrying out the research work and preparation of this thesis, without his intense co-operation this work would not have been possible.

The researcher also wishes to express sincere appreciation and heartfelt gratitude to **Md. Mahbubul Alam, Ph.D** Associate Professor and Chairman, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, for his valuable suggestions, constant cooperation, inspirations and sincere advice to improve the quality of the thesis throughout the period of this research program.

Heartfelt thanks and appreciations are also expressed to the Upazila Agriculture Officer and SAAO of Nazirpur upazila in the study area for their benevolent help and cooperation in data collection period. The researcher is especially grateful to all the respondents in the study area for their cooperation and help in accomplishing the objectives of this research work.

The researcher expresses heartfelt thanks and sincere appreciations to all other departmental and out of departmental teachers of Sher-e-Bangla Agricultural University for their help and encouragement. Last but not the least, the author expresses his immense indebtedness, deepest senses of gratitude to his beloved parents, brother and sisters who sacrificed all their happiness during the whole study period especially during his MS study.

Finally, the wishes, heartfelt thanks and gratitude to extend to all his relatives, well-wishers especially friends for their inspiration, blessing, cooperation and encouragement in all phases of academic pursuit from the beginning to end.

June, 2016 **The Researcher**

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIX

LIST OF ABBREVIATIONS

Aabbreviation	Full word
Ag. Ext. Ed.	Agricultural Extension Education
Ag. Ext. and Info. Sys.	Agricultural Extension and Information System
AIS	Agriculture Information Service
B	Multiple regression
BBS	Bangladesh Bureau of Statistics
BEC	Bangladesh Economic Census
BRRI	Bangladesh Rice Research Institute
DAE	Department of Agriculture Extension
et. al	All Others
FAO	Food and Agriculture Organization
MoYS	Ministry of Youth and Sports

PROBLEMS FACED BY THE FARMERS IN FLOATING VEGETABLE CULTIVATION

ABSTRACT

The objectives of the study was to determine the extent of problems faced by the farmers in floating vegetable cultivation and to explore the contribution of the selected characteristics of the cultivators to their problems in floating vegetable cultivation. The study was conducted in selected villages of Dirgha and Kolardoyania union of Nazipur upazila in Pirojpur district. Data were collected from 107 floating vegetable cultivators from 24 March, 2017 to 26 April, 2017. Descriptive statistics, multiple regressions (B) were used for analysis. The highest (54.2 percent) of the respondent had medium problem faced in floating vegetable cultivation followed by (23.4 percent) had high problem faced and (22.4 percent) had low problems in floating vegetable cultivation. As per Problems Faced Index (CFI), initial cost is high positioned the 1st and low demand in the local market in last position. Among the independent variables- education, area under floating vegetable cultivation, experience in floating vegetable cultivation, time spend in floating vegetable cultivation, media exposure and knowledge on floating vegetable cultivation were found significant contribution. The 65.1 percent ($R^2 = 0.651$) variation of the multiple regression model was satisfactory. So, care should be taken about above mention significant factors to increase the floating vegetable cultivation area.

Key words: Problems, floating vegetable cultivation, Pirojpur district;

CHAPTER 1

INTRODUCTION

1.1 General Background

Bangladesh is situated in the lowest riparian region of the Ganges-Brahmaputra-Meghna River basins. In the wetlands of southern Bangladesh (parts of Gopalganj, Pirojpur and Barisal districts), local communities have difficulties in securing farmlands to provide food and livelihoods during the monsoon season (from June to October). Flood is a regular phenomenon in Bangladesh. During the last 50 years, at least seven big floods affected 35-70% of Bangladesh (Irfanullah et al ,2011). These vulnerable, marginalized communities are constrained by not having cropping space in terms of access to and/or ownership of land. In that season, these areas have been repeatedly affected by cyclones, heavy rainfall, flooding, salt damage caused by sea level rise and snow melting from the Himalayas, resulting in extremely low agricultural production. Even after the flooding is over, farmlands remains submerged for a while due to poor drainage capacity. Farmers cannot manage to cultivate any crops on the submerged farmlands. For that reason, many local populations are in poverty and hunger during that time. Floating cultivation can help to mitigate this situation and reduce the pressure on arable lands by turning the flooded and waterlogged areas into productive ones (Haq et al. 2004).

In this context, local communities didn't chose the way to conquer this sever environment, but chose the way to cope with the surrounding nature. Farmers have developed the unique floating garden agricultural practices (locally known as "Dhap") to rear plants and crops in nutrient supplemented water without soil. Dhap is a kind of hydroponics. This system employs the floating beds on the surface of water as the foundation of growing plants and crops without soil. Aquatic plants such as Tapapana, Dulalilata, Khudipana were used to construct floating beds dated back a few thousand years. The production system is the major livelihood option for about 60-90% (varies from community to community) of the people of local communities in this region.

The floating agriculture practice in the southern parts of the country represents a traditional/indigenous agriculture system for the water logged or the submerged area in Bangladesh.The people of the southern parts of Bangladesh adopted the practice based on their traditions and the community's culture and wisdom. Floating gardens are amongst the many options developed and promoted to address the needs of poor farmers in Bangladesh combining to make a real difference to production levels.

The floating-bed technique also has some positive social impacts. It involves both men and women, thereby improving the gender balance, as well as people's perception of particular areas as suitable places to live. People who are practicing floating-bed cultivation are enjoying a better life economically, than those in other flood-affected areas who have not yet adopted this practice.

This cultivation practice helps to supplement people's income, which contributes towards the alleviation of poverty, and provides greater food security by increasing the landholding capacity of poor as well as landless people by allowing them to grow vegetables and crops with lower input costs, due to the minimum infrastructure required (Irfanullah et. al., 2007) First, during monsoons, when most of the land is flooded, floating agriculture is the only alternative method of cultivation. In the monsoon (mainly during June-August), farmers cultivate ladies finger (okra), cucumber, snake gourds etc. on the floating system. After the monsoon, farmers use this for cultivating spinach, aurum, spices and several other vegetables. During the monsoon, farmers use small boats to manage the floating agricultural land.

The main objective of the practice is sustainable local natural resource management (submerged areas) through floating agriculture practices. A second objective is to cope with the climate change situation. Considering both objectives, the researcher felt necessary to conduct research on **"Problem faced by the farmers in floating vegetable cultivation".**

1.2 Statement of the problem

Bangladesh, basically an agro-based country, is considered one of the world's most densely populated countries (964 persons per square km) with an annual population

growth rate of 1.2 percent (BBS, 2016). In such setting, the pressure on the land for agricultural production and the demand for job is increasing day by day. There is a lack of cultivable land in our country. We are not able to produce enough vegetables for our people. So floating vegetable cultivation can be a better way to produce enough vegetables for our people and a better way of earning for the peoples of the lowland areas.

In view of the need for having an understanding of the farmers problem in floating vegetable cultivation, the investigator, undertook this piece of research entitled **"Problem faced by the farmers in floating vegetable cultivation"** the purpose of this study is to ascertain the extent of problem confrontation in floating vegetable cultivation. Considering the nature of study the researcher sought information regarding following research questions:

1. What are the problems being confronted by the farmers in floating vegetable cultivation?

2. What are characteristics of the floating vegetable cultivating farmers?

3. What are the contribution of the selected characteristics of the farmers on the problem confrontation by them in floating vegetable cultivation?

1.3 Specific Objectives

The following specific objectives were formed to give proper direction to the study:

1. To assess the extent of problems faced by the farmers in floating vegetable cultivation.

2. To describe the following selected characteristics of floating vegetable farmers:

i. Age

ii. Education

iii. Family size

iv. Area under floating vegetable cultivation

v. Annual on farm income

vi. Annual off farm income

vii. Experience in floating vegetable cultivation

viii. Training exposure

ix. Time spent in floating vegetable cultivation

x. Media exposure

xi. Knowledge in floating vegetable cultivation

3. To explore the relationship between the selected characteristics of the floating vegetable cultivators and their problem confrontation.

1.4 Scope of the study

The present study was designed to have an understanding of the problem confrontation of the farmers in floating vegetable cultivation and to explore its relationship with their selected characteristics.

The findings of this study will be particularly applicable to the farmers of the respective study area. The findings may also have applicability to other areas of the country when the physical, socio-economic and cultural conditions are mostly similar with those of the study area. However, the findings of the study will be helpful for the specialist of different organizations and planners, policy makers and extentionists in removing problem confrontation by the farmers in floating vegetable cultivation.

1.5 Limitation of the study

The present study was undertaken with a view to have an understanding of the problem confrontation by the farmers in floating vegetable cultivation. Considering the time, money and other necessary resources available to the researcher and also to make the study meaningful and manageable the researcher had to impose certain limitations as follows:

i. The study was confined to ten villages of Nazirpur upazilla under Pirojpur district.

ii. The study was confined mainly to problem confrontation of the farmers in floating vegetable cultivation.

iii. Out of many characteristics of floating vegetable cultivators only twelve characteristics of farmers' were selected for investigation in this study.

iv. For information about the study, the researcher was depended on the data furnished by the selected respondents during data collection.

v. The respondents for data collection were kept limited within the heads of farm families.

vi. Various problems in adopting floating vegetable cultivation were likely to be confronted by the farmers. However, only 16 problems have been considered for investigation in his study.

1.6 Assumption of the study

The researcher had the following assumptions in mind while undertaking this study:

1. The respondents included in the sample for this study were competent enough to furnish proper responses to the queries included in the interview schedule.

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

3. The responses furnished by the respondents were valid and reliable.

4. Views and opinions furnished by the floating vegetable growers included in the sample were the representative views and opinions of the whole population of the study area.

5. The findings of the study might have general application to other parts of the country with similar personal, socio-economic and cultural condition of the study area.

1.7 Definition of the terms

Age

Age of a farmer is defined as the period of time from his birth to the time of interview of the farmers.

Education

Education referred to the desirable change in knowledge, skill and attitude of an individual, through reading, writing and other related activities. It was measured in terms of years of schooling of an individual.

Family size

Family size of a farmer was defined as the number of individuals in his family including himself, his wife, children and other dependent members.

Floating vegetable cultivation area

It refers to the area owned by the farmer on which he cultivated floating vegetable during the season of collection of data for this study.

Annual farm income

It refers to the total income earned by the farmer himself and the members of his family from agriculture, livestock, and fisheries. It was expressed in taka.

Annual off farm income

It refers to the total income earned by the farmer himself and the members of his family from business, service, labor etc. It was also expressed in taka.

Training exposure

It referred to the total number of days that a respondent received training in his entire life from different organizations under different training programmes.

Media exposure

Media exposure is the degree to which an individual's exposure to or contact with different communication media and sources and personalities being used for dissemination of new technologies among the floating vegetable cultivators.

Time spent

It referred to the average number of hour per day a respondent uses in floating vegetable cultivation.

Knowledge on floating vegetable cultivation

Knowledge is the degree to which an individual knows about a subject fact, person etc. knowledge on floating vegetable cultivation. It refers to farmers understanding of different aspect of floating vegetable cultivation. It refers to farmer's understanding of different aspect of floating vegetable cultivation.

Problem confrontation in floating vegetable cultivation

Problem confrontation in floating vegetable cultivation refers different problem as perceived by the farmers in cultivating floating vegetable.

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this chapter is to review the researches conducted in line of the major focus of study. This study as already indicated, was undertaken to have an understanding of the problems faced by the farmers in floating vegetable cultivation and its relationship with the selected characteristics. Literature having relevance to the present study has been reviewed in three sections. The first section deals with the literature on the constraints faced by the farmers in cultivating various crops and the second section deals with review of studies dealing with the relationships between selected characteristics and faced constraints in potato cultivation. The third section deals with the conceptual framework of the study. However, the available reviews of literatures in connection with this study are briefly discussed below:

2.1 Studies on Constraints Faced by the Farmers in various Crops

Mortuza (2015) revealed that more than two thirds (67.10 percent) of the respondents faced medium problem in maize production activities and 19.50 percent faced low problems and 13.40 percent faced high problems.

Rahman (2015) revealed that more than half (67.4 percent) of the respondents faced medium problem in jackfruit commercialization activities, while 18.6 percent faced high problems and only 14 percent faced low problems.

Baten (2014) found that the majority (73.3 percent) of the farmers faced medium problem in cotton cultivation, while 16.4 percent low and 10.3 percent high problem in cotton cultivation.

Ali (2014) found that the highest 56.12 percent betel leaf farmers belongs to the group of medium problem confrontation and the lowest percentage 20.42 percent in high problem confrontation.

Uddin (2004) in his study identified five aspect of constraints in commercial cultivation of vegetables viz. seed constraints, disease and insect infestation constraints, field management constraints, marketing of vegetable constraints and

extension work constraints. Among these aspects of constrains he revealed disease and pest infestation constraints severely faced by the farmers.

Salam (2003) in his study identified constrains in adopting environmentally friendly farming practices. Top six identified constraints according to their rank order were: (i) low production due to limited use of fertilizer (ii) lack of organic matter in soil, (iii) lack of Govt. support for environmentally friendly farming practices, (iv) lack of capital and natural resources for integrated farming practices, (v) lack of knowledge on integrated farm management and (vi) unavailability of pest resistant varieties of crops.

Rahman (1995) in this study, identified farmers' faced problems in cotton cultivation. Non-availability of quality seed in time unfavorable and high cost of fertilizer and insecticides, lack of operating capital, not getting fair weight and reasonable price according to grade, affects of cattle in cotton field, lack of technical knowledge, lack of storage facility, stealing from field at maturity stage, and late buying of raw cotton by Cotton Development Board were identified as major problems of cotton farmers in Mymensingh district.

Freeman and Berth (1994) conducted a study on issues in African Rural Development Study showed several constrains in farming practices such as intensified land use, fallow periods decline and crop cultivation spreads into marginal or ecologically fragile lands. In the absence of appropriate resource management technologies, these practices inevitably lead to degradation of the resource base with important implications for soil productivity, household food security and rural poverty.

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

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

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

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

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

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

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

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

Salam (2003) in his study identified constrains in adopting environmentally friendly farming practices. Top six identified constraints according to their rank order were: (i) low production due to limited use of fertilizer (ii) lack of organic matter in soil, (iii) lack of Govt, support for environmentally friendly farming practices, (iv) lack of capital and natural resources for integrated farming practices, (v) lack of knowledge

on integrated farm management and (vi) unavailability of pest resistant varieties of crops.

Halim (2003) conducted a study on constraints faced by the farmers in adopting to their rank order were: (i) lack of storage facilities for products and seeds, (ii) high price of inputs, (iii) non-availability of credit for other crops, (iv) lack of sufficient training programme in different aspects of crop diversification and (v) most of the lands are in low lying areas and not suitable for CDP crops.

Ismail (2001) conducted a study on farm youth of haor area of Mohangonj upazila. Study revealed that there were six top problems in rank order were (i) no arrangement of loan for the farm youth for fishery cultivation, (ii) lack of government programmes in agriculture for the farm youth, (iii) absence of loan giving agencies for establishing farm in 1-10 daily, (iv) general people face problem for fishery due to government leasing of Jalmohal, lack of government programmes for establishing poultry farm, (vi) lack of agricultural loan for the farm youth.

Pramanik (2001) made an extensive, study on the twenty-four problems of farm youth in the villages of Mymensingh districts relating to different problems in crop cultivation. Out of twenty-four problems tile top four problems in rank order were, i) local NGO take high rate of interest against a loan, ii) lack of agricultural machinery and tools, iii) lack of cash and iv) financial inability to arrange improved seeds, fertilizers and irrigation.

Chander et al. (1990) in their study identified constraints in potato cultivation. Main constraints were ignorance about improved cultivars and cultivation practices, ignorance about time and number of irrigation, ignorance about scientific method of sowing, lack of guidance of marketing of potato, high cost of improved cultivars, high cost of fertilizers, pesticides and irrigation, lack of enough space for storing potatoes scientifically.

Gumisiriza et al. (1994) showed several constraints of wheat production in Uganda. These were: traditional farming practices, unavailability or lack of improved cultivars,

information and technology transfer, rusts and foliar disease and in effected communication between research stations.

2.2 Relationship between selected characteristics of the farmers and their problem Confrontation

2.2.1 Age and problem confrontation

Rahman (1995) conducted a study to identify the relationship between the personal characteristics and constraints facing in cotton cultivation of Muktagacha Thana under Mymensingh district. He found that there was no significant relationship between the age of the farmers and their faced constraints in cotton cultivation. Similar findings were obtained by Ali (1999), Rashid (1999), Pramanik (2001), Ahmed (2002), Hossain (2002), Salam (2003) and Halim (2003) in their respective studies.

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

Akanda (1993) found that there was no relationship between age of farmers and their problem faced in using quality rice (BR 11) seed.

Karim (1996) conducted a study and found that age had no significant relationship with problem faced.

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

Aziz (2006) found that age of the farmers had no significant relationship with their constraints faced in potato cultivation in Jhikargacha upazilla under Jessore district

2.2.2 Education and problem confrontation

Mansur (1989) found that education of the farmers had significant negative effect on their problem confrontation in feeds and feeding cattle. Similar findings were obtained by Rahman (1995), Haque (1995), Rahman (1996), Karim (1996), Faruque (1997), Pramanik (2001), Ahmad (2002), Hossain (2002), Bhuiyan (2002) and Salam (2003) in their respective study.

Nahid (2005) conducted a study and found that there was very high significant negative relationship between education of the cotton growers and their problem confrontation in cotton production.

The study of Ismail (2001) revealed that there was no significant relationship between education and problem confrontation of farm youth. Similar findings were obtained by Halim (2003) in their respective studies. Thus, it could be concluded that an overwhelming majority of the researches found a negative relationship between these two variables.

Aziz (2006) found that education of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhicargachaupazilla under Jessore district.

2.2.3 Family size and problem confrontation

Haque (1995) found that there was no significant relationship between family size and problem confrontation of the Mohila Bittaheen Samabaya Samittee. Similar findings were obtained by Rashid (1999), Bhuyan (2002), Hossain (2002) and Ahmed (2002) in their respective studies.

Salam (2003) in his study found a positive significant relationship between family size and their constraint in adopting environment friendly farming practices.

Nahid (2005) conducted a study and found that there was no significant relationship between family size of the sugarcane growers and their problem confrontation in sugarcane production .

Hossain (1985) found in his study that there was no relationship between family size of the landless laborers and their problem faced.

Haque (2006) found that family size of the farmers had no significant relationship with their problem faced in using integrated plant nutrient management

2.2.4 Annual family income and problem faced

Nahid (2005) conducted a study and found that there was a very high significant negative relationship between annual income of the cotton growers and their problem confrontation in cotton production.

Haque (2006) found that annual family income of the farmers had no significant relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that annual family income of the farmers had very high negative significant relationship with their constraints faced in Banana cultivation of Sunargaon Upazilla under Narayangonj district. Aziz (2006) found the same.

Bashar (2006) found that annual family income high significant negative relationship with problem confrontation in mushroom cultivation.

Hague (2001) found in his study that annual income of FFS farmers had a positive significant effect on their problem confrontation.
Hossain (1985) found a significant positive relationship between income of the farmers and constraints faced of the landless laborers.

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

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

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

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

2.2.5 Training exposure and problem confrontation

Nahid (2005) conducted a study and found that there was no significant relationship between training exposure of the sugarcane growers and their problem confrontation in sugarcane production.

Bashar (2006) found that training exposure of the farmers had high significant negative relationship with their problem confrontation in mushroom cultivation

Anwar (2005) found that rural faced various problems in training and the top three problems in rank order were: i) no arrangement of training on rural and agricultural development of the upazila. ii) no scope to have training on improved practices, iii) no arrangement for vocational training in the upazila.

Ahmed (2002) showed that training experience of the farmers had a significant negative relationship with their problem confrontation in jute seed production.

Saha (1997) found that training experience of the youth had no relationship with their problem confrontation.

2.2.6 Media exposure and problem confrontation

Ali (1984) found that contact and non-contact farmers differed significantly in respect of their extension contact. He observed that extension contact of the contact and non-contact farmers had significant contribution toward their agricultural knowledge.

Rahman(1995) in his study conducted that extension contact of the farmers had significant negative relationship with their faced constraints in cotton cultivation. Similar findings were obtained by Rahman (1996), Faroque (1997), Pramanik (2001), Hossain (2002), Bhuyian (2002), Ahmed (2002), Salam (2003) and Halim (2003) in their respective studies.

The study of Ismail (2001) revealed that there was not significant relationship between farm youths extension contact and their agricultural problem confrontation. Similar findings were obtained by Raha (1989) and Hoque (2001) in their respective studies.

Nahid (2005) conducted a study and found that there was a very high significant negative relationship between extension media contact of the sugarcane growers and their problem confrontation in sugarcane production.

Huque (2006) found that extension media contact of the farmers had high significant negative relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that extension media contact of the farmers had no significant relationship with their constraints faced in Banana cultivation of Sunargaon Upazilla under Narayangonj district.

Bashar (2006) found that extension media contact of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

Aziz (2006) found that extension media contact of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhikargacha upazilla under Jessore district.

2.2.7 Knowledge and problem confrontation

Raha (1989) reported from his study that farmers knowledge in irrigated modem boro paddy had no significant relationship with their irrigation problem confrontation. Anwar (1994), Karim (1996), Rashid (1999), Islam (2001), Salam (2003) and Rashid (2003) found similar in their respective studies.

Sarker (1983) showed that there was a negative significant relationship between education and poultry knowledge of the farmers and their poultry problem confrontation, while Islam (1987), in his study found that knowledge regarding utility of artificial insemination of the farmers is positively related to their artificial insemination problem confrontation.

Nahid (2005) conducted a study and found that there was no significant relationship between cotton cultivation knowledge of the cotton growers and their problem confrontation in cotton production.

Haque (2006) found that knowledge of the farmers had significant negative relationship with their problem faced in using integrated plant nutrient management.

Rahman (2006) found that knowledge of the farmers had no significant relationship with their constraints faced in Banana cultivation of Sunargaon Upazilla under Narayangonj district.

2.3 The conceptual framework of the study

It is evident from the past studies that every occurrence or phenomenon is the outcome of a number of variables, which may or may not be interdependent or

interrelated with each other. In other words, no single variable can contribute wholly to a phenomenon. Variables together are the cause and the phenomenon is effect and thus, there is cause- effect relationship everywhere in the universe.

The conceptual framework of Rosenberg and Holland (1960) was kept in mind while framing the structural arrangement for the dependent and independent variables. The present study was concerned with the problem confrontation by the farmers in floating vegetable cultivation. Thus the problem confrontation was the main focus of the study and constituted the dependent variable. The characteristics of the farmers were considered as the independent variables. It is not possible to deal with the characteristics in a single study. It was therefore, necessary to limit the characteristics, which include age, education, area under floating vegetable cultivation, family size , experience in floating vegetable cultivation, annual income, training exposure, media exposure, time spent and knowledge on floating vegetable cultivation.

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

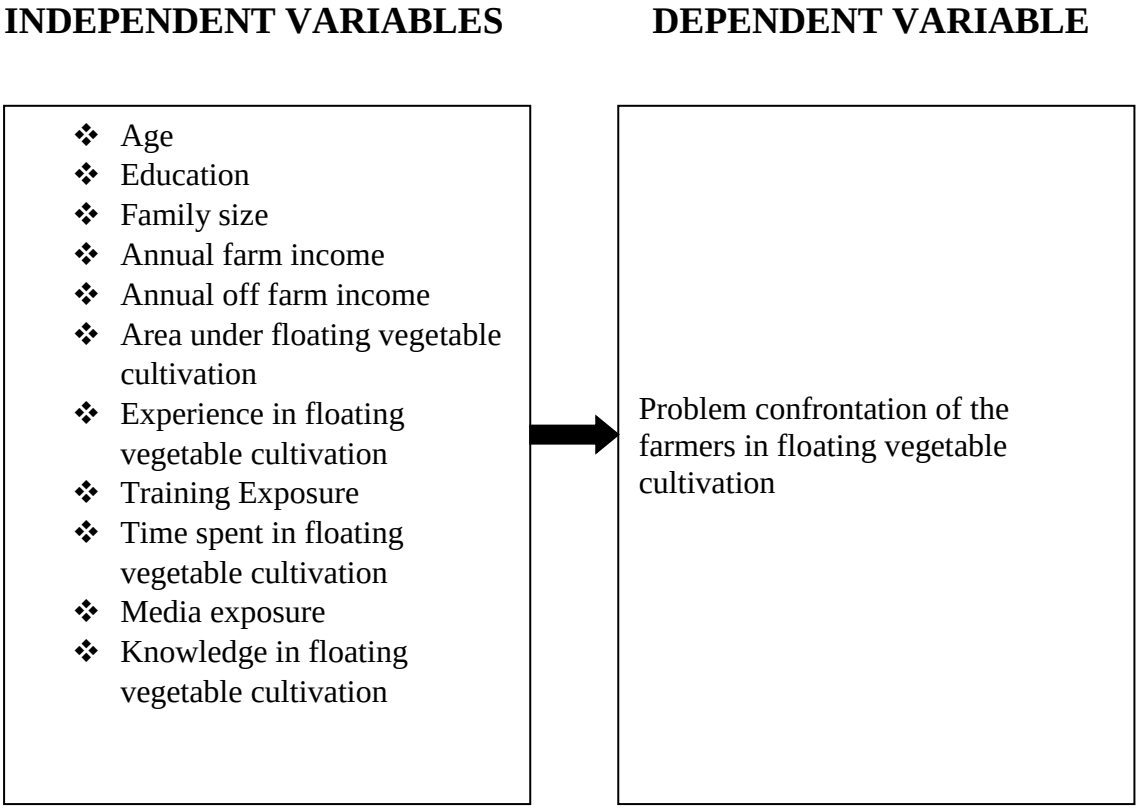

Fig: 2.1 A Conceptual Framework of the Study

CHAPTER III

MATERIALS AND METHODS

Methods play an important role in a scientific research. To fulfill the objectives of the study, a researcher should be very careful while formulating methods and procedures in conducting the research. According to Mingers (2001), research method is a structured set of guidelines or activities to generate valid and reliable research results. This chapter of the thesis illustrates the research methods and procedures used to collect and analyze the data for answering the research questions and attaining the purposes. The methods and operational procedures followed in conducting the study e.g. selection of study area, sampling procedures, instrumentation, categorization of variables, collection of data, measurement of the variables and statistical measurements. A chronological description of the methodology followed in conducting this research work has been presented in this chapter.

3.1 Locale of the study

The study was conducted in the Nazirpur upazila under Pirojpur district. The area of Nazirpur upazila (Pirojpur district) is 233.63 sq km, located in between 22°40' and 22°52' north latitudes and in between 89°52' and 90°03' east longitudes. It is bounded by Tungipara, Kotalipara and Uzirpur upazilas on the nortn, Pirojpur sadar and Kachua (Bagerhat) upazilas on the south Nesarabad and Banaripara upazilas on the east, Chilmari on the west. The features of the farmers and agriculture at Nazirpur upazila are like- main sources of income agriculture 70.02%, Ownership of agricultural land- Landowner 76.10%, landless 23.90%; agricultural landowner: urban 67.88% and rural 76.30%; main crops Paddy, wheat, sugarcane, pulse, sweet potato, vegetables, chilli etc. Nazirpur upazila has several unions in which Dirgha and Kolardoyania union was selected randomly as the study area.

The present study was conducted at Nazirpur upazila based on the population size in the selected area. The farmers of the study area are involved in floating vegetable cultivation. The number of farmers who involves in floating vegetable cultivation in the study area are 3398.

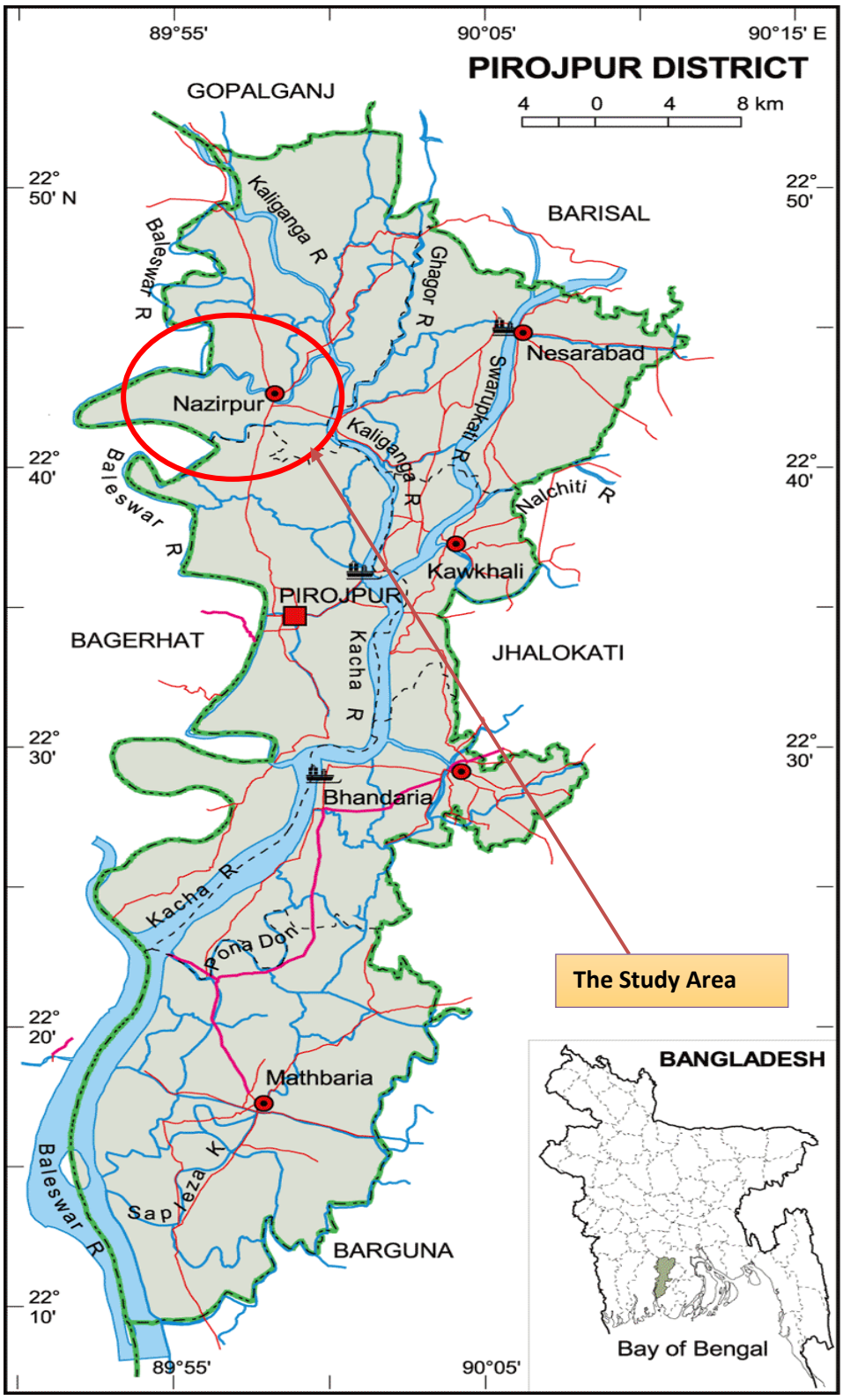

Figure 3.1 Map of Pirojpur district showing the study area -Nazirpur

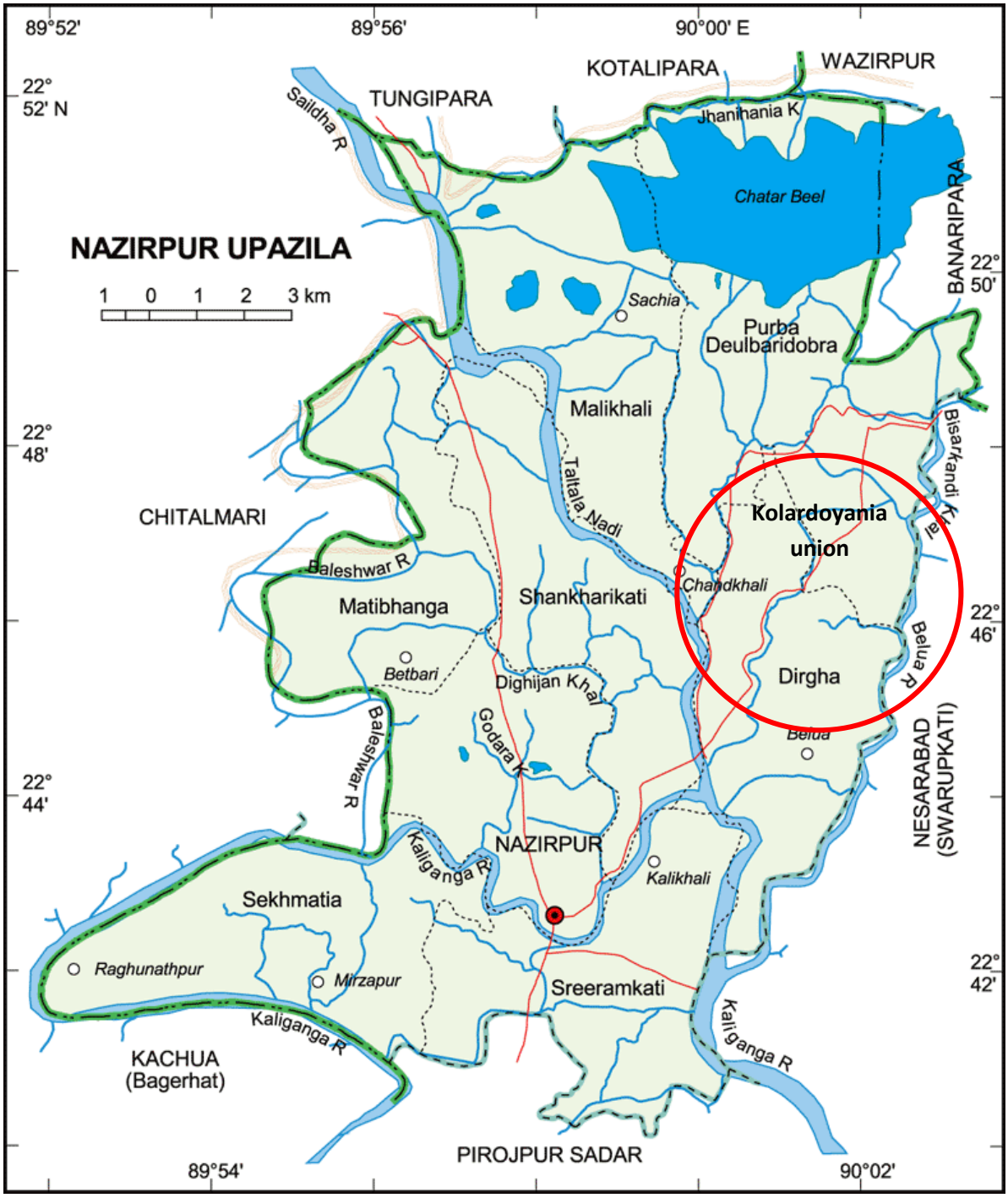

Figure 3.2 Map of Nazirpur upazila showing the study area- Kolardoyania and Dirgha union

3.2 Population and sample of the study

People who permanently reside in the selected villages of Dirgha and Kolardoyania union and cultivate floating vegetable were constituted the active population of this study. The head of the farm families of vegetable cultivators of Dewolbari, Dobra, Malikhali, Mugharjhore of Dirgha union and Kolardoyania, Boithakatha, Pakuria, of Kolardoyania union of Nazirpur upazila under Pirojpur district were the population of the study. However, representative sample from the population were taken for collection of data following random sampling technique. One farmer (who mainly operated the floating vegetable cultivation) from each of the farm families was considered as the respondent. Updated lists of all vegetable farmers of the selected villages were prepared with the help of SAAOs and local leaders. A purposive sampling procedure was followed to select one district from the whole of Bangladesh, and the same method was used to select the area of the district as well as the villages as the study group. The total number of floating vegetable farmers of the selected villages were 214; where 38 farm family heads from Dewolbari, 26 farm family heads from Dobra, 31 farm family heads from Malikhali, 35 farm family heads from MugharJhore of Dirgha union and 25 farm family heads from Kolardoyania, 32 farm family heads from Boithakatha, 27 farm family heads from Pakuria, of Kolardoyania union which constituted the population of the study. Thus, 214 farmers constituted the population of the study which is shown in the following Table 3.1.

Table 3.1 Population of the study area

Name of the selected upazila	**Name of the selected union**	**Name of the selected area**	**Number of the respondents**
Nazirpur upazila	Dirgha	Dewolbari	38
		Dobra	26
		Malikhali	31
		Mugharjhore	35
	Kolardoyania	Kolardoyania	25
		Boithakatha	32
		Pakuria	27
		Total	214

3.2.1 Determination of sample size

The population size for the study was 214. As the population size is small, therefore the researcher followed percentage method rather than standard statistics formula (Yamane, 1967). The fifty percent (50%) of the population size was considered as sample of the study. So, the sample size (n) was = 107.

3.2.2 Distribution of the population, sample size and reserve list

According to taken a representative percentage of population, the respondents comprised of 107 farmers. A reserve list of 11 vegetable cultivators (ten percent of the sample size) were also prepared so that the farmers of this list could be used for interview if the farmers included in the original sample were not available at the time of conduction of interview. The floating vegetable farmers of the selected villages were measured according to the proportionate of the total sample size. The distribution of the population, the number of sample size and number of respondents along with the reserve list are given in the following Table 3.2.

Table 3.2 Distribution of the vegetable cultivators according to population and reserve list

Selected upazila	Selected union	Selected villages	Population	Sample size	Reserve list
Nazirpur upazila	Dirgha	Dewolbari	38	19	2
		Dobra	26	13	1
		Malikhali	31	16	2
		Mugharjhore	35	17	2
	Kolardoy-ania	Kolardoyania	25	12	1
		Boithakatha	32	16	2
		Pakuria	27	14	1
Total			214	107	11

3.3 Data collection tools

Structured interview schedules were prepared to reach the objectives of the study. The schedule was prepared containing open and closed form of questions. The open questions allowed for the respondents to give answers using their own language and categories (Casley and Kumar, 1998). The questions in this schedule were formulated in a simple and unambiguous way and arranged in a logical order to make it more attractive and comprehensive. The instruments were first developed in English and then translated into Bengali. The survey tools were initially constructed based on an extensive literature reviews and pre-tested. The schedule was pre-tested with 15 randomly selected floating vegetable cultivators in the study area. The pre-test was helpful in identifying faulty questions and statements in the draft schedule. Thus, necessary additions, deletions, modifications and adjustments were made in the schedule on the basis of experiences gained from pre-test. The questionnaires were also checked for validity by supervisor and educational experts at Sher-e-Bangla Agricultural University (SAU). Finally, based on background information, an expert appraisal and the pre-test, the interview schedule was finalized. Data was gathered by the researcher personally. During data collection, necessary cooperation was obtained from field staff of different GOs and NGOs and local leader. The primary data were collected from 10 March to 15 March, 2017. Books, journals, reports and internet documents were used as secondary sources of data supporting or supplementing the empirical findings of the study. The final data collection was started from 24 March and completed in 25 April, 2017.

3.4 Variables and their measurement techniques

The variable is a characteristic, which can assume varying, or different values in successive individual cases. A research work usually contains at least two important variables viz. independent and dependent variables. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variable (Townsend, 1953). In the scientific research, the selection and measurement of variable constitute a significant task. Following this conception, the researcher reviewed literature to widen this understanding about the natures and

scopes of the variables relevant to this research. At last he had selected 11 independent variables and one dependent variable. The independent variables were: age education family size area under floating vegetable cultivation on farm income of farm income experience in floating vegetable cultivation training exposure time spends in floating vegetable cultivation media exposure knowledge on floating vegetable cultivation. The dependent variable of this study was the 'problem faced in floating vegetable cultivation'. The methods and procedures in measuring the variables of this study are presented below:

3.4.1 Measurement of independent variables

The 11 characteristics of the floating vegetable farmers mentioned above constitute the independent variables of this study. The following procedures were followed for measuring the independent variables.

3.4.1.1 Age

Age of the farmers was measured in terms of actual years from their birth to the time of the interview, which was found on the basis of the verbal response of the rural people (MoYS, 2012). A score of one (1) was assigned for each year of one's age. This variable appears in item number 1 in the interview schedule as presented in Appendix-I.

3.4.1.2 Education

Education was measured by assigning score against successful years of schooling by a farmer. One score was given for passing each level in an educational institution (Rashid, 2014).

For example, if a farmer passed the final examination of class five or equivalent examination, his/her education score has given five (5). Each farmer of can't read and write has given a score of zero (0). A person not knowing reading or writing but being able to sign only has given a score of 0.5. If a farmer did not go to school but took non-formal education, his educational status was determined as the equivalent to a formal school student. This variable appears in item number 2 in the interview schedule as presented in Appendix-I.

3.4.1.3 Family size

Family size of a farmer was determined by the total number of members in his/her family including him/her, children and other dependents. The scoring was made by the actual number of family members expressed by the farmers. For example, if a farmer had five members in his/her family, his/her score was given as 5. This variable appears in item number 3 in the interview schedule as presented in Appendix-I.

3.4.1.4 Area under floating vegetable cultivation

Area under floating vegetable cultivation of a farmer referred to the total area of land on which his/her family carried out the floating vegetable cultivation, the area being in terms of full benefit to the family. The data was first recorded in terms of measurement unit i.e. decimal. This variable appears in item number four (4) in the interview schedule as presented in Appendix-I.

3.4.1.5 On farm income

The term on farm income refers to the annual gross income of farmer and the members of his family from farming sources. It was expressed in taka. In measuring this variable, total earning taka of an individual farmer was converted into score. A score of one was given for every one thousand taka. This variable appears in item number 5 (five) in the interview schedule as presented in Appendix-I.

3.4.1.6 Off farm income

The term off farm income refers to the annual gross income of farmer and the members of his family from different sources except farming sources. It was expressed in taka. In measuring this variable, total earning taka of an individual farmer was converted into score. A score of one was given for every one thousand taka. This variable appears in item number 6 (six) in the interview schedule as presented in Appendix-I.

3.4.1.7 Experience in floating vegetable cultivation

Experience in floating vegetable cultivation of the farmer was determined by the total number of year involved in floating vegetable cultivation. A score of one (1) was

assigned for each year floating vegetable cultivation. This variable appears in item number 7 in the interview schedule as presented in Appendix-I.

3.4.1.8 Training exposure

Training exposure of farmers was determined by the total number of agricultural training received in his/her life regarding farming activities**.** A score of one (1) was assigned for each type of training attended. This variable appears in item number eight (8) in the interview schedule as presented in Appendix-I.

3.4.1.9 Time spent in floating vegetable cultivation

Time spent in floating vegetable cultivation was determined by the total of time involved in floating vegetable cultivation per week. A score of one (1) was assigned for each hour floating vegetable cultivation activities. This variable appears in item number 9 in the interview schedule as presented in Appendix-I.

3.4.1.10 Media exposure

It was defined as one's extent of exposure to different communication media related to floating vegetable cultivation. Media exposure of farmers was measured by computing media exposure score on the basis of their nature of media exposure with nine media. Each farmer was asked to indicate his nature of media exposure with five alternative responses, like regularly, often, occasionally, rarely and not at all basis to each of the nine media and score of four, three, two, one and zero were assigned for those alternative responses, respectively. Logical frequencies were assigned for each of the four-alternative nature of contact. Media exposure of the farmers was measured by adding the scores of nine selected source of information. Thus, media exposure score of a farmer could range from 0 to 36, where zero indicated no media exposure and thirty-six indicated highest level of media exposure. This variable appears in item number 10 in the interview schedule as presented in Appendix-I.

3.4.1.11 Knowledge on floating vegetable cultivation

Floating vegetable cultivation knowledge of farmers was measured by asking him/her 10 questions related to different components of floating vegetable cultivation. It was measured assigning weight age two on each question. So, the total assigned scores for

all the questions became twenty. The score was given according to response at the time of interview. Answering a question correctly an individual could obtain full score. While for wrong answer or no answer he obtained zero (0) score. Partial score was assigned for partially correct answer. Thus, the agricultural knowledge score of a farmer could range from zero (0) to twenty (20), where zero indicates no knowledge and twenty indicates highest knowledge on vegetable production technologies. This variable appears in item number eleven (11) in the interview schedule as presented in Appendix-I.

3.4.2 Measurement of dependent variable

Problem faced in floating vegetable cultivation of a respondent was dependent variable of the study and it was determined by providing score. Problem faced in floating vegetable cultivation of a farmer was measured by computing problem score on the basis of their nature of problems. Each farmer was asked to indicate his nature of problems in floating vegetable production with 4-point rating scale, like high, medium, low and not at all basis to each of the sixteen problems and score of three, two, one and zero were assigned for those alternative responses, respectively. These four options for each medium were defined specially to each medium considering the situation, rationality and result of pre-test. Logical frequencies were assigned for each of the four -alternative nature of problems in vegetable cultivation. Input problems of the farmer was measured by adding the scores of eight selected input problems. Thus, input problems score of a farmer could range from 0 to 48, where zero indicated no problem and forty-eight indicated highest level of problem faced in floating vegetable cultivation. This variable appears in item number 12 in the interview schedule as presented in Appendix-I. Based on the available information cited by the farmers, they were classified into three categories (Mean ± Standard Deviation) namely ‘low’, ‘medium’ and ‘high’ problem faced in floating vegetable cultivation.

3.5 Rank order of problems faced by the vegetable farmers

To ascertain the best problems faced by the floating vegetable farmers’ strategies Problems Faced Index (PFI) was computed. The vegetable farmers implement different extent of problems faced by them against different problems. A Problems Faced Index (PFI) was computed by using the formula:

$$PFI = PH\times3 + PM\times2 + PL\times1 + PNA\times0$$

Where,

PH = High extent of problems

PM = Medium extent of problems

PL = Low extent of problems

PNA = Not at All of problems

Problems Faced Index (PFI) for each problems strategy could range from 0 to 321, where 0 indicating lowest extent and 321 indicating highest extent of problems. Rank order was prepared for problem faced in floating vegetable cultivation.

3.6 Hypothesis of the study

According to Kerlinger (1973) a hypothesis is a conjectural statement of the relation between two or more variables. Hypothesis are always in declarative sentence form and they are related, either generally or specifically from variables to variables. In broad sense hypotheses are divided into two categories: (a) Research hypothesis and (b) Null hypothesis.

3.6.1 Research hypothesis

Based on review of literature and development of conceptual framework, the following research hypothesis was formulated:

"Each of the 11 selected characteristics (age, education, family size, area under floating vegetable cultivation, on farm income, off farm income, experience in floating vegetable cultivation, training exposure, time spend in floating vegetable cultivation, media exposure and knowledge on floating vegetable cultivation)of the farmers has significant contribution to their problems in floating vegetable production."

However, when a researcher tries to perform statistical tests, then it becomes necessary to formulate null hypothesis.

3.6.2 Null hypothesis

A null hypothesis states that there is no contribution between the concerned variables. The following null hypothesis was formulated to explore the contribution of the selected characteristics to their problems in floating vegetable production. Hence, in order to conduct tests, the earlier research hypothesis was converted into null form as follows:

"There is no contribution of the selected characteristics (age, education, family size, area under floating vegetable cultivation, on farm income, off farm income, experience in floating vegetable cultivation, training exposure, time spend in floating vegetable cultivation, media exposure and knowledge on floating vegetable cultivation) of farmers to their problems in floating vegetable production."

3.7 Data processing and analysis methods

Bogdan and Biklen (2006) insist that data analysis is an on-going part of data collection. Initially, all collected data were carefully entered in Access, exported to Microsoft Excel. Exported data were checked randomly against original completed interview schedule. Errors were detected and necessary corrections were made accordingly after exporting. Further consultation with research assistants and in some cases with the community people were required. Finally, data were exported from the program Microsoft Excel to SPSS/windows version 22.0, which offered statistical tools applied to social sciences. Qualitative data were converted into quantitative numbers, if required, after processing, scaling and indexing of the necessary and relevant variables to perform subsequent statistical analysis for drawing inferences.

As outlined earlier, there are many different forms and methods that can be used to analyze both quantitative and qualitative data in accordance with the objectives of the study. Both descriptive and analytical methods were employed in order to analyze the data. Descriptive techniques have been used to illustrate current situations, describe different variables separately and construct tables and graphs presented in results. These included: frequency distribution, percentage, range, mean, median, standard deviation and coefficient of variance.

In most cases the opinions of respondents were grouped in broader categories. Analytical techniques have been utilized to investigate the contribution of the selected

characteristics of the farmers to their problems in vegetable production. Statistical test like regression was used in this study. Each statistical technique is used under specific conditions and depends on the measurement scale of different variables.

3.8 Statistical analysis

Regression analysis was used to identify the linear combination between independent variables used collectively to predict the dependent variables (Miles and Shevlin, 2001). Regression analysis helps us understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed. Ordinary Least Squares (OLS) is used most extensively for estimation of regression functions. In short, the method chooses a regression where the sum of residuals, ΣUi is as small as possible (Gujarati, 1995). The factors that contribute to the problems faced by the farmers in floating vegetable production are analyzed using a regression model. The overall quality of fit of the model has been tested by ANOVA specifically F and R^2 test.

The data were analyzed in accordance with the objectives of the proposed research work. The factors that contribute to the problems faced by the farmers in floating vegetable production are analyzed using a regression model, multiple regression analysis (B) was used. Throughout the study, five (0.05) percent and one (0.01) percent level of significance were used as the basis for rejecting any null hypothesis. If the computed value of (B) was equal to or greater than the designated level of significance (*p*), the null hypothesis was rejected and it was concluded that there was a significant contribution between the concerned variable. Whenever the computed value of (B) was found to be smaller at the designated level of significance (*p*), the null hypothesis could not be rejected. It was concluded that there was no contribution of the concerned variables.

The model used for this analysis can be explained as follows:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + b_{10}x_{10} + b_{11}x_{11} + e$$

Where,

Y= is the problems faced by the farmers in floating vegetable production;

Of the independent variables, x_1 is the age of farmer, x_2 is education, x_3 is family size, x_4 is area under floating vegetable cultivation, x_5 is on farm income, x_6 is off farm income, x_7 is experience in floating vegetable cultivation, x_8 is training exposure, x_9 is time spend in floating vegetable cultivation in life, x_{10} is media exposure and x_{11} is knowledge on floating vegetable cultivation. On the other hand, b_1, b_2, b_3, b_4, b_5, b_6, b_7, b_8, b_9, b_{10}, and b_{11} are regression coefficients of the corresponding independent variables, and e is random error, which is normally and independently distributed with zero mean and constant variance.

CHAPTER IV

RESULTS AND DISCUSSION

The recorded observations in accordance with the objective of the study were presented and probable discussion was made of the findings with probable justifiable and relevant interpretation under this chapter. The findings of the study and their interpretation have been presented in this chapter. These are presented in three sections according to the objective of the study. The first section deals with the selected characteristics of the floating vegetable cultivators, while the second section deals with the constraints faced by the farmers in floating vegetable production. The third section deals with contribution of the farmers' selected characteristics to their constraints in vegetable production.

4.1 Characteristics of the farmers

Behavior of an individual is determined to a large extent by one's personal characteristics. There were various characteristics of the farmers that might have consequence to food security. But in this study, eleven characteristics of them were selected as independent variables, which included their age, education, family size, area under floating vegetable cultivation, on farm income, off farm income, experience in floating vegetable cultivation, training exposure, time spend in floating vegetable cultivation, media exposure and knowledge on floating vegetable cultivation that might be greatly influenced the constraints faced by the farmers in floating vegetable production are presented below-

4.1.1 Age

The age of the farmers has been varied from 23 to 65 years with a mean and standard deviation of 40.29 and 10.08, respectively. Considering the recorded age farmers were classified into three categories namely 'young', 'middle' and 'old' aged following MoYS (2012). The distribution of the farmers in accordance of their age is presented in Table 4.1.

Table 4.1 Distribution of the farmers according to their age

Category	Range (years)		Farmers		Mean	SD
	Score	Observed	Number	Percent		
Young aged	≤ 35	23-65	43	40.2	40.29	10.08
Middle aged	36-50		44	41.1		
Old aged	> 50		20	18.7		
Total			107	100.0		

Table 4.1 reveals that the middle-aged farmers comprised the highest proportion (41.1 percent) followed by young aged category (40.2 percent) and the lowest proportion were made by the old aged category (18.7 percent). Data also indicates that the middle and young aged category constitute (41.1 percent) of total farmers. The young and middle aged farmers were generally more involved in farm activities than the older that might be due to the energetic, enthusiastic nature of young and middle aged farmers.

4.1.2 Education

The level of educational scores of the farmers ranged from 0 to 16 with a mean and standard deviation of 5.88 and 4.01, respectively. Based on the educational scores, the farmers were classified into five categories. The distributions of farmers according to their level of education are presented in Table 4.2.

Table 4.2 Distribution of the farmers according to their level of education

Category	Range (years)		Farmers		Mean	SD
	Score	Observed	Number	Percent		
Can't read and sign	0	0-16	6	5.6	5.88	4.01
Can sign only	0.5		20	18.7		
Primary education	1-5		25	23.4		
Secondary education	6-10		49	45.8		
Above secondary	>10		7	6.5		
Total			107	100.0		

Table 4.2 shows that farmers under secondary education category constitute the highest proportion (45.8 percent) followed by primary education (23.4 percent). On the other hand, the lowest 5.6 percent in can't read and sign category followed by

above secondary category (6.5 percent) and 18.7 percent respondents were can sign only category. Education broadens the horizon of outlook of farmers and expands their capability to analyze any situation related to confrontations against constraints in vegetable production. To adjust with same, they would be progressive minded to confront against constraints in vegetable production and involve with modern cultural, processing and marketing facilities in vegetable production.

4.1.3 Family size

Family size of the farmers ranged from 3 to 8 with the mean and standard deviation of 4.92 and 1.32, respectively. According to family size the farmers were classified into three categories (Mean ± Standard Deviation) viz. 'small', 'medium' and 'large' family. The distribution of the cultivators according to their family size is presented in Table 4.3.

Table 4.3 Distribution of the farmers according to their family size

Category	Range (Number)		Farmers		Mean	SD
	Score	Observed	Number	Percent		
Small family	≤ 3	3-8	19	17.8	4.92	1.32
Medium family	4-6		75	70.1		
Large family	> 6		13	12.1		
Total			107	100.0		

Table 4.3 indicate that the medium size family constitute the highest proportion (70.1 percent) followed by the small size family (17.8 percent). Only 12.1 percent farmers had large family size. Such finding is quite normal as per the situation of Bangladesh. The trend of nuclear family has been rising in the study area and subsequently the family member becoming smaller than the extended family.

4.1.4 Area under floating vegetable cultivation

The area under floating vegetable cultivation of the farmers ranged from 16 decimals to 65 decimals with a mean and standard deviation of 39.96 and 6.35, respectively. Based on their area under floating vegetable cultivation, the vegetable cultivators were classified into three categories (Mean ± Standard Deviation) namely 'low', 'medium' and 'high' area under floating vegetable cultivation. The distribution of the farmers according to their area under floating vegetable cultivation is presented in Table 4.4.

Table 4.4 Distribution of the farmers according to their area under floating vegetable cultivation

Category	Range (ha)		Farmers		Mean	SD
	Score (ha)	Observed	Number	Percent		
Small area	≤ 44	16-65	7	6.5	39.96	6.35
Medium area	45-63		91	85.0		
Large area	>63		9	8.4		
Total			107	100.0		

Table 4.4 indicates that the medium farm holder constitutes the highest proportion (85.0 percent) followed by large farm holder (8.4 percent) and (6.5 percent) small area respectively. The findings of the study reveal that most of the farmers were medium to large sized area under floating vegetable cultivation. Due to the enhancing the economic status of the farmers at the study area, the farmers are likely to motivate to buy the land.

4.1.5 On farm income

The score of on farm income of the vegetable cultivators ranged from 30 to 120 thousand (BDT) with a mean and standard deviation of 65.95 and 12.93, respectively. On the basis of on farm income, the vegetable cultivators were classified into three categories (Mean ± Standard Deviation) namely 'low', 'medium' and 'high' on farm income. The distribution of the vegetable cultivators according to their on farm income is presented in Table 4.5.

Table 4.5 Distribution of the farmers according to their on farm income

Category	Range ('000' BDT)		Farmers		Mean	SD
	Score	Observed	Number	Percent		
Low income	≤ 52	30-120	8	7.5	65.95	12.93
Medium income	53-79		89	83.2		
High income	> 79		10	9.3		
Total			107	100.00		

Data reveals that the vegetable cultivators having medium on farm income constitute the highest proportion (83.2 percent), while the lowest proportion in low income (7.5 percent) followed by high income (9.3 percent). Overwhelming majority (92.5 percent) vegetable cultivators have medium to high level on farm income.

4.1.6 Off farm income

The score of off farm income of the vegetable cultivators ranged from 19 to 105 thousand (BDT) with a mean and standard deviation of 82.87 and 16.10, respectively. On the basis of off farm income, the vegetable cultivators were classified into three categories (Mean ± Standard Deviation) namely 'low', 'medium' and 'high' off farm income. The distribution of the vegetable cultivators according to their off farm income is presented in Table 4.6.

Table 4.6 Distribution of the farmers according to their off farm income

Category	Range ('000' BDT)		Farmers		Mean	SD
	Score	Observed	Number	Percent		
Low income	≤ 35	19-105	9	8.4	62.87	16.10
Medium income	36-70		86	80.4		
High income	> 70		12	11.2		
Total			107	100.00		

Data reveals that the vegetable cultivators having medium off farm income constituted the highest proportion (80.4 percent), while the lowest proportion in low income (8.4 percent) followed by high off farm income (11.2 percent). Overwhelming majority (91.6 percent) vegetable cultivators have medium to high level off farm income.

4.1.7 Experience in floating vegetable cultivation

Score of experience in floating vegetable cultivation of vegetable cultivators could range from 5 to 27 with mean and standard deviation of 14.11 and 5.63, respectively. On the basis of experience scores, the vegetable cultivators were classified into three categories (Mean ± Standard Deviation) namely 'low, 'medium' and 'high' experience in floating vegetable cultivation. The distribution of the vegetable cultivators according to their experience in floating vegetable cultivation is given in Table 4.7.

Table 4.7 Distribution of the farmers according to their experience in floating vegetable cultivation

Category	Range (year)		Farmers		Mean	SD
	Score	Observed	Number	Percent		
Low experience	≤8	5-27	24	22.4	14.11	5.63
Medium experience	9-20		69	64.5		
High experience	>20		14	13.1		
Total			107	100.0		

Table 4.7 reveals that the majority (64.5 percent) of the vegetable cultivator fell in medium experience in floating vegetable cultivation category, whereas only 22.4 percent in low experience category followed by 13.1 percent in high experience in floating vegetable cultivation category. The findings of the present study reveal that around 86.9 percent of the vegetable cultivators in the study area had low to medium experience in floating vegetable cultivation.

4.1.8 Training exposure

Training exposure score of the vegetable farmers ranged from 0 to 8 with a mean and standard deviation of 3.30 and 2.35, respectively. Based on the training exposure score, the vegetable farmers were classified into four categories namely ‘no training’, ‘low’, ‘medium’ and ‘high’ training exposure. The distribution of the vegetable farmers according to their training exposure is presented in Table 4.8.

Table 4.8 Distribution of the farmers according to their training exposure

Category	Range (score)		Vegetable farmers		Mean	SD
	Score	Observed	Number	Percent		
No training	0	0-8	23	21.5	3.30	2.35
Low training	1		4	3.7		
Medium training	2-5		68	63.6		
High training	> 5		12	11.2		
Total			107	100.0		

Table 4.8 indicates that the highest proportion (63.6 percent) of the vegetable farmers had medium training exposure compared to 21.5 percent in no training exposure and

11.2 percent in high training exposure category, respectively and the vegetable farmers (3.7 percent) had low training. Training makes the vegetable farmers skilled and helps them to acquire deep knowledge about the respected aspects. Trained vegetable farmers can face any kind of challenges about the adverse situation in their vegetable cultivation. So, they show favorable behavior toward positive attitude towards floating vegetable cultivation. This result might have due to the positive attitude towards floating vegetable cultivation.

4.1.9 Time spent in floating vegetable cultivation

Time spent in floating vegetable cultivation growers ranged from 33 to 54 with a mean and standard deviation of 45.00 and 6.13, respectively. Based on the time spent in vegetable farming score, the vegetable growers were classified into three categories (Mean ± Standard Deviation) namely minimum, average and maximum time spent in floating vegetable cultivation. The distribution of the vegetable growers according to their time spent in floating vegetable cultivation is presented in Table 4.9.

Table 4.9 Distribution of the vegetable growers according to their time spent in vegetable farming

Category	Range (hr/week)		Vegetable growers		Mean	SD
	Score	Observed	Number	Percent		
Minimum time spent	≤ 39	33-54	17	15.9	45.00	6.13
Average time spent	40-51		69	64.5		
Maximum time spent	> 51		21	19.6		
Total			107	100.0		

Table 4.9 indicates that the highest proportion (64.5 percent) of the floating vegetable growers had average time spent compared to 15.9 percent in minimum time spent and 19.6 percent vegetable growers in maximum time spent category, respectively. This result might have due to the positive attitude towards floating vegetable cultivation and floating vegetable cultivation climatic condition.

4.1.10 Media exposure

The observed score of media exposure of the farmers ranged from 18 to 31 against a possible range of 0 to 36. The average score of the farmers' media exposure was 24.68 with a standard deviation 3.55 (Table 4.8). The farmers were classified into three categories on the basis of their exposure to vegetable farming information through communication exposure scores and distribution of the three categories (Mean ± Standard Deviation) namely 'low', 'medium' and 'high' media exposure of the farmers.

Table 4.10 Distribution of the farmers according to their media exposure

Category	Range		Farmers		Mean	SD
	Score	Observed	Number	Percent		
Low exposure	≤21	18-31	26	24.3	24.68	3.55
Medium exposure	22-28		63	58.9		
High exposure	>28		18	16.8		
Total			107	100.0		

Data shows that the highest proportion (58.9 percent) of the farmers had medium media exposure and lowest media exposure was 16.8 percent of them having high media exposure and 24.3 percent fell in low media exposure. From this table, it might be concluded that majority of the farmers had medium media exposure. It could be concluded that different media of the study area were available to the farmers. The finding was interesting but logical because in general the farmers in the rural areas of Bangladesh are less cosmopolite in nature and less exposed to different information sources. Finding revealed that 24.3 percent of the farmers had low media exposure which demands for strengthening and improving the communication strategy. Low media exposure might be the reason that some respondent may think that they have enough knowledge about vegetable cultivation. Media exposure pertains to ones contact with multifarious sources of farming knowledge and information about floating vegetable cultivation. This results in cognitive change of the users with an eventual change in behavior and also in skill. They receive information from their neighbors, relatives and workmates etc. at the study area.

4.1.11 Knowledge on floating vegetable cultivation

Knowledge on floating vegetable cultivation scores of the vegetable farmers ranged from 11 to 18 against possible score of 0 to 20. The average score and standard deviation were 14.95 and 2.03, respectively. Based on the knowledge on floating vegetable cultivation scores, the vegetable farmers were classified into three categories (Mean ± Standard Deviation) namely low, medium and high knowledge on floating vegetable cultivation.

Table 4.11 Distribution of the farmers according to their knowledge on floating vegetable cultivation

Category	Range		Vegetable farmers		Mean	SD
	Score	Observed	Number	Percent		
Low knowledge	≤ 13	11-18	25	23.4	14.95	2.03
Medium knowledge	14-16		78	72.9		
High knowledge	≥ 17		4	3.7		
Total			107	100.0		

Data presented in the table 4.11 revealed that 72.9 percent of the vegetable farmers had medium knowledge on floating vegetable cultivation, 23.4 percent had low knowledge and 3.7 percent had high knowledge on floating vegetable cultivation. Thus, an overwhelming majority (72.9 percent) of the vegetable farmers had medium knowledge on floating vegetable cultivation. This lead to understanding that knowledge on floating vegetable cultivation would reflected more by the medium knowledge on vegetable production farmers' group in the present study. Knowledge on floating vegetable cultivation is definitely affected by the education of the vegetable farmers because education helps to enhance the eagerness to be acquainted with new variety or technology. In addition, Knowledge on floating vegetable cultivation of the farmer is definitely affected by the media exposure because with the increase of the communication exposure new thing can be taught. Knowledge on floating vegetable cultivation is very important aspects for creating positive attitude towards floating vegetable cultivation. Hence, floating vegetable farmers must require skill and modern knowledge to bring more yield and profit to ensure creating favorable attitude towards floating vegetable cultivation. This might be logical because the education facilities at the study area were more available as well as the training provided by the different GO and NGO were also satisfactory.

4.2 Problem faced in floating vegetable cultivation

Problem faced in floating vegetable cultivation by the farmers in vegetable production scores ranged from 28 to 43 against possible score of 0 to 48. The average score and standard deviation were 36.11 and 4.65, respectively. Based on the problem faced in floating vegetable cultivation scores, the respondents were classified into three categories (Mean ± Standard Deviation) namely low, medium and high problem faced in floating vegetable cultivation (Table 4.12).

Table 4.12 Distribution of the farmers according to their problems faced in floating vegetable cultivation

Category	Range		Respondents		Mean	SD
	Score	Observed	Number	Percent		
Low problems	≤ 31	28-43	24	22.4	36.11	4.65
Medium problems	32-40		58	54.2		
High problems	≥ 40		25	23.4		
Total			107	100.0		

Data presented in the table 4.12 revealed that 54.2 percent of the respondent had medium problem faced in floating vegetable cultivation, 22.4 percent had low problems and 23.4 percent had high problem faced in floating vegetable cultivation. Thus, about threefourths (77.6 percent) of the respondents had medium to high category problem faced in floating vegetable cultivation at the study area.

4.2.1 Rank order of problem faced in floating vegetable cultivation

Rank order of the sixteen strategies of problem faced in floating vegetable cultivation in vegetable production is presented in the following Table 4.13. As per Problems Faced Index (PFI), initial cost is high positioned the 1st and low demand in the local market in last position.

The problems faced by the farmers in floating vegetable cultivation according to descending order through the analysis of the received data from respondents are initial cost is high, lack of skilled labor, marketing, bound of the farmers to supply commodities to middle man in low price, shortage of organic manure for cultivation, insect attack, pest attack, unavailability of seedlings in time, lack of quality seedlings,

lack of knowledge on balanced fertilizer for vegetable cultivation, lack of capital, lack of training opportunity, in adequate credit supply of vegetable cultivation, lack of contact with extension staff, lack of coordination from extension stuff and low demand in the local market respectively.

The result showed that the highest problem faced by the farmers in floating vegetable cultivation is initial cost is high. This might be caused because the vegetable bed preparation and materials were costly found in the study area.

Table 4.13 Rank order of problems faced by the farmers in floating vegetable cultivation

Sl. No.	Nature of Problems	PFI score	Rank
1.	Initial cost is high	298	1st
2.	Lack of skilled labor	292	2nd
3.	Marketing	288	3rd
4.	Bound of the farmers to supply commodities to middle man in low price	285	4th
5.	Shortage of organic manure for cultivation	282	5th
6.	Insect attack	278	6th
7.	Pest attack	275	7th
8.	Unavailability of seedlings in time	271	8th
9.	Lack of quality seedlings	268	9th
10.	Lack of knowledge on balanced fertilizer for vegetable cultivation	265	10th
11.	Lack of capital	260	11th
12.	Lack of training opportunity	246	12th
13.	In adequate credit supply of vegetable cultivation	232	13th
14.	Lack of contact with extension staff	218	14th
15.	Lack of coordination from extension stuff	205	15th
16.	Low demand in the local market	175	16th

The lowest cause in vegetable cultivation at the study area was low demand in the local market. This might be happened because the product had market value and more demanded items at the study area during the cultivation time.

4.3 Factors related to the problems faced in floating vegetable cultivation

In order to estimate the problems faced by the farmers in floating vegetable cultivation from the independent variables, multiple regression analysis was used which is shown in the Table 4.14.

Table 4.14 Multiple regression coefficients of contributing factors related to the problems faced in floating vegetable cultivation

Dependent variable	**Independent variables**	**B**	***p***	**R^2**	**Adj. R^2**	**F**	***p***
Problems faced in floating vegetable cultivation	Age	-.043	0.379	0.687	0.651	18.94	0.000**
	Education	-.194	0.035*				
	Family size	-.146	0.576				
	Area under floating vegetable cultivation	-.286	0.017*				
	On farm income	-.090	0.250				
	Off farm income	-.127	0.124				
	Experience in floating vegetable cultivation	-.092	0.049*				
	Training exposure	-.031	0.804				
	Time spent in floating vegetable cultivation	-.051	0.011*				
	Media exposure	-.750	0.000**				
	Knowledge on floating vegetable cultivation	-.192	0.003**				

** Significant at $p < 0.01$;

* Significant at $p < 0.05$

Table 4.14 shows that there is a significant contribution of respondents' education, area under floating vegetable cultivation, experience in floating vegetable cultivation, time spend in floating vegetable cultivation, media exposure and knowledge on floating vegetable cultivation. Of these, media exposure and knowledge on floating vegetable cultivation were the most important contributing factors (significant at the

1% level of significance) and education, area under floating vegetable cultivation, experience in floating vegetable cultivation, time spend in floating vegetable cultivation (significant at the 5% level of significance) while coefficients of other selected variables don't have any contribution on problems faced by the farmers in floating vegetable production.

The value of R^2 is a measure of how of the variability in the dependent variable is accounted for by the independent variables. So, the value R^2 0.687 means that independent variables accounts for 68% of the variation in problems faced by the farmers in floating vegetable cultivation.

The F ratio is 18.94 which is highly significance ($p<.001$). This ratio indicates that the regression model significantly improved the ability to predict the outcome variable.

4.3.1 Significant contribution of education to the problems faced by the farmers in floating vegetable cultivation

The contribution of education to the problems faced by the farmers in floating vegetable cultivation was measured by testing the following null hypothesis;

"There is no contribution of education to the problems faced by the farmers in floating vegetable cultivation".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of the education was at 5% significance level (p=0.035).
b. So, the null hypothesis could be rejected.
c. The b-value of level of education is (-0.035). So, it can be stated that as education increase by one unit, problems faced by the farmers in floating vegetable cultivation decreases by 0.035 units. Considering the effects of all other predictors are held constant.

Based on the above finding, it can be said that a floating vegetable cultivators had more education decreased the problems faced by the farmers in floating vegetable cultivation. So, education has significantly contributed to the problems faced by the farmers in floating vegetable cultivation.

4.3.2 Significant contribution of area under floating vegetable cultivation to the problems faced by farmers in floating vegetable cultivation

The contribution of area under floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation was measured by testing the following null hypothesis;

"There is no contribution of area under floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of the area under floating vegetable cultivation was at 5% significance level (p=0.017).

b. So, the null hypothesis could be rejected.

c. The b-value of level of area under floating vegetable cultivation is (-0.286). So, it can be stated that as area under floating vegetable cultivation increase by one unit, problems faced by the farmers in floating vegetable cultivation decreases by 0.286 units. Considering effects of all other predictors are held constant.

Based on the above finding, it can be said that a floating vegetable cultivators had more area under floating vegetable cultivation decreased the problems faced by the farmers in floating vegetable cultivation. So, area under floating vegetable cultivation has significantly contributed to the problems faced by the farmers in floating vegetable cultivation.

4.3.3 Significant contribution of experience in floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation

The contribution of experience in floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation was measured by testing the following null hypothesis;

"There is no contribution of experience in floating vegetable cultivation n to the problems faced by the farmers in floating vegetable cultivation".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of the experience in floating vegetable cultivation was at 5% significance level (p=0.049).

b. So, the null hypothesis could be rejected.

c. The b-value of level of experience in floating vegetable cultivation is (-0.092). So, it can be stated that as experience in floating vegetable cultivation increase by one unit, problems faced by the farmers in floating vegetable cultivation decreases by 0.092 units. Considering the effects of all other predictors are held constant.

Based on the above finding, it can be said that a floating vegetable cultivators had more experience in floating vegetable cultivation decreased the problems faced by the farmers in floating vegetable cultivation. So, experience in floating vegetable cultivation has significantly contributed to the problems faced by the farmers in floating vegetable cultivation.

4.3.4 Significant contribution of time spent in floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation

The contribution of time spent in floating vegetable cultivation n to the problems faced by the farmers in floating vegetable cultivation was measured by testing the following null hypothesis;

"There is no contribution of time spent in floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of the time spent in floating vegetable cultivation was at 5% significance level (p=0.011).

b. So, the null hypothesis could be rejected.

c. The b-value of level of time spent in floating vegetable cultivation is (-0.051). So, it can be stated that as time spent in floating vegetable cultivation increase

by one unit, problems faced by the farmers in floating vegetable cultivation decreases by 0.051 units. Considering effects of all other predictors are held constant.

Based on the above finding, it can be said that a floating vegetable cultivators had more time spent in floating vegetable cultivation decreased the problems faced by the farmers in floating vegetable cultivation. So, time spend in floating vegetable cultivation has significantly contributed to the problems faced by the farmers in floating vegetable cultivation.

4.3.5 Significant contribution of media exposure to the problems faced by the farmers in floating vegetable cultivation

The contribution of media exposure to the problems faced by the farmers in floating vegetable cultivation was measured by testing the following null hypothesis;

"There is no contribution of media exposure to the problems faced by the farmers in floating vegetable cultivation".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of the media exposure was at 1% significance level (p=0.000).
b. So, the null hypothesis could be rejected.
c. The b-value of level of media exposure is (-0.750). So, it can be stated that as media exposure increase by one unit, problems faced by the farmers in floating vegetable cultivation decreases by 0.750 units. Considering the effects of all other predictors are held constant.

Based on the above finding, it can be said that a floating vegetable cultivators had more media exposure decreased the problems faced by the farmers in floating vegetable cultivation. So, media exposure has high significantly contributed to the problems faced by the farmers in floating vegetable cultivation.

4.3.6 Significant contribution of knowledge on floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation

The contribution of knowledge on floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation was measured by testing the following null hypothesis;

"There is no contribution of knowledge on floating vegetable cultivation to the problems faced by the farmers in floating vegetable cultivation".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of the knowledge on floating vegetable cultivation was at 1% significance level (p=0.003).

b. So, the null hypothesis could be rejected.

c. The b-value of level of knowledge on floating vegetable cultivation is (-0.192). So, it can be stated that as knowledge on floating vegetable cultivation increase by one unit, problems faced by the farmers in floating vegetable cultivation decreases by 0.192 units. media exposure effects of all other predictors are held constant.

Based on the above finding, it can be said that a floating vegetable cultivators had more knowledge on floating vegetable cultivation decreased the problems faced by the farmers in floating vegetable cultivation. So, knowledge on floating vegetable cultivation has significantly contributed to the problems faced by the farmers in floating vegetable cultivation.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The study was conducted in the Dirgha and Kolardoyania union of Nazirpur upazila under Pirojpur district to find out the constraints faced by the farmers in vegetable production. Total 368 vegetable cultivators were selected from the study area as the population and according to Yamane's formula, the respondents comprised of 107 floating vegetable cultivators constituted the sample of the study. A well-structured interview schedule was developed based on objectives of the study for collecting information. The independent variables were: age, education, family size, area under floating vegetable cultivation, on farm income, off farm income, experience in floating vegetable cultivation, training exposure, time spend in floating vegetable cultivation, media exposure and knowledge on floating vegetable cultivation. Data collection was started in 24 March, 2017 and completed in 25 April, 2017. Various statistical measures such as frequency counts, percentage distribution, average, and standard deviation were used in describing data. In order to estimate the contribution of the selected characteristics of vegetable cultivators to their constraints faced by the farmers in vegetable production, multiple regression analysis (B) was used. The major findings of the study are summarized below:

5.1 Major Findings

5.1.1 Selected characteristics of the floating vegetable cultivators

Age: The middle-aged vegetable cultivators comprised the highest proportion (41.1 percent) and lowest proportion by the old aged category (18.7 percent).

Education: Secondary education constituted the highest proportion (45.8 percent) and the lowest 5.6 percent in can't read and sign category.

Family size: The medium family size constituted the highest proportion (70.1 percent), whereas the lowest 12.1 percent in large family size category.

Area under floating vegetable cultivation: The medium farm holder constitutes the highest proportion (85.0 percent) followed by small area under floating vegetable cultivation (6.5 percent).

On farm income: The vegetable cultivators having medium on farm income constitute the highest proportion (83.2 percent), while the lowest proportion in low income (7.5 percent) followed by high income (9.3 percent).

Off farm income: The vegetable cultivators having medium off farm income constitute the highest proportion (80.4 percent), while the lowest proportion in low income (8.4 percent).

Experience in floating vegetable cultivation: The majority (64.5 percent) of vegetable cultivator fell in medium experience in floating vegetable cultivation category, whereas only 22.4 percent in low experience category.

Training exposure: The highest proportion (63.6 percent) of the vegetable farmers had medium training exposure and the lowest (3.7 percent) vegetable farmers had low training.

Time spent in floating vegetable cultivation: The highest proportion (64.5 percent) of the floating vegetable growers had average time spent compared to 15.9 percent in minimum time spent.

Media exposure: The highest proportion (58.9 percent) of the farmers had medium media exposure and lowest media exposure was 16.8 percent of them having high media exposure.

Knowledge on floating vegetable cultivation: The majority 72.9 percent of the vegetable farmers had medium knowledge on floating vegetable cultivation, 23.4 percent had low knowledge and 3.7 percent had high knowledge on floating vegetable cultivation.

5.1.2 Problem faced in floating vegetable cultivation

The highest 54.2 percent of the respondent had medium problem faced in floating vegetable cultivation, 22.4 percent had low problems and 23.4 percent had high problem faced in floating vegetable cultivation.

5.1.2.1 Rank order of problem faced in floating vegetable cultivation

As per Problems Faced Index (CFI), initial cost is high positioned the 1st and low demand in the local market in last position.

5.1.3 Factors related to the problems faced by the farmers in floating vegetable production

There is a significant contribution of respondents' education, area under floating vegetable cultivation, experience in floating vegetable cultivation, time spend in floating vegetable cultivation, media exposure and knowledge on floating vegetable cultivation. The 68.7% (R^2 = 0.687) of the variation in the respondents changed problem faced in floating vegetable cultivation was attributed to the significant independent.

5.2 Conclusions

Conclusion is the final decision or judgment, which is placed through contention at the end or termination of a research work. Conclusion should be so constructive that its words and contentions must drew the attention of the concerned individuals/organizations. The findings and relevant facts of research work prompted the researcher to draw following conclusions.

i. The findings revealed that an overwhelming majority (77.6 percent) of the respondents had medium to high category problem faced in floating vegetable cultivation at the study area. It may be said that the composite problem faced in floating vegetable cultivation needs to minimize to sustainable vegetable production.

ii. Education of the farmers showed the important contributing factor to the problem faced in floating vegetable cultivation. This means that high literacy and educational level among the farmers might have influenced to reduce the problem faced in floating vegetable cultivation.

iii. Area under floating vegetable cultivation of the farmers showed the important contributing factor to the problem faced in floating vegetable cultivation. This means that area under floating vegetable cultivation might have influenced in problem faced in floating vegetable cultivation.

iv. Maximum (64.5%) vegetable cultivators had medium experience in floating vegetable cultivation category and regression analysis revealed that experience in floating vegetable cultivation was a contributing factor to the problem faced in floating vegetable cultivation. Therefore, it may be concluded that high experience in floating vegetable cultivation encourages the farmers to practice more plant protection management in vegetable cultivation against problems faced by them.

v. Maximum (64.5 %) vegetable cultivators had average time spent in floating vegetable cultivation category and regression analysis revealed that time spent in floating vegetable cultivation was a contributing factor to the problems faced by the farmers in floating vegetable cultivation. Therefore, it may be concluded that time spent in floating vegetable cultivation of the farmers had influenced to reduce the problems faced by the farmers in floating vegetable cultivation.

vi. Maximum (58.9 %) vegetable cultivators had medium media exposure on vegetable cultivation category and regression analysis revealed that media exposure of the vegetable cultivators was a contributing factor to the problems faced by the farmers in floating vegetable cultivation. Therefore, it may be said that the higher the media exposure of the farmers the lower of the problems faced by the farmers in floating vegetable cultivation.

vii. Knowledge on floating vegetable production technologies of the farmers had a significant contribution to the problems faced by the farmers in floating vegetable cultivation. Consequently, they became motivated practice plant protection management in vegetable cultivation. The above facts lead to the conclude that necessary arrangements should be made increase the knowledge of farmers which would ultimately to reduce the problems faced by the farmers in floating vegetable cultivation

5.3 Recommendations

5.3.1 Recommendations for policy implications

On the basis of observation and conclusions drawn from the findings of the study following recommendations are made:

i. An increased rate and extent of problems faced by the farmers in floating vegetable cultivation are vitally important for reducing the yield of vegetable production. It is revealed from the problems faced by the farmers in floating vegetable cultivation that 54.2 percent of the respondent had medium problems faced by the respondents in floating vegetable cultivation. This rate and extent of problems faced by the respondents in floating vegetable cultivation should be reduced at all along. It is, therefore, recommended that an effective step should be taken by the Department of Agricultural Extension (DAE) and Non-Government Organizations (NGOs) for strengthening the respondents' qualities in favor of reduce the problems faced by the farmers in floating vegetable cultivation to a higher degree.

ii. Education of the respondents had a significant contribution to the problems faced by the farmers in floating vegetable cultivation. It indicates the importance of education for reducing the problems faced by the respondents in floating vegetable cultivation. It may be recommended that arrangements should be made for enhancing the education level of the vegetable cultivators by the concerned authorities through the establishment of night school, adult education and other extension methods as possible.

iii. Area under floating vegetable cultivation had a significant contribution to the problems faced by the farmers in floating vegetable cultivation. It may be recommended that arrangements should be made for enhancing the awareness of the vegetable cultivators by the concerned authorities in case of large scale vegetable production.

iv. Experience in floating vegetable cultivation was important contributing factors to the problems faced by the farmers in floating vegetable cultivation. Therefore, it is recommended that the extension workers should work with experienced farmers in floating vegetable cultivation which would help be helpful to minimize the problems faced by the farmers in floating vegetable cultivation.

v. The concerned authorities should take necessary steps to motivate farmers with a view to promoting the time spent in floating vegetable cultivation to a higher

degree which would help be helpful to minimize the problems faced by the farmers in floating vegetable cultivation.

vi. The concerned authorities should take necessary steps to increase the media exposure of the farmers. Therefore, it is recommended that the extension worker should provide supplementary supports to motivate farmers for increasing the media exposure.

vii. Maximum (72.9 %) farmers having medium knowledge on floating vegetable production technologies. It should be selected on priority basis for any motivational training by Department of Agricultural Extension (DAE) and concern Non-Government Organizations (NGOs) for gaining sustainable floating vegetable production as well as to reduce the problems faced by the farmers in floating vegetable cultivation through increasing the knowledge on floating vegetable cultivation.

5.3.2 Recommendations for further study

On the basis of scope and limitations of the present study and observation made by the researcher, the following recommendations are made for future study.

i. The present study was conducted in Dirgha and Kolardoyania union of Nazipur upazila under Pirojpur district. It is recommended that similar studies should be conducted in other relevent areas of Bangladesh.

ii. This study investigated the contribution of eleven characteristics of the farmers with their problems faced by the farmers in floating vegetable cultivation as dependent variables. Therefore, it is recommended that further study should be conducted with other characteristics of the farmers with their problems faced by the farmers in floating vegetable cultivation.

iii. The study was based on the farmers' problems faced by the farmers in floating vegetable cultivation. Further studies may be conducted in respect of problems faced by the farmers of other crop production.

REFERENCE

Ahmed, F. 1985. Effect of Spacing on Growth, bulb and flower production of Tuberose *(Polianthes tuberosa* L.). *M.Sc. (Ag.) thesis*, Dept, of Hort., Bangladesh Agricultural University, Mymensingh.3p.

Ahmed, S. 2002. Problem Confrontation of the Contact Growers of BADC in Jute Seed Production-MS *(Ag. Ext. Ed) Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh.

Ahsan, N. 1964. Production and Marketing of Potato Cimilla Thana. Research and Survey Bulletin No. 5, Comilla. Bangladesh Academy for Rural Development.

Akanda, M. G. R. 1993. Problem Confrontation of the Farmers in respect of Cultivating Mukta (BRI 1) Rice. MS. Thesis, Department of Agricultural Extension and Teachers' Training, , BAU, Mymensingh.

Akther, G.M. 1973. "Marketing of Potato in some selected areas of Comilla Kotwali Thana". Anunpublished M.Sc. (Agril. Econ.). Thesis, submitted to the Faculty of Agricultural Economics and Rural Sociology, Mymensingh. Department of cooperation and marketing, , BAU, Mymensingh.

Alam, A. F. 1981. Pattern and consraints potato marketing in Dhaka (Bangladesh) city in DhakaUniversity studies (Bangladesh) part C, (June 1981), 2 (1) : 19-29.

Ali, M. Y. 2014. Problem Confrontation in Betel Leaf Cultivation by the Farmers of Natore District. MS (Agril. Ext.) Thesis, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka.

Ali, M. A. 1978. Cattle Problems of the Farmers in Tarakanda Union of FulpurThana under Mymensingh District. M.Sc. Thesis, Department of Agricultural Extension Education, , BAU, Mymensingh.

Aziz, M. A. 2006. Constraints Faced by the Farmers in Potato Cultivation in Jhikargacha Upazilla Under Jessore District. *M.S. (Ag. Ext. Ed.) Thesis*, Department of Agricultural Extension and Information System, SAU, Dhaka.

Baten, S.M.A. (2014). Problems Faced by the Farmers in Cotton Cultivation. MS (Agril. Ext.) Thesis, Department of Agricultural Extension and Information System, SAU, Dhaka.

Bashar, M. A. 2006. Problem Confrontation of the Farmers in Mushroom Cultivation. M.S. Thesis,Department of Agricultural Extension and Information System, SAU, Dhaka.

BBS. 2016. The Yearbook of Agricultural Statistical of Bangladesh. Bangladesh Bureau of Statistics, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.

Bhuayan, M. A. S. 2002. Constraints Faced by the Farmers in Banana in Cultivation in Kuliarchar upazila under Kishoreganj District. *M.S. (Ag .Ext. Ed). Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh.

Bogdan, R. C. and Biklen, S. K. 2006. Qualitative Research for Education: An Introduction to Theory and Methods (5th ed.). Boston: Allyn & Bacon.

Casley, D.J. and Kumar, K. (1998). The Collection, Analysis and Use of Monitoring and Evaluation Data. Washington DC: World Bank/Johns Hopkins University Press.

Chander, S.; H. Nand and J. P. Sharma .1990. Knowledge, Adoption and Constraints Analysis of Potato Technology. Indian Journal of Extension Education. XXVI (1 & 2): 94-98.

Collins, N.W., Cannon, J.M. 1983. Sweet potato production and consraints in the United States.Ad. North Carolina State Univ., Releigh. North Carolina (U.S.A.). Dept of HorticulturalScience. Faculty of Agriculture. Proceedings of the Caribbean Regional Workshop onTropical Root Crops, Kingston, Jamica, 10-16 April 1983 (ind). P. 251-254.

Faroque, M. G. 1997. Participation of Female Rural Youth in Selected Homestead Activities in Two Selected Villages of Bhaluka Upazilla Under Mymansingh District. *M.S. (Ag. Ext. Ed.) Thesis*, Department of Agricultural Extension Education, BAU, Mymensingh.

Freeman, H. A. and S. A. Breth, 1994. Population pressure land use and the productivity of Agricultural systems in the West African Savanna, Issues in African Rural Development: 103-114.

Gujarati, D.N. (1995). Basic Econometrics, *McGraw-Hill International*.

Gumisiriza, G.W. Wagoire, B. Bungutski and D.G. Tanner 1994. *Wheat Production and Research in Uganda; Constraints and Sustainability. Developing sustainable wheat production systems.* The 8tn Regional Wheat Workshop for Easter, Central and Southern Africa, Kampala, Uganda 7 to 10 June 1993: 51-56.

Hague, M. K. 2001. Environmental Awareness and Problem Confrontation of the FFS Farmers in Practicing 1PM. MS. Thesis,Department of Agricultural Extension Education, , BAU, Mymensingh.

Halim, M. A. 2003. Constraints faced by the farmers in adopting crop Diversification. *M.S. (Ag. Ext. Ed.) Thesis*, Department of Agricultural Extension Education, , BAU, Mymensingh.

Haq, A. H. M. R, Ghosal, T. k. and Ghosh. 2004. Cultivation wetlands in Bangladesh,India, LEISA. Available from: http:/bit. Ly/C3 AhO0 [Accessed: 05/08/10]

Haque, M. A. 1995. Problem Confrontation of the Members of Mohila Bittaheen Samabaya Samittee working under the Bangladesh Rural Development Board. *M.S. (Ag. Ext. Ed.) Thesis*, Department of Agricultural Extension Education, ,BAU, Mymensingh.

Hossain, M. S. 2002. Resource Poor Farmers' Problem Confrontation in Using Manures Towards Integrated Plant Nutrient System (IPNS). MS. Thesis, Department of Agricultural Extension Education, BAU, Mymensingh.

Hossain, S. M. A. 1985. A Study of the Landless Labourers in Bhahabali Union of Mymensingh District. MS. Thesis, Department of Agricultural Extension and Teachers' Training, BAU, Mymensingh.

Huque, M. A. S. 2006. Problem Faced by the Farmers in Using Integrated Plant Nutrient Management. *M.S. (Ag. Ext. Ed.) Thesis*, Department of Agricultural Extension and Information System, SAU, Dhaka.

Irfanullah, H.M., A. Adrika, A. Ghani, and Z.A. Khan. (2007). "Introduction of Floating Gardening in the North-eastern wetlands of Bangladesh for Nutritional Security and Sustainable Livelihood." Renewable Agriculture and Food, Dhaka.

Irfanullah, H.M., M.A. Azad, M. Kamruzzaman, and M.A. Wahed,2011. Floating Gardening in Bangladesh: a means to rebuild lives after devasting flood. Indian Journal of Traditional Knowledge, Vol.10 (1), January 2011, pp. 31-38.

Ismail, S. M. 2001. Agricultrual Problem confrontation of the Farm Youth in a Selected Block of Haor Area of Mohanganj Upazila Under Netrokona Distrcit. *M.S. (Ag. Ext. Ed.) Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh.

Karim, M. A. 1974. Relationship of Selected Economics, Social and Psychological Characteristics of the Union Assistants of Mymensing Agricultural District with their Problem Confrontation. M. Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension and Teacher's Training, BAU, Mymensingh.

Karim. M.L. 1996. Relationship of Selected Characteristics of Kakrol Farmers with Their Problem Confrontation. *M.S. Ag. Ext. Ed. Thesis*, Department of Agricultural Extension Education, BAU, Mymensingh

Kashem, M. A. 1977. A study of the Landless Farmers of Barakhata Union Under Rangpur District.MS. *(Ag. Ext. Ed.) Thesis,* Department of Agricultural Extension Education and Teacher's Training, Bangladesh Agricultural University, Mymensingh.

Kerlinger, F. N. 1973. Foundations of Behavioral Research, Educational and Psychological Inquiry. *Rinehart and Winston Inc.* Halt, New York, U.S.A.

King, W. J. 1980 . COtton in Gambia, Report on the Cotton Development Project 1975-78.Miscellaneous Report, Center for overseas Development Administration. No. 51. 21 pp.ISBN 0-85135-109-3. Rural Development Abstract.

Mansur, M. A. 1989. Farmers Problem Confrontation in Feeds and Feeding Cattle in Sonapur Union of Rajpur Upazila Under Lakshmipur District. *M.S. Thesis,* Department of Agricultural Extension and Teachers' Training, BAU, Mymensingh.

Miles, J. and Shevlin, M. (2001). Applying Regression and Correlation: A Guide for Students and Researchers. *London: Saga Publications*.

Mingers, J. 2001. Combining IS Research Methods: Towards a Pluralist Methodology. *Info. Sys. Res.***12**(3): 240-259.

Mortuza, S. M. G. 2015. Problems Faced by the Farmers in Maize Cultivation. MS (Agril. Ext.) Thesis, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka.

MoYS 2012. The Population Category in Bangladesh. Ministry of Youth and Sports, Government of the People's Republic of Bangladesh. Retrieved from: http://www.moysports.gov.bd/

Nahid, M. M. H. 2005. Problem Confrontation of the Sugarcane Growers in Sugarcane Production. MS. Thesis, Department of Agricultural Extension Education, BAU, Mymensingh.

Prainanik, N. K. 2001. Crop Cultivation Problems of the Farm Youth in Selected Blocks of MuktagachaUpazila wider Mymensingh District.*M.S. Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh.

Raha, A. K. 1989. Deep Tube Well Irrigation Problem of the Farmers in the Cultivation of Modem Variety of Bora Paddy in Two Selected Blocks of MuktagachaUpazila under Mymensingh District.*MSc. Thesis,* Department of Agricultural Extension and Teachers' Training, BAU, Mymensingh.

Rahman, M.H. (2015). Problems and Prospects of Jackfruit Commercialization as Experienced by Farmers at Bhaluka Upazila under Mymensingh District. MS (Agril. Ext.) Thesis, Department of Agricultural Extension and Information System ,SAU, Dhaka.

Rahman, M. F. 1995. Problem Confrontation by the Pineapple Growers in a Selected Area of Tangail District.*MS Thesis,* BAU, Mymensingh

Rahman, M. H. 2006. Contraints Faced by the Banana Growers of Sonargaon Upazilla Under Narayanganj District. *MS Thesis,* Department of Agricultural Extension and Information System,SAU, Dhaka.

Rashid, M. M. 1999. Willingness of Dropout Rural Youth for undertaking Selected Agricultural Entrepreneurship in their Self-employment.*MS. Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh.

Rashid, M. Z. 2003. Participation of School Dropout Rural Youth in Selected Agricultural Activities in Two Villages of Mymensingh District.*M.S.*

(Thesis, Department of Agricultural Extension Education,BAU, Mymensingh.

Rashid, S. M. M. 2014. Empowering Farmers through e-Agriculture. MS (Ag. Ext.), Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka-1207

Saha, N. K. 1997. Participation of Rural Youth in Selected Agricultural Activities in the Villages of MuktagachaUpazila under MymensinghDistrict.*M.S. Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh.

Salam, M. A. 2003. Constraints Faced by the Farmers in Adoption Environmentally Friendly Farming Practices. *M.S. Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh

Sarker, G. C. 1983.Relationship of Selected Characteristics of the Poultry Farmers in Tarakanda Union of Mymensingh District.*M.Sc. Thesis,* Department of Agricultural Extension and Teachers' Training, BAU, Mymensingh.

Townsend, J. C. 1953. Introduction to experimental methods. International Student Edition. *New York: McGraw Hill Book Company*, Inc.

Uddin, M. J. 2004. Constraints Faced by the Farmers in Commercial Cultivation of Vegetables. *M.S. Thesis,* Department of Agricultural Extension Education, BAU, Mymensingh.

Yamane, T. 1967. Statistics: An introductory analysis, 2nd Ed., New York: Harper and Row.

APPENDIX-I

ENGLISH VERSION OF THE INTERVIEW SCHEDULE

Department of Agricultural Extension and Information System

Sher-e-Bangla Agricultural University

Dhaka-1207

An Interview Schedule for the Study Entitled

PROBLEMS FACED BY THE FARMERS IN FLOATING VEGETABLE CULTIVATION

Serial No .....

Name of the respondent**: .....**

Fathers name:……

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

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

1. Age: How old are you? .....years

2. Education : Please mention your educational status

(a) 1 cann't read or write ----

(b) I can sign only ----------

(c) I read up to class ----------

(d) Others (specify) .....

3. Family size : How many members are there in your family? .....

4. Area under floating vegetable cultivation : How much area the cultivated floating vegetables? …… decimals

5. On farm income: Please indicate your annual income (TK) from following different sources (last year)

Sl.	Source of Income	Total price (Tk)
1.	Rice	
2.	Wheat or Maize	
3.	Vegetables	
4.	Livestock	
5.	Poultry	
6.	Fisheries	

6. Off farm income

Sl.	Source of Income	Total price (Tk)
1.	Business	
2.	Service	
3.	Labor	
4.	Others(If any)	

7. Experience in vegetable cultivation

How many years are you involved in floating vegetable cultivation? ..... year/s.

8. Training Exposure

Have you received any training related to potato cultivation?

(Please Put a Tick mark)

i) YES ii) No

If YES. Then mention the name the following ones:

Sl. No.	Name of the training course	Organization	Days
01.			
02.			
03.			
04.			

9. Time spent in floating vegetable cultivation

How much time do you spend in floating vegetable cultivation? ..... hours/week

10. Media exposure: Please indicate the nature of your contact with the following information media.

Sl. No.	Media/ Sources	Nature of visit				
		Regularly	**Often**	**Occasionally**	**Rarely**	**Not at all**
1.	Experienced floating vegetable cultivated farmers					
2.	Dealers (fertilizer, pesticide)					
3.	Sub- Assistant Agriculture extension officer					
4.	Agriculture extension officer					
5.	Group discussion					
6.	Neighbor					
7.	News paper					
8.	Radio					
9.	Television					

11. Knowledge on floating vegetable Cultivation: Please answer the following questions

Sl. No	**Questions**	**Total Marks**	**Marks Obtained**
1.	Mention the suitable time for floating vegetable cultivation.	2	
2.	What are the procedures of preparing the floating vegetable seedlings?	2	
3.	What elements are needed in floating vegetable cultivation?	2	
4.	What type of temperature needed in floating vegetable cultivation?	2	
5.	What intercultural operations are practiced in floating vegetable cultivation?	2	
6.	What types of moisture are needed in floating vegetable cultivation?	2	
7.	Name two disease of floating vegetable.	2	
8.	Name two harmful insects of floating vegetable.	2	
9.	What type of irrigation needed in floating vegetable cultivation?	2	
10.	Name one control measure of disease in floating vegetable cultivation?	2	
Total		20	

12. Problem faced in floating vegetable cultivation: Please mention extent of problem faced in floating vegetable cultivation.

Sl. No	Problems	Extent of problems			
		High (3)	**Medium (2)**	**Low (1)**	**Not at all (0)**
1.	Unavailability of seedlings in time				
2.	Lack of quality seedlings				
3.	Initial cost is high				
4.	Lack of training opportunity				
5.	Shortage of organic manure for cultivation				
6.	Lack of knowledge on balanced fertilizer for vegetable cultivation				
7.	Lack of contact with extension staff				
8.	Insect attack				
9.	Pest attack				
10.	Lack of capital				
11.	In adequate credit supply of vegetable cultivation				
12.	Low demand in the local market				
13.	Boundness of the farmers to supply commodities to middle man in low price				
14.	Lack of skilled labor				
15.	Lack of coordination from extension stuff				
16.	Marketing				

Thank you for your kind co-operation.

Date:

……..…….

(Signature of the interviewer)