

**WOMEN PARTICIPATION IN HOMESTEAD VEGETABLE
PRODUCTION IN SOME SELECTED AREAS OF
PATUAKHALI DISTRICT**

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**WOMEN PARTICIPATION IN HOMESTEAD VEGETABLE
PRODUCTION IN SOME SELECTED AREAS OF
PATUAKHALI DISTRICT**

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CERTIFICATE

*This is to certify that thesis entitled, “WOMEN PARTICIPATION IN HOMESTEAD VEGETABLE PRODUCTION IN SOME SELECTED AREAS OF PATUAKHALI DISTRICT” submitted to the Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE IN AGRICULTURAL ECONOMICS**, embodies the result of a piece of bona fide research work carried out by **Sadia Sultana**, Registration No. **13-05658** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

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

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**DEDICATED
TO**

MY BELOVED PARENTS

WOMEN PARTICIPATION IN HOMESTEAD VEGETABLE PRODUCTION IN SOME SELECTED AREAS OF PATUAKHALI DISTRICT

ABSTRACT

The purpose of the study was to determine the level of participation of the women in homestead vegetable production and profitability in three unions namely Angaria, Sreerampur and Lebukhali under Patuakhali district. A structured interview schedule was applied to collect data. Data were collected from selected 90 rural women (30 from each of three unions) purposively during the period from 16 August to 30 September 2019 and Tabular and statistical technique such as Cobb-Douglas production functions were used to achieve the major objectives of the study. Results revealed that, on average 74%, 47% & 63% women predominantly involved in vegetable production and earned Tk. 234,924.00, Tk. 102,109.71 and Tk. 135,482.37.44 in the selected Angaria, Sreerampur and Lebukhali unions. Vegetables like Brinjal, Bean, Cucumber and Papaya had been the common ones in the study areas and duly used in the study to fulfill the objectives. Some socio-economic characteristics of the respondent rural women like educational level, farm size, annual family income and training experience had a significant and positive relationship with their extent of participation in homestead vegetable production. This study also identified some of the economic, technical and social problems and constrained faced by the rural women to undertake homestead vegetable production. Finally, recommendations were made to increase production of vegetables by making each inch of homestead usable.

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LIST OF CONTENTS

CHAPTER	TITLE	PAGE NO.
	ABSTRACT	i
	ACKNOWLEDGEMENT	ii
	LIST OF CONTENTS	iii
	LIST OF TABLES	vi
	LIST OF FIGURES	vii
	ABBREVIATION AND ACRONYMS	viii
CHAPTER 1	INTRODUCTION	1-10
	1.1 Background	1
	1.2 Vegetables in Bangladesh an Overview	2
	1.3 Homestead Agriculture and Characteristics of Homestead in Bangladesh	4
	1.4 Women's Contribution to Agriculture	6
	1.5 Women's Contribution to Homestead Vegetable Agriculture	7
	1.6 Objectives of The Study	9
	1.7 Justification of The Study	9
	1.8 Organization of The Thesis	10
CHAPTER 2	REVIEW OF LITERATURE	11-20
	2.1 Introduction	11
	2.2 Concluding Remarks	20
CHAPTER 3	METHODOLOGY	21-31
	3.1 Introduction	21
	3.2 Selection of The Study Area	21
	3.3 Location	22
	3.4 Selection of Sample and Sampling Technique	24
	3.5 Preparation of Interview Schedule	24
	3.6 Data Collection Period	25
	3.7 Method of Data Collection	25
	3.8 Processing, Editing and Tabulation of Data	26
	3.9 Descriptive Statistics	26
	3.9.1 Tabular Technique	26
	3.10 Statistical Technique	27
	3.10.1 Profitability Analysis	27
	3.10.2 Functional Analysis	27
	3.11 Procedure of Estimation Indicators	29
	3.11.1 Cost of Human Labor	29
	3.11.2 Cost of Seed	29
	3.11.3 Cost of Chemical Fertilizer	29
	3.11.4 Cost of Manure	30
	3.11.5 Interest on Operating Capital	30
	3.11.6 Cost of Land Use	30
	3.12 Calculation Return	31

	3.12.1 Gross Return	31
	3.12.2 Gross Margin	31
	3.12.3 Net Return	31
	3.12.4 Undiscounted Benefit Cost Ratio (BCR)	31
CHAPTER 4	SOCIOECONOMIC CHARACTERISTICS OF SELECTED RURAL WOMEN	32-47
	4.1 Introduction	32
	4.2 Marital Status of the Selected Rural Women	32
	4.3 Age Distribution of The Selected Rural Women	33
	4.4 Farming Experience of The Selected Rural Women	34
	4.5 Family Size of The Selected Rural Women	34
	4.6 Educational Level of The Selected Rural Women	35
	4.7 Sources of Vegetable Seed used by The Sample Respondent	36
	4.8 Training Facility of The Selected Rural Women	37
	4.8.1 Name of Training Institution	38
	4.9 Level of Income of The Selected Rural Women	39
	4.10 Annual Expenditure of The Selected Rural Women	40
	4.11 Occupational Status of The Selected Rural Women	41
	4.12 Distribution of Average Homestead Area by The Sample Respondent	42
	4.13 Vegetables Grown in Homestead by Selected Rural Women	43
	4.14 Management Practices of Homestead of Selected Rural Women	44
	4.15 Labor Use Pattern of Homestead Vegetables Production Activities	45
	4.16 Decision Making and Work responsibility of Selected Respondents	46
	4.17 Disposal Pattern of Vegetables Grown in Homestead	47
	4.18 Concluding Remarks	47
CHAPTER 5	FINANCIAL PROFITABILITY OF HOMESTEAD VEGETABLE PRODUCTION	48-57
	5.1 Introduction	48
	5.2 Estimation of Variable Costs of Vegetable Production	48
	5.2.1 Cost of Human Labor	49
	5.2.2 Cost of Seeds	49
	5.2.3 Cost of Chemical Fertilizers	50
	5.2.4 Cost of Manure	50
	5.2.5 Interest on Operating Capital	51
	5.2.6 Total Variable Cost	51
	5.3 Estimation of Fixed Costs of Homestead Vegetable Production	52
	5.3.1 Rental Value of Land Cost	52
	5.3.2 Total Fixed Cost	52
	5.4 Total Cost	53
	5.5 Estimation of Returns of Homestead Vegetable Production	55
	5.5.1 Gross Return	55

	5.5.2 Gross Margin	55
	5.5.3 Net Return	55
	5.5.4 Benefit Cost Ratio (Undiscounted)	56
	5.6 Concluding Remarks	57
CHAPTER 6	FACTORS AFFECTING PRODUCTION OF HOMESTEAD VEGETABLES	58-63
	6.1 Introduction	58
	6.2 Functional Analysis for Measuring Production Efficiency	58
	6.3 Estimated Values of Production Function Analysis	59
	6.4 Interpretations of Results	60
	6.4.1 Constant or Intercept Term	60
	6.4.2 Seed Cost	61
	6.4.3 Human Labor Cost	61
	6.4.4 Urea Cost	61
	6.4.5 TSP Cost	61
	6.4.6 MOP Cost	61
	6.4.7 Manure Cost	61
	6.4.8 Coefficient of Multiple Determination (R^2)	62
	6.4.9 Adjusted R^2	62
	6.4.10 Goodness of Fit (F-Value)	62
	6.4.11 Returns to Scale	62
	6.5 Concluding Remarks	63
CHAPTER 7	PROBLEMS OF HOMESTEAD VEGETABLE CULTIVATION	64-69
	7.1 Introduction	64
	7.2 Major Problems Reported by Rural Women	64
	7.2.1 Attack by Pest and Diseases	64
	7.2.2 Lack of Storage Facility	65
	7.2.3 Inadequate Supply of Good Quality Seeds	65
	7.2.4 Lack of Scientific Knowledge and Technology	66
	7.2.5 Lack of Adequate Transportation Facility	66
	7.2.6 Non-availability and High Wage Rate of Labor	66
	7.2.7 Low Market Price of Product	67
	7.2.8 Insufficient Water Supply During Dry Season	68
	7.2.9 High Prices of Inputs	68
	7.2.10 Vegetables Damaged by Poultry or Livestock	68
	7.3 Concluding Remarks	69
CHAPTER 8	SUMMARY, CONCLUSION AND RECOMMENDATIONS	70-75
	8.1 Summary of The Study	70
	8.2 Conclusions	73
	8.3 Recommendations	74
	8.4 Limitations of The Study	75
	REFERENCES	76-80

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
1.1	Vegetable-Based Cropping Patterns in Bangladesh	3
4.1	Marital Status of The Selected Respondents in the Study Area	32
4.2	Age Distribution of The Selected Respondents in The Study Area	33
4.3	Farming Experience of The Selected Respondents in The Study Area	34
4.4	Family Size of The Selected Respondents in The Study Area	35
4.5	Level of Income of The Selected Respondents in The Study Area	39
4.6	Annual Expenditure of The Selected Respondents in The Study Area	40
4.7	Distribution of Average Homestead Area by The Sample Respondent	43
4.8	Vegetables Grown in In Homestead by The Rural Women	44
4.9	Labor Utilization Pattern of Vegetable Production Activity	46
5.1	Per Hectare Level of Input Used for HVP	53
5.2	Per Hectare Cost of HVP in The Study Areas	54
5.3	Per Hectare Profitability of HVP in The Study Areas	56
6.1	Estimated Values of Co-Efficient and Related Statistics of Cobb-Douglas Production Function	60
7.1	Major Problems Faced by The Rural Women	67

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1.1	GDP From Agriculture in Bangladesh	1
1.2	Trend of Total Vegetable Production in Bangladesh	4
3.1	Map of Patuakhali District	23
4.1	Educational Level of The Selected Rural Women in the Study Area	35
4.2	Source of Vegetable Seed Used by The Sample Respondent	36
4.3	Training Facilities of The Selected Respondents	37
4.4	Name of Training Institution	38
4.5	Occupation Status of the Selected Respondents	41
4.6	Management Practice of Homestead Vegetables by The Rural Women	45
4.7	Decision Making and Work Responsibility of The Respondent in The Study Areas	46
4.8	Disposal Pattern of Vegetable Grow in Homestead	47
5.1	Percentage of Variable and Fixed Cost to Total Cost of HVP	51

ABBREVIATION AND ACRONYMS

AVRDC	Asian Vegetable Research and Development Center
BNFE	Bureau of Non-Formal Education
BBS	Bangladesh Bureau of Statistics
BCR	Benefit Cost Ratio
BER	Bangladesh Economic Review
BAU	Bangladesh Agricultural University
DAE	Department Agricultural Extension
DAP	Di Ammonium Phosphate
et al.	And Others (At All)
etc.	Et Cetra (Others and So Forth)
FY	Fiscal Year
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GNP	Gross National Product
GR	Gross Return
GM	Gross Margin
HYV	High Yielding Varieties
ha	Hectare
HVP	Homestead Vegetable Production
IOC	Interest on Operating Capital
i.e.	That Is
Kg	Kilogram
ln	Natural Log
MT	Metric Ton
MOP/MP	Muriate Of Potash
NR	Net Return
No.	Number
SPSS	Statistical Package for Social Sciences
TSP	Triple Super Phosphate
TVC	Total Variable Cost
TC	Total Cost
%	Percentage

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 Background:

Bangladesh has a prodigiously agricultural economy. Agriculture accounts for 12.68% of its gross domestic product (GDP) and absorbs 37.5% of the country’s labor force. GDP from Agriculture in Bangladesh increased to 11023.20 BDT Million in 2020 from 10799.10 BDT Million. (Fig 1.1).

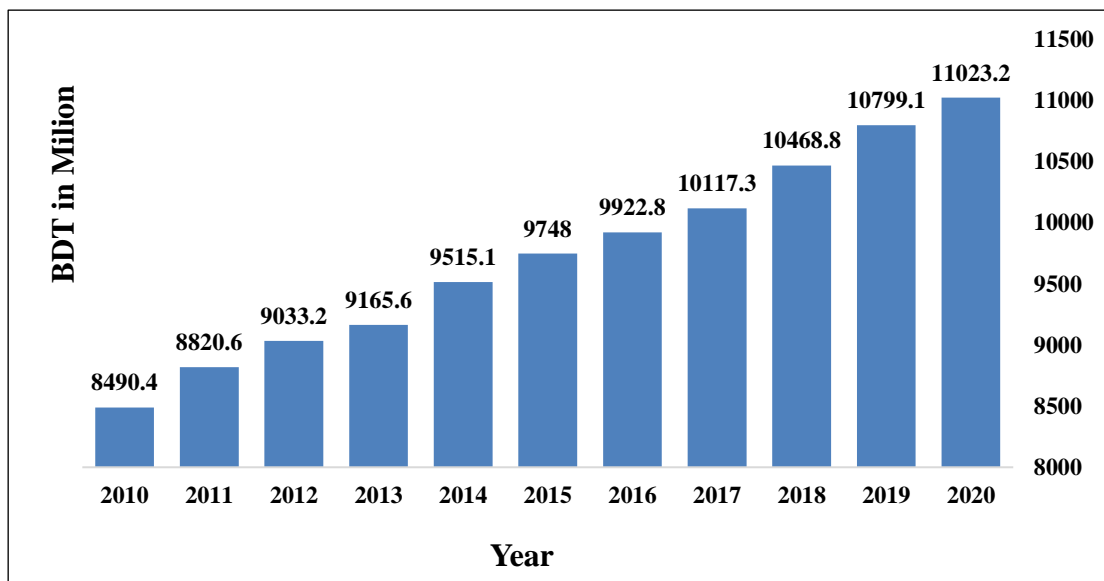


Figure 1.1: GDP from Agriculture in Bangladesh

Source: BBS, 2020

Sustained government investment in irrigation facilities, rural infrastructure, agricultural research and extension services has helped Bangladeshi farmers achieve dramatic increases in agricultural production. The process of agricultural production is, however, fortified by the increasing use of agrochemicals and multiple cropping, hence significant production transformation has been achieved and food production has more than doubled since independence in 1971. These have mostly supported the country’s large population base rather than uplifting their living standards. Hence food security still remains a major development issue and the government of Bangladesh has called for a departure from “rice-led” growth to a more diversified production base that includes several non-rice crops Diversification into vegetable crops and increasing commercialization can support the development of the agricultural sector in several ways. Commercialization is characterized by households moving from subsistence

systems into semi-commercial and commercial systems (with the main objective of achieving food self-sufficiency), thereby maximizing profits and generating surplus. It implies increased market transactions since farmers participate in the process to capture gains from specialization. Similarly, increasing capital intensity in production and processing leads to growth in the agribusiness sector. As a result, the number of agro-processing, distribution and farm-input provision companies increases. Commercialization can take place on the output side—when the farmer sells their products on the markets or on the input side with increased use of purchased inputs.

If these changes take place, and income and employment opportunities subsequently grow causing an increase in real wages, then increasing commercialization and the development of agribusiness contribute to overall growth and economic development. Yet, little is known on how commercialization-led income growth is actually distributed among different social groups, and whether it actually reduces poverty or how it affects women as compared to men

1.2 Vegetables in Bangladesh an Overview

More than 60 types of vegetables of indigenous and exotic origin are grown in Bangladesh. Based on the growing season, vegetables are categorized as summer/rainy season vegetables, winter season vegetables, and all-season vegetables. Of the summer vegetables, various cucurbits, vegetable cowpea, hyacinth bean, stem amaranth, several aroids and Indian spinach are predominant. Winter vegetables include tomato, cabbage, Chinese cabbage, cauliflower, eggplant, carrot, spinach, bottle gourd, bush bean and radish. Crops like okra, heat-tolerant tomato, eggplant, carrot, spinach, many leafy vegetables and small onion are grown all year round. Summer vegetables are cultivated during the monsoon season from May to October. On the other hand, winter vegetables are grown from November to April. The production of vegetables is higher during winter (60 to 70%) and most districts produce marketable surplus during that season.

Table 1.1: Vegetable-based Cropping Patterns in Bangladesh

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lowlands	Rabi crops (cont.): Maize, watermelon, onion, chili, pulses, oilseeds				Rice/fish integration			Rabi crops (beginning)				
					Sesame, groundnut, jute							
Medium elevation lands	Rabi crops (cont.): Maize, watermelon, onion, chili, pulses, oilseeds			Summer vegetables			aman specialty rice			Rabi crops (beginning)		
	Rabi crops (cont.): Maize, watermelon, winter vegetables, onion, chili, pulses				HYV aman specialty rice			Rabi crops (beginning)				
Highlands	Cotton (cont.)				Summer vegetables, jute			Cotton (beginning)				
	Perennials (banana, papaya, sugarcane) intercropped in the first rabi season with pulses, oilseeds or vegetables											

Source: Faruqee (1998)

Although a very small portion of cultivable lands are being used for vegetable cultivation, its production has seen a significant rise 37.63% between 2013-14 and 2018-19 fiscal years.

According to the Department of Agricultural Extension (DAE), around 26.7 million tons of vegetables were produced on around 1.25 million hectares of land in the 2018-19 fiscal year. Furthermore, an extra 2.65 million tons were produced in 2017-18, compared to 2016-17. Moreover, around 20 million tons were produced in 2015-2016 fiscal year, while the figure stood at a little over 21.04 million tons in 2014-15. Data from the DAE showed that the amount of land in which vegetables are being cultivated rose by almost 29%, to nearly 1.25 million hectares in 2018-19 -- from only 968,827 hectares in 2013-14.

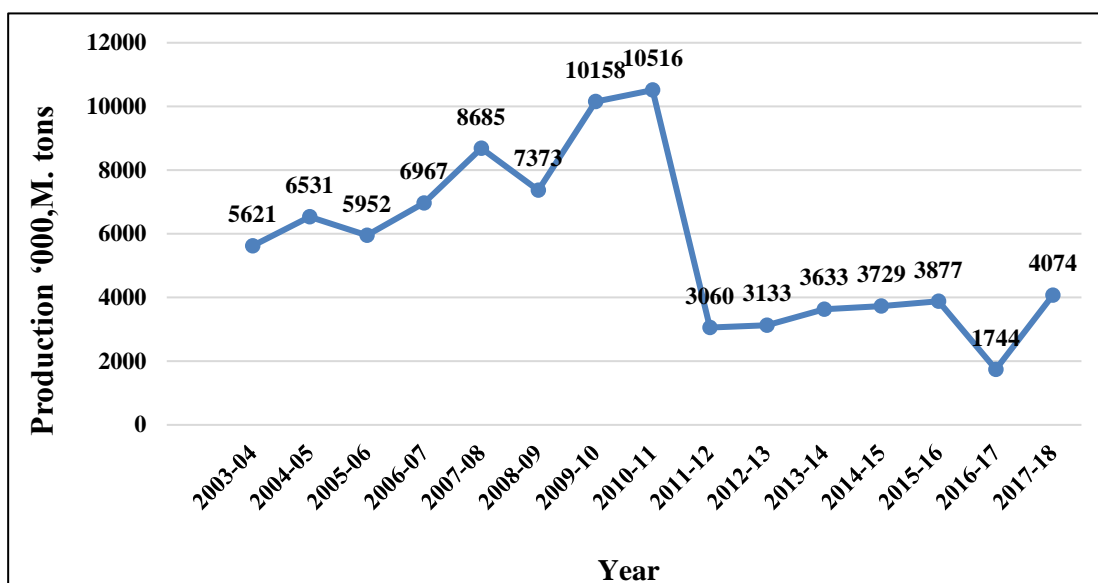


Figure 1.2: Trend of Total Vegetable Production in Bangladesh

Source: BBS, 2018

However, statistics from Bangladesh Bureau of Statistics (BBS) in 2018 showed that a little over 2.63% of the cultivable land was being used for vegetable cultivation in the country. Even though Bangladesh has a long way to go before meeting its national demand of vegetables it is currently exporting 50 varieties of vegetables to some 118 countries.

1.3 Homestead Agriculture and Characteristics of Homestead in Bangladesh

Homestead has special significance in the context of Bangladesh where about 62 per cent of farmers are landless. Homestead agriculture may be a lifeboat for their survival and existence because of a secured supply of food, petty cash etc.

Homestead, the home and adjacent grounds occupied by a family, is the potential production area in Bangladesh, especially for the resource poor group. Homestead production system, which is popularly called homestead agroforestry or home gardening (the integrated production of crops, trees, and/or livestock in the household's residence and its surrounding areas), has been playing an important role in the rural economy of Bangladesh since ancient times, and providing various essential products and services to millions of rural households. The size and structure of homesteads are linked to economic, social, and ecological factors usually ranges on an average from 0.004 to 0.08 hectare. The homesteads are generally small in size but numerically they

are increasing steadily with population. Population pressure and subsistence economy have forced the households to utilize all the sites of a homestead as individual production units. It combines all farming components and forms a highly intensive and multi-strata integrated production system depending on household needs, preferences and knowledge. The homestead agroforestry provides multiple products to the household and meets the varied needs including food, nutrition, and energy securities, producing a wide variety of fruits, vegetables, and tree products. It also contributes to household income and saving through sales of vegetables, fruits, and other tree products, and to the creation of employment opportunity particularly for the women. Collectively, homestead production system contributes about 70% fruit, 40% vegetable, 70% timber, and 90% firewood and bamboo requirement of the country

Homesteads serve as the home for biodiversity conservation, which is a serious ecological issue in Bangladesh. They are also used as processing centers for the poor households. Homestead, being the residential part of a household, enables the women, who constitute almost half of the labor force in Bangladesh, to efficiently manage homestead activities. Planting improved plant species, optimum management of the resources, efficient processing, and marketing of the products could contribute significantly to the livelihood of the poor.

The production of homestead vegetables provides the household with direct access to important nutrients that may not be readily available or within their economic reach. Home gardening has been shown to be a source of additional income for the household through the sale of garden produce after family consumption. Studies suggest that this additional income is generally utilized to purchase additional food items, further increasing the diversification of the diet.

Women are the main caretakers of the garden, which empowers them, ensures better utilization of the income from the garden for food, and increases family welfare. All these benefits are important contributions towards poverty alleviation.

1.4 Women's Contribution to Agriculture

The rural economy in the country has become more diverse and dynamic over the past few decades due to its sustained growth. Corporate presences including contract-based production is now clearly visible in the sector. Agro-based industrialization is bringing dynamism to the country's rural milieu. Against this backdrop, the contribution of womenfolk to the agriculture sector carries much significance.

The involvement of women in agricultural jobs was incorporated for the first time in the labor force survey of 1995-96. Tasks like cattle rearing, poultry farming, paddy husking, boiling and drying, processing and preservation of food were included in it as economic activities. These tasks are mostly carried out by women in the villages. There are also other jobs performed by women that are not viewed as economic activities. The labor force survey of 2005-06 showed that 48.1 per cent of 15-years-plus population in Bangladesh was engaged in the agriculture sector. According to that survey, 41.8 per cent among men and 68.1 per cent among women in the labor force were directly engaged in agricultural work. It showed that the agriculture sector was not only the largest sector with regard to employment generation, it was also the largest arena for women's participation and social dynamism. The participation of men in the agriculture sector has diminished by over 10 per cent during the previous decade. This void has in fact been filled up by female workers.

The largest employment generating sectors are agriculture, forestry and fishing, in which sectors female participation is 63.1 percent and male participation is 34 percent across the country, according to the latest statistics (Quarterly labor force Survey 2015-16) of Bangladesh Bureau of Statistics (BBS). At present, over 70 per cent of female workers are engaged in the agriculture sector that includes forestry and fisheries. The number of women workers in the sector has increased by over 4.5 million during the previous decade from 3.7 million in 2005-06. Their active participation is noticed in spraying of ash as fertilizer, use of different organic materials on the upper layer of soil, Joom cultivation on the hills, etc. The tangible contribution of women in crop production is estimated to be about 27 per cent. Women folk participate in 17 of the 21 stages in crop production cycle. Vegetable production has increased five-folds during the previous few decades due to explosion of its cultivation mostly by women. They

are playing a crucial role in the expansion of horticulture and gardening in the country. They are also environment-friendly and play a supportive role in activities like tree plantation, forestation, land conservation, preservation of bio-diversity, etc.

Although the contribution of womenfolk in agriculture sector is huge, they lack state recognition. According to one estimate, five million among the 13 million unpaid workers added during the previous decade were females. Experts suggest that in addition to unpaid family work, 77 per cent rural women work from dawn to dusk in agricultural pursuits alongside their male counterparts. Despite that, the state does not give them due recognition and importance. They have also not been linked to policies and strategies for agricultural development. Although over 14 million farmers' cards have been distributed all over the country, the share of women in these is quite negligible. In the absence of recognition as farmers, they are also not eligible to receive agricultural insurance coverage and other facilities offered by the government.

In addition, women also face wage discriminations compared to men. Their lack of right over family property is also widespread, which remains unspoken and unresolved. State incentives are urgently needed for establishing the rights of female agricultural producers over inputs including fertilizers and irrigation. They need technical help in the form of training and financial assistance in the shape of credits for sustaining their productive activities. These female farmers and workers in the sector should be accorded due importance and recognition for strengthening and modernizing agriculture.

1.5 Women's Contribution to Homestead Vegetable Agriculture

Bangladesh is an agro-based over-populated country. About 70 percent of 10 million farm households have below one hectare of land (small farm) Thus, homestead farming is the most significant system of production in rural Bangladesh. In Bangladesh, women hardly participate in agricultural activities outside their homes. About half (49 percent) of the population of Bangladesh is women among them 45.6 percent are associated with the farming activities Women's participation in rural development, more particularly in agricultural development in Bangladesh, is the most important strategy. Bangladeshi women play a significant role in agricultural production. Although rice is the dominant

crop, vegetable occupy a very important place in rice-based cropping systems and play a distinct role in the crop sub-sector to provide nutritious food to the dwellers, generate income, employment and goods to trade. Vegetables are essential in diet, provide fiber, trace minerals, vitamins and proteins. Vegetables help to prevent various diseases resulting from malnutrition and unbalanced nutrition. Climate and soil of Bangladesh are very much suitable for growing vegetables round the year. Improved production technologies for field crops is not of value to them as they have neither enough land nor access to high cost inputs. But minimum level of vegetable intake is 200 g person⁻¹ day⁻¹ recommended by Asian Vegetable Research and Development Center (AVRDC)

Many vegetables are grown in homestead. Homestead is the dwelling place and it is the center where vegetables are cultivated. Homestead as defined by Abdullah (1986), is the land owned and occupied by the dwelling unit of the household and immediate area surrounding by the dwelling unit including courtyard, pond, road space around homestead, space used for cultivation of trees and vegetable and unutilized space. Cultivable land is a scarce resource in densely populated Bangladesh, which is mostly used for grain crop production. Many vegetables are grown in homestead such as cabbage, carrot, eggplant, cauliflower, tomato, radish, sweet gourd, wax gourd, bitter gourd, teasel gourd, pointed gourd, etc. Much care is not taken or necessary for growing these vegetables in Bangladesh (Weinberger and Genova, 2005). Little attention is given to cultivate these vegetables, though these are very important source of human nutrition. There is a great scope for increasing the production of vegetable throughout the year. Thus, homestead farming is the most significant system of production in rural Bangladesh. They make these contributions by participating in pre and post-harvest operations and in various activities under homestead agriculture. These are in addition to their traditional role of housekeeping and child rearing.

Assessment of the role of women in household activities particularly in homestead vegetable production is therefore, important particularly for policy formulation and programs interventions for development of women. Approximately 45 percent of our rural people are landless and about 55 percent of the land owners are small farmer. (Anonymous, 2011). Al-Mamun et al. (2010) argues that home gardening activities are centered on women and it can also increase the income of women, which may result in the better use of household resources and improved caring practices and empowerment.

This empowerment of women also addresses a priority area of poverty alleviation and provides important socio-economic returns through lower health and welfare costs, lower fertility, and lower maternal and infant mortality rates. Thus, the simultaneous impact of home gardening programs in terms of giving women a voice and promoting their full participation in domestic life can make an important contribution to the overall development of communities as well as national income level.

Women from landless and marginally landless rural families cultivate different kinds of vegetables in their homestead. Undoubtedly, women can play a vital role if their full talent can be explored in homestead vegetable cultivation. If women can perform their roles in homestead vegetable cultivation properly and skillfully, they will be able to ensure food security and family nutrition, increase family income and contribute to the overall improvement of Bangladesh. So, when rural women are involved and included with this development activities and are aware of their rights and claims, their participation in homestead vegetable cultivation will be increased to a great extent.

1.6 Objectives of The Study

The specific objectives of the study are as follows:

- 1) To find out the socio-economic characteristics of the respondents;
- 2) To determine the profitability of homestead vegetable production;
- 3) To identify the factors affecting homestead vegetables production;
- 4) To identify the problem faced by women in homestead vegetables production in the study area.

1.7 Justification of The Study

Patuakhali is situated in the Southwestern part of Bangladesh adjoining to the Bay of Bengal makes it bio ecologically ever dynamic and rich in homestead biological resources. Most of the land in this area is low and suffers from salinity problems. Climatic change i.e. rising sea level, cyclone and drought seriously affect the homestead biodiversity. A recent study by Miah and Bari, 2002, found that the number and productivity of homestead plantations, particularly sweet water loving fruit species have been declining in recent years due to increasing soil salinity in water which will

ultimately affect the direct socio and economic status of the inhabitants. Women's involvement in homestead vegetable is a common practice. But adequate research has yet not been focused in this area of study although such women centered production of homestead vegetables provides the household direct socio and economic benefits. also increase the income of women, which may result in the better use of household resources and improved caring practices and empowerment. the present study was an attempt to analyze and find out the costs and returns of selected year-round vegetable production and return from different inputs used and so on examine the labor utilization pattern especially the use of female labor in respect of homestead vegetable production. Keeping above facts in mind this study has been proposed to collect systematic information about Women participation in homestead vegetable production in some selected areas of Patuakhali district.

The present study will be able to identify some major problems of homestead vegetable production. The study will also provide information to the researchers, who are interested in conducting related studies in future.

1.8 Organization of The Paper

This thesis is divided into nine chapters which are organized in the following sequence. Chapter 1 deals with the introduction of the study. The introductory chapter gives objectives, justification and outline of the study. Chapter 2 gives a brief review of literature on profitability, comparative advantage analysis, constraints of vegetable production. Subsequently, the methodology of the study that is how the study was conducted is discussed in chapter 3. Chapter 4 represents the socio-demographic profile of the selected rural women. Chapter 5 describes financial profitability of homestead vegetable production of selected rural women in the study area. Chapter 6 describes the factors affecting production of homestead vegetable. Chapter 7 highlights the problems associated with homestead vegetable production. Chapter 8 represents summery, conclusion and recommendations.

CHAPTER 2

REVIEW OF LITERATURE

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

The main objective of this chapter is to review some related studies in relation to the current one. The present study is concerned with the participation of women in homestead vegetable production in some selected areas. So far, only a few studies have conducted economic studies on homestead vegetable production in Bangladesh. Very few being conducted to connect women contribution in vegetable production to economic activity. Again, some of these studies may not be fully relevant to the current study, but their findings, analysis method, and suggestions have a major impact on the current study. The assessment of some research documents that are relevant to the current investigations that have been conducted in the recent past are discussed below:

Mahmud (2001) conducted a study on “Participation of the tribal women in homestead vegetable production program in Madhupur upazila of Tangail district”. Data were collected from 100 tribal women who engaged in homestead vegetable production using face to face interview schedule and simple random sampling method used. Almost all of them (96%) were married and the rest were either widower or divorced. Two-third of the respondents (67%) received training. Of them (32%) received training on vegetable production of farms. A large majority of the respondents (77%) discussed with their neighbors concerning problems on agriculture related information and how to solve the problems associated with homestead vegetable production technologies. Most of them (60%) had no contact with upazila Agriculture Officer. Similarly, 47% and 35% of the respondents had no contact with Agriculture Extension Officer and Block Supervisor severally. This indicates that they had a very little contact with the extension professionals. Annual income, farm size, participation in training program and attitude of tribal women were found to have significant relationships with their participation in homestead vegetable production system.

Hasan (2005) examined “An economic analysis of contract farming for the production and export of high value vegetables in Bangladesh”. The overall result of the study was that the export quality of fresh vegetables was considerably affected by the price. Per hectare gross margin for the production of green beans, bitter gourd and okra contracted

was Tk. 181548, Tk. 261395 and Tk. 95057 whereas Tk. 88070, Tk. 112053 and Tk. 18522 for the production of cauliflower, bitter gourd and okra without a contract, severally. The study also identified issues and limitations related to supply chain and marketing management for the production and export of high value vegetables.

Parvin (2008) studied that “An economic study on alternate rice and vegetables production in selected area of the Mymensingh district”. he showed that alternative rice and vegetable production was profitable from the perspective of marginal, small and large farmers. The average family size of all farmers was 5.67, which was comparatively higher than the national average 4.48. About 50% of the heads of households of the sample’s farmers had some level of education and farming was the main occupation of the farmers. Lady’s finger, white gourd, cabbage, Aman rice, and Boro rice, were produced mainly within the study areas and per hectare net yield of production of these crops were Tk.86898, Tk. 99000, Tk. 89640, Tk. 3896 and Tk. 23581 respectively and farmers made the greatest income from producing white gourd among the selected vegetables.

Sonia (2009) concluded a study on “Adaptation of vegetable cultivation in selected area of Patuakhali district”. The study was carried out within three villages of Dumki upazila under the district of Patuakhali. Simple random sampling method was used to collect data from 90 respondents through a personal interview by using interview program. Results showed that majority of the respondents (97%) had low to medium level adaptation of the vegetable cultivation. Majority of the respondents (24%) collected potato seeds from BADC, followed by brinjal (20%). The majority of the respondents who used vegetable seeds from the open market were brinjal (40%) followed by Indian spinach (38%) and who used vegetable seeds for their own livelihood were bean (87%) and brinjal (BARI Begun-5) (87%) followed by tomato (86%). (77%) respondents used Brinjal (BARI Begun-4) for commercial purpose followed by (64%) tomato, (64%) brinjal variety (BARI Begun-6). Farm size, annual income, extension contact and attitude of the respondents towards growing vegetables had significant positive relationship with their adaptation of vegetable cultivation. It may be concluded that any attempt to raise extension contact and attitude towards vegetable cultivation would be useful to accelerate the adaptation of vegetable cultivation among the farmers within the study areas.

Nahar (2009) conducted a study on “An economic study of year-round vegetable production in selected areas of Jessore district”. He studied year-round vegetables namely bean, cucumber, snake gourd and cabbage in two villages namely Haibatpur and Bari Bazar upazila in the district of Jessore. Simple random sampling method was followed for collecting data from 60 respondents. It revealed that all of the vegetables were profitable. The vegetable production area represented around 28 percent of the total land. Per ha gross cost of bean, cucumber, snake gourd and cabbage were Tk. 110617, Tk. 111262.4, Tk. 86527 and Tk. 102960 severally. Per ha gross return of these vegetables accounted Tk. 200000, Tk. 202000, Tk. 152000 and Tk. 180000 respectively and their estimated net return were found to be Tk. 89383, Tk. 90737.6, Tk. 65473 and Tk. 77040 severally. Undiscounted benefit cost ratio of producing per ha bean, cucumber, snake gourd and cabbage were 1.81, 1.82, 1.76 and 1.75 respectively. Farmers gain highest profit from cucumber vegetable considering three vegetables.

Mamun et. al (2010) conducted a study on ‘Homestead vegetable cultivation: Food security and income’. A field survey was conducted at Raichow village under Comilla district to investigate the homestead vegetable production and its impact on family nutrition and income generation and involvement of female members to this activity. A total of 125 homesteads were selected randomly through a structured questionnaire. On the basis of farm category highest number of farmers are marginal (44%), followed by landless (28%). In respect of total cultivated percent of households are highest in marginal group (46.9%) followed by small (36.8%) and medium (28.9%) group. The highest amount of vegetables was produced by the large farmer (1230.20 kg/year) followed by small (780.67 kg/year) and marginal (540.50 kg/year) and landless (260.50 kg/year) farmer. Production, consumption and distribution of vegetables increased from landless towards large farmer while selling increased towards poor farmers. The highest total income (Tk. 15992.60/year) and net income (Tk. 14542.60/year) were obtained from large farmer followed by marginal and landless farmer.

Chowdhury (2011) studied on “A comparative economic analysis of small scale and commercial vegetables production in selected areas of Gazipur district”. He concluded that commercial Rural Women in the Gazipur district earned the highest profit than small scale Rural Women. He showed that per hectare BCR of brinjal, bitter gourd, teasel gourd production in small-scale were 1.91, 1.46 and 1.63 respectively while the

production of BCR on a commercial scale was 2.35, 1.73 and 1.95 respectively. Cobb Douglas production function model revealed that small producers allocated their resources in the decreasing yield zone and commercial producers in the increasing yield zone. The study also revealed that growing brinjal was relatively more profitable than producing bitter gourd and teasel gourd. He also concluded that there appears to be considerable scope to increase the income, employment and nutritional status of both small scale and commercial scale farmers.

Chowdhuri et al. (2014) studied that “Profitability analysis of winter vegetable production in a selected area of Narshingdi district in Bangladesh”. This study was intended to analyze the production, costs, yield and profitability of the production of three winter vegetables (brinjal, beans, cabbage) from three vegetables in Narshingdi district in Bangladesh. To attain the objectives simple random sampling technique followed for collecting data from 60 farmers. The major findings of the study were among the winter vegetables, cabbage production was more profitable. Per hectare profitability of growing vegetables from the viewpoints of individual farmer was measured in terms of gross return, gross margin and value addition. Per hectare gross costs of brinjal, bean and cabbage production were 241277 Tk, 162237 Tk. and 204,152 Tk respectively and per hectare average yield of brinjal, bean and cucumber were estimated at 24,175 kg/ha, 15,774 kg/ha and 24,707 kg/ha respectively. Per hectare gross return of three vegetables were Tk. 483500, Tk. 347028, and Tk. 494140 respectively. Per hectare net yield of three vegetables were estimated at Tk. 242223, Tk. 184691 and Tk. 289988 respectively. It shows that the production costs per were higher for brinjal than for cabbage and beans. But yield per hectare, gross yield, gross margin, net yield and benefit cost ration of cabbage was higher than for beans and brinjal. The functional analysis indicated that gross yield and per hectare was considerably influenced by the use of human labor, tillage, seeds, fertilizers, irrigation and pesticides. These factors were directly and collectively responsible for the influence on gross yield of these three vegetables.

Hasan et al. (2014) examined “Profitability of important summer vegetables namely bottle gourd, brinjal and cucumber in Keranigonj upazila in Bangladesh”. Purposive sampling method was used for Data collection. The study found that benefit cost ratios (BCR) considering the variable cost were 2.83, 4.88 and 4.57 for bottle gourd, brinjal

and cucumber respectively. The study revealed that among the three vegetables brinjal production is more profitable in the study area. The highest BCR was for brinjal (3.72) and the lowest for bottle gourd (2.40) based on total cost. The main problems identified by the study were the lack of capital, low price of production, high price of inputs, the fluctuation of prices and lack of storage facility etc. and various suggestions were also given to overcome their problems by the farmer in the study area.

Noyon (2014) under look “Production and marketing profitability of pesticide free vegetables initiated by PKSf in Dhaka, Bangladesh”. For profitability of vegetables he selected five vegetables namely (brinjal, wax, sponge gourd, cucumber and bitter gourd). After analysis of the data he found per hectare yields of brinjal, wax, sponge gourd, cucumber and bitter gourd were 28880 kg, 35240 kg, 39124 kg, 36763 kg and 43414 kg respectively. Per hectare BCR of brinjal, wax, sponge gourd, cucumber and bitter gourd were 2.20, 1.86, 1.87, 1.85 and 1.95 respectively.

Bithi (2014) conducted a study on “Comparative economic analysis of bean and bottle gourd production in selected area of Gopalganj district”. For this comparative economic analysis of two vegetable 60 farmers were selected of which 30 were bean and 30 were bottle gourd producers by using simple random sampling method. The study conducted in two villages under Gopalganj sadar and Muksudpur upazila in Gopalganj. Both tabular analysis and Cobb-Douglas production function used to achieve the objective. It revealed that selected winter vegetables were profitable to produce. Per ha total costs of production of bean and bottle gourd were Tk. 148183 and Tk.156434 respectively and the corresponding gross incomes were Tk. 242500 and Tk. 305000 respectively. The estimated net return of producing bean and bottle gourd were Tk. 94317 and Tk. 148566 respectively. However, for production of two winter vegetable net and gross yield were the highest for bottle gourd followed by bean. It was also found that there was a large variation of yield in producing bean and bottle gourd production and the factors that human labor, irrigation, manure and fertilizers were directly or jointly responsible for the variation of yields.

Olowa et al. (2015) stated that “Gender issues of labor participation in vegetable production in Ikorodu Local Government Area of Lagos State”. He conducted to identify gender tasks and roles in vegetable production with the ultimate aim of higher targeting resources within the agricultural sector. A multi-stage sampling technique was

used to collect data from 120 Rural Women. Pearson's correlation coefficients were estimated to verify the association between female participation and certain socioeconomic variables. 65.61% of women and 30.36% of market gardeners have received a formal education while none of the market gardeners have a post-secondary education. The study estimated that the role of women in the majority of cases was supportive, while the dominant role in most cases was played by men. The study found that although women dominate some market gardening operations but overall male participation is more important. The correlation analysis discovers that age, marital status, farming experience and farm size were positively associated and education was unrelated to women's participation in vegetable production. It was suggested that projects and programs should be designed to increase vegetable production to respond to the complementary role of farmers.

Afrin (2015) carried out a study on "Reduction of food insecurity through homestead vegetable production in Mymensingh district". Simple random sampling method followed for collecting data from 100 rural farmers through personal interview. The study was conducted within the Bhaluka, Trishal and Gaforegaon union of Mymensingh district. Five vegetable crops namely brinjal, cabbage, amaranth, bottle gourd, bean was introduced into the existing cropping pattern. Farm size, annual family income, extension contact, agricultural training, attitude perspective towards homestead agriculture showed vital positive relationship with their reduction of homestead vegetable production. Two other variables specifically, age and education of the farmers had no vital relationship with their reduction in homestead vegetable production. Reducing food insecurity through the production of homestead vegetable was the dependent variable and nine selected characteristics of the respondents were the independent variables of this study. The results revealed that largest proportion (73% of the farmers had moderately food insecure when homestead vegetable production compared to 20% and 7% who had low and high food insecure condition severally. Based on the descending order of the Problem Confrontation Index (PCI) insufficient agricultural land, lack of capital or fund and lack of quality seed were main issues faced by the farmers in production of homestead vegetables.

Islam et. Al (2015) 'Conducted a study on Enrichment of homestead vegetation through agroforestry practices in the remote coastal areas of Bangladesh'. The study was

conducted in Rangabali island of Patuakhali district and two villages of Char Kukri-Mukri island of Bhola districts. A total of 62 households were selected randomly from three char villages for this study. A total of 19 different tree species (8 timber and 11 fruit species) were planted in both the islands with success of 52 homestead at Rangabali and 54 trees/homestead at Char Kukri-Mukri. The highest survival was found for tamarind (54.0%) followed by guava (52.82%), coconut (52.18%), mango (51.25%), jackfruit (51.25%), betel nut (50.78%) and tal (40.62%) in Rangabali. In Char Kukri-Mukri, the highest survival was found for kalo jam (53.80%) followed by betel nut (51.66%), jackfruit (51.33%), coconut (49.66%), tamarind (49.52%), mehogoni (49.12%), guava (47.84%), rain tree (45.45%) and akashmoni (44.0%). In both the study areas, there has been found significant growth and short-term vegetable production that contributes to secure household foods and economic benefits. The study suggests that small-scale agroforestry is increasingly needed for newly settled coastal homesteads for enriching vegetation and improving livelihood capacity of poor farmers.

Jahan and Khatun (2016) carried out a study on “Women participation in summer vegetables production in a selected area of Mymensingh district”. Simple random sampling method used for obtaining primary data from 45 summer Rural Women in Char Ishawardi village under Sadar upazila in the district of Mymensingh. Women in low, medium and high categories contributed 20,875 Tk, 28,600 Tk and 38,000 Tk of total household income. The results of the study showed that the average annual income of low, medium and high summer vegetable households was Tk. 12440, Tk 21568 and Tk. 33980 which were 26.21, 24.39 and 27.18 percent respectively. In summer vegetable production, women’s participation was 16.19, 12.44 and 12.53 percent for these three income households, whereas men’s participation was 10.03, 11.95 and 14.66 percent severally. The participation of women in low, medium income households was greater than the participation of men in the production of summer vegetables. It is quite noticeable that improved participation in summer vegetable production activities contributed to manage financial gain and established their quality.

S. Khandoker et al. (2016) conducted a study on “Profitability and resource use efficiency of winter vegetable production in selected areas of Bangladesh”. He conducted his study in three vegetables growing district namely Camilla, Jessore, Narshingdi during 2013-2014 to assess profitability, resource use efficiency, factors

affecting and problems of vegetables production. Depending on the area, production and market priority three winter vegetables such as radish, beans and brinjal were selected for the study. Total cost of production of reddish, brinjal, bean per hectare Tk. 130267, Tk. 208101, Tk. 167757 respectively. Per hectare average yield of these three vegetables 31.30 tons, 29.84 tons, and 16.96 tons respectively. Net return of reddish, brinjal and bean were Tk. 63944, Tk. 179780 and Tk. 69683. Benefit cost ratio on full cost basis for reddish, brinjal and bean were 1.50, 1.86 and 1.42 respectively. He shows that among three winter vegetables the production of brinjal required the highest cost and received highest net returns as well as the highest benefit cost ratios.

Akter et al. (2016) conducted a study on “Financial analysis of winter vegetables production in a selected area of Brahmanbaria district in Bangladesh”. In this study for financial profitability analysis selected winter vegetables namely tomato and cauliflower. The study conducted within two villages under Bancharampur upazila (Manikpur and Kallanpur) in Brahmanbaria district. The per hectare gross cost of production of cauliflower and tomato were Tk. 186702 and Tk. 199020 severally and the corresponding gross yield were Tk. 336000 and Tk. 376275 severally. The per hectare net yield of producing two winter vegetables were Tk. 149298 and Tk. 177255 severally. The study found that, the chosen winter vegetables were highly profitable to their farmers. However, the farmers gained the highest profit from tomato on basis of gross yield and net yield. The functional analysis indicates that per hectare gross yield were considerably influenced by the utilization of human labor, tillage, seeds, fertilizers, irrigation and pesticides. These factors were directly or jointly responsible for the influence on gross yield per hectare of cauliflower and tomato. From the results of this study, it can be concluded that there is a substantial scope that apparently exists within the study areas to extend the productivity of cauliflower and tomato in order to increase income, employment and nutritional status of the farmers.

Islam et al. (2018) stated that “Participation of rural women in activities related to homestead vegetable cultivation at Monirampur upazila under Jessore district”. The study was carried out in three unions of Nehalpur, Panchakori and Jhanpa de Jhanpa. Simple random sampling was used for collected data from 60 respondents. The study indicated that majority of rural women (age only) had a significant relationship with the participation of cultivation of homestead vegetables. Regarding half 48.3% of rural

women had a low to medium participation compared to 3.34% who had a high participation in vegetable cultivation. The participation of rural women was greater in preparation for sowing and improved planting, whereas it was absolutely weaker in the case of intercultural operation. The foremost dominant area of participation of rural women was seed collection, while it was weaker in the case of training. The study showed a significant positive relationship with their participation in homestead vegetables. Results indicate that women's participation in vegetable production remains unsatisfactory and necessary measures need to be taken for ensuring participation of rural women in vegetable farming.

Ferdousy et al. (2018) stated on “Rural women's participation in boosting homestead vegetable cultivation in Moulvibazar district”. The objective of the research was to determine the degree of participation of rural women in the cultivation of homestead vegetables in two villages, particularly Esubpur and Naogaon from the Bhunobir union of Sreemangal upazila in the district of Moulivibazar. By using pre-tested interview schedule and using simple random sampling method data were collected from 100 rural women. The results discovered that 75% of the respondents had an average participation in the cultivation of vegetables against 21% of low participation and 4% of high participation. Participation in irrigation and drainage among all other activities necessary for gardening that might have an impact on stimulating the cultivation of vegetables. Socio-economic characteristics of rural women such as level of education, size of farm, annual family income, knowledge, training experience were connected positively but age had a significant negative relationship with the participation of rural women in vegetable cultivation. Moulivibazar district where vegetable scarce there need based training program which depends on socio economic diversity of rural women will facilitate in boosting vegetable cultivation and rural women can find home gardening as the main income generating activity.

Chetia et al. (2018) studied on the “Involvement of rural women in farm and non-farm activities”. The study was conducted in eight villages of Jorhat subdivision and Titabor subdivision of Jorhat district of Assam. Data were collected from 120 respondents by face to face interview schedule. Statistical techniques and coefficient of correlation were used to analyze the data. The study showed that in today's society, the role of women extends beyond the home and raising children. Women must play the dual role

of housewife and wage earner. Rural women play a vital role in agricultural and non-agricultural activity. The results discovered that one hundred percent of rural women actually concerned in agricultural activities such as transplanting, harvesting and raising livestock followed by weeding (84.83%) care and maintenance of livestock (77.50%), cleaning of cattle shed (71.66%), cleaning of poultry shed (51.66%), care and maintenance of poultry (50.00%), marketing of agricultural products (35.00%), grain storage (19.16%) and 0.83% nursery and non-agricultural activities like sweet and snack preparation (94.16%), weaving (60.00%), pickle making (55.00%) and marketing of non-farm produce (14.16%) respectively. In this present study the contribution of women is greater in selected agricultural and non-agricultural activity.

2.2 Concluding Remarks:

It may be concluded from the above discussion that there are large number of studies conducted on vegetables production but a little research conducted on women participation in homestead vegetable production. This study was conducted by using latest data to get recent information regarding profitability of homestead vegetables production as well as factors affecting production on homestead vegetables in some selected areas of Patuakhali district. There was not any related research conducted before in the selected locations. It is expected to bring into focus important information regarding vegetable production in Patuakhali district which will help the policy makers for understanding the current situation and take initiatives to increase participation of women in homestead vegetable production.

CHAPTER 3
METHODOLOGY

CHAPTER 3

METHODOLOGY

3.1 Introduction

Methods and procedures are the key factors in collecting and analysis of data in any scientific research. The reliability of a scientific investigation depends largely on the appropriate methodology used in the investigation. Improper methodology very often leads to misleading results. An investigator must be careful in formulating methods and procedures when conducting research. The method of data collection depends on the nature, purpose and objectives of the study.

The field survey method was used in the study for data collection. The survey method was used mainly for two reasons:

- 1) Survey allows rapid investigations of large number of cases and
- 2) Its results have broader applicability

This chapter describes the methodology- selection of study areas, selection of sample and sampling technique, sources of data, processing of data and analytical techniques.

3.2 Selection of The Study Area

Selection of the study area is an important step in study of the area in which the agricultural survey will be conducted. Depending on the particularity of the objectives of the study survey shapes accordingly. Keeping this in mind, the present study was conducted in three unions namely Sreerampur, Angaria and Lebukhali under Dumki upazila of Patuakhali district. Dumki upazila was purposively selected because it is one of the vegetable scarce areas of the Patuakhali district.

The Main Criteria's Behind the Selection

- No study of this type was undertaken previously in those areas.
- Those unions were purposively selected because several NGOs were working on community development activities especially on income generating activities and homestead vegetable gardening is amongst the most trained activity.
- Rural women in those three unions are largely engaged in homestead vegetable production throughout the year to meet nutritional requirements and improve socio-economic/livelihood status.
- Easy accessibility and good communication facilities.
- Cooperation from the respondents was expected to be high and opportunity to obtain reliable information

3.3 Location

Patuakhali district was established in 1969. It is a district in South-central Bangladesh in the Barisal division. Patuakhali district, the area is 3220.15 sq. km, located between 21°48' and 22°36' north latitudes and between 90°08' and 90°41' east longitudes. It is bounded by Barisal district in the west.

The study areas are three unions namely Sreerampur, Angaria and Lebukhali under Dumki upazila of Patuakhali district. The area of Dumki upazila is 92.46 km². It limits to the north with Bakerganj upazila of Barisal zila, east by Bauphal upazila and South by Patuakhali sadar upazila and west by Mirzaganj upazila.



Figure 3.1: A Map of Patuakhali District Showing The Study Areas

Source: <https://www.thebangladesh.net/barisal-division/patuakhali-district/dumki-upazila-patuakhali.html>

3.4 Selection of Sample and Sampling Technique

Sampling technique is an important part of survey and Research. To select the sample for a study, two factors must be considered when selecting samples. The sample size must be large enough to allow adequate degrees of freedom in statistical analysis. On the other hand, the administration of field research, processing and analysis of data should be manageable within the limitations imposed by physical, human and financial resources. The list of rural women who were involved in production of homestead vegetable was prepared through a short preliminary survey with the help of NGO named Lutheran Health Care Bangladesh (LHCB)- an international NGO working in that with rural over 25 years in my study area. After which they were selected by using random number table. Considering all these aspects, A total of 90 rural women had been selected purposively from the three unions namely Angaria, Sreerampur and Lebukhali. Each union represents 30 respondents for this study. Data were collected by the researcher herself using a prepared interview schedule. Face to face interview was conducted to collect information from the respondents.

Study Design and Sample Distribution of Rural Women in The Study Areas:

Upazila	Union	Women participants
Dumki	Angaria	30
	Sreerampur	30
	Lebukhali	30
Total		90

3.5 Preparation of Interview Schedule

Preparation of survey schedules is a crucial importance part in this study as the success of the research and survey depends on the proper designing of the interview schedule. Considering, the objectives of the study a set of interview schedule was carefully prepared to collect the required information from the respondents within the shortest possible time. The draft survey schedule was previously tested by interviewing some rural women. During the interview, each respondent was received a brief introduction about the nature and purpose of the study. Then the questions were asked systematically. Before finalizing, some of the elements of the draft interview schedule were improved, rearranged, and modified. After making the necessary adjustments, a final survey

schedule was developed in logical sequences so that the respondents could respond systematically. To obtain accurate information, the schedule was also prepared in a simple manner.

The final schedule designed to collect the following:

- Socioeconomic- condition of the respondents
- Yield, output, cost and return of homestead vegetables production
- Constraints faced by women
- Their feasible solutions were collected through the interview schedule.

3.6 Data Collection Period

Both Primary and secondary data were collected for the study. As selected rural women cultivated vegetables all the year round in homestead so primary data for this study was collected through personal interview by the researcher herself during 15 August 2019 to 30 September 2019. In order to obtain reliable data a number of field visits were made by the researcher herself during the period. Secondary data were collected from various research documents and papers like-

- Statistical Yearbook of Bangladesh
- Yearbook of Agricultural Statistics
- Bangladesh Economic Review
- The national and international journals, publications and
- Internet

3.7 Method of Data Collection

Collecting accurate and reliable field data is not an easy task. The result of any study depends on the precision and reliability of the data. Reliability of the data depends mainly on the method of data collection. The relevant data were collected by visiting each village personally and interviewing them with the help of a previously tested interview schedule. In general, most respondent do not keep records of their activities.

Therefore, it is very difficult to collect real data and the researcher has to rely on the respondent's memory. Interviews were normally conducted in respondent's houses and markets in their leisure time. Before conducting a real interview, a brief introduction to the aims and objectives of the study were explained to each respondent.

Initially, the respondent's hesitated to answer the question but when assured that the study was purely academic and would not adversely affect them then they cooperated with the researcher. At the time of the interview, the researcher systematically asked questions. If the questions seemed difficult to answers then the questions were explained in detail to help them answer and the answers were recorded accordingly. Respondents were requested to provide the correct information to extent possible. At the end of each interview, the interview schedule was carefully checked to ensure that the information for each of the items had been recorded correctly.

3.8 Processing, Editing and Tabulation of Data

After the phase of data collection, the completed schedules were manually coded and edited for analysis to achieving the objectives of the study. All the collected data was carefully summarized and analyzed to eliminate all possible errors and data was processed and edited. For data entry and data analysis, the Microsoft Excel and SPSS programs were used. It can be seen that the information was initially collected in local units to minimize errors and after verifying the collected data, it was converted into standard international units. Finally, some relevant tables were prepared according to the need for analysis and results were obtained by using various statistical techniques.

3.9 Descriptive Statistics

3.9.1 Tabular Technique

In this analysis A well-known tabular technique is used. The method generally used to discover variations between variables. This technique is generally used to obtain socioeconomic profile of the respondent such as age, occupation, income, etc. With the help of some statistical measure like sum, average, percentage etc. Per hectare gross return, gross margin, and net return of selected homestead vegetable (Papaya, Brinjal,

Bean, and Cucumber) were calculated in tabular form. In the study data were presented mainly in tabular form due to its simple and convenient characteristics.

3.10 Statistical Technique

3.10.1 Profitability Analysis

Costs and return analysis are the most common method to determine the profitability of homestead vegetables. In the present study, four variables were considered, such as cost of human labor, cost of seed, cost of chemical fertilizers, cost of manure etc. for profitability analysis as well as Cobb-Douglas production function. The following profit equation was used to evaluate the profitability of homestead (Papaya, Brinjal, Bean, and Cucumber) vegetables production.

$$\text{Profit}(\pi) = \sum_{i=1}^n (P_{yi} \cdot Y_i) - \sum_{i=1}^n (P_{xi} \cdot X_i) - \text{TFC}$$

Where,

π	=	Net Return
P_{yi}	=	Price per unit of the i^{th} produce
Y_i	=	Quantity of the i^{th}
P_{xi}	=	Price per unit of the i^{th} inputs
X_i	=	Quantity of the i^{th} inputs
TFC	=	Total Fixed Cost

3.10.2 Functional Analysis

To learn more about the relationship between output and input, Cobb-Douglas production function was used. Cobb - Douglas production function model was chosen to estimate the effects of key variables on production processes of homestead vegetable production. In this study six independent variables were hypothesized to explain the production of homestead vegetable and yield per hectare was considered as the dependent variable.

The specification of the Cobb-Douglas production function model was as follows:

$$Y = aX_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} X_5^{b_5} X_6^{b_6} e^{ui} \dots\dots\dots (1)$$

By taking log in both sides the Cobb-Douglas production function was transformed into the following logarithmic form because it could be solved by the ordinary least square (OLS) method.

The empirical production function was the following:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + ui$$

Where, (2)

- Y** = **Gross return**
- X₁** = **Human labor cost (Tk./ha)**
- X₂** = **Seed cost (Tk./ha)**
- X₃** = **Urea cost (Tk./ha)**
- X₄** = **TSP cost (Tk./ha)**
- X₅** = **MOP cost (Tk./ha)**
- X₆** = **Manure cost (Tk./ha)**
- a** = **Intercept**
- b₁, b₂, b₃, b₄, b₅, b₆** = **Coefficients of the respective input**
- ui** = **Error term**

3.11 Procedure of Estimating Indicators

3.11.1 Cost of Human Labor

One of the most important input used in the process of homestead vegetables production was Human Labor. There are two types of human labor such as family and hired labor. Family labor consists of the farm operator herself and other family members. Human labor for homestead vegetable production included total man-days spend on various operation for producing homestead vegetables (Papaya, Brinjal, Bean, Cucumber) such as land preparation, sowing of seed, application of manure, fertilizer, weeding, lift, carrying and others etc. the opportunity cost concept was used to determine the cost of family labor. In this study area, opportunity cost of family labor was assumed to be the market wage rate that selected rural women actually paid to hired labor. In these study areas, human labor was measured in terms of man-days and eight hours of work was equivalent to one man-day.

3.11.2 Cost of Seed

In the study areas, majority of rural women used purchased seed for homestead vegetable production. Some of the rural women also used home supplied seed as well. Cost of seed varied depending on its quality and availability. The cost of purchased seed was calculated based on actual price paid by the rural women. The cost of home supplied seed was estimated at the prevailing market price.

3.11.3 Cost of Chemical Fertilizer

In the selected study areas, rural women used different kinds of chemical fertilizers for higher growth. They normally used Urea, Triple Super Phosphate (TSP) and Muriate of Potash (MOP) And Diammonium Phosphate (DAP) etc. Costs of these fertilizers were estimated according to the price paid by rural women for their purchases.

3.11.4 Cost of Manure

For higher production of homestead vegetables majority of rural women used manures like cow dung, some of rural women also used Excreta of chickens, Ash, Compost as a manure. They used these kinds of manure for higher yield. Manure may be used from home supplied or through purchased. The value of home supplied and purchased manure was calculated at the prevailing market price.

3.11.5 Interest on Operating Capital

The amount of money needed to meet the expenses on hired or purchased inputs was treated as operating capital. Interest on Operating capital was determined on the basis of opportunity cost principles. It was calculated by taking all the cost incurred throughout the production period (from land preparation to harvesting) at the rate of six percent for three months. Interest on Operating Capital (IOC) was calculated by using the following formula:

$$\text{IOC} = \frac{\text{OC} \times \text{IR} \times \text{Time Consideration}}{2} \dots\dots\dots (3)$$

Where,

OC = Operating Capital

IR = Interest rate

3.11.6 Cost of Land Use

Land use cost was calculated on the basis of opportunity cost of the use of land per hectare for the cropping period of three months. So, cash rental value of land has been used for cost of land use.

3.12 Calculation of Returns

3.12.1 Gross Return

Gross return (per hectare) was calculated by multiplying the total amount of product and by-product by their respective per unit prices.

$$\text{Gross Return} = (\text{Quantity of the product} \times \text{Average price of the product}) \\ + \text{Value of by product}$$

3.12.2 Gross Margin

Gross margin can be defined as the difference between gross return and variable costs. Generally gross margin was computed on total variable cost (TVC) basis. Per hectare gross margin was obtained by deducting variable cost from gross return. That is,

$$\text{Gross Margin} = \text{Gross Return} - \text{Variable Cost}$$

3.12.3 Net Return

Net Return or profit was computed by subtracting the total production cost from the total return or gross return. That is,

$$\text{Net Return} = \text{Total Return} - \text{Total Production cost}$$

3.12.4 Undiscounted Benefit Cost Ratio (BCR)

BCR is used to compare benefit per unit of cost. Average return to each taka spent on production is an important aspect to measure the profitability. The BCR (undiscounted) is the ratio of gross return to total cost. It helps to analyze the financial efficiency of the farms. The BCR (undiscounted) was computed by using following formula:

$$\text{BCR} = \frac{\text{Gross Return}}{\text{Total Cost}}$$

CHAPTER 4

SOCIOECONOMIC CHARACTERISTICS OF SELECTED RURAL WOMEN

CHAPTER 4

SOCIOECONOMIC CHARACTERISTICS OF SELECTED RURAL WOMEN

4.1 Introduction

This chapter provides a brief description of the socio-economic characteristics of selected rural women in the study area. To get a complete and accurate scenario of vegetable producing rural women of a selected area, it is required to describe some of the basic socio-economic characteristics of the selected rural women of the study area because people differ from one to another in many respects. The socioeconomic ten characteristics considered in the present study. They are given below:

4.2 Marital Status of The Selected Rural Women

It is evident from the table that about half of the rural women were married. The Table 4.1 indicates that-

Table 4.1: Marital Status of The Selected Respondents in The Study Area

Marital Status	Percentage of Respondents			
	Angaria	Sreerampur	Lebukhali	Average
Married	63.33	90	63.33	72.22
Unmarried	33.33	10	36.67	26.67
Widower	3.33	0	0	1.11

Source: Field Survey, 2019

In Angaria union about 63.33 percent rural women were married about 33.33 percent were unmarried and only 3.33 percent were widower. In Sreerampur union about 90 percent were married and 10 percent rural women were unmarried. On the other hand, In Lebukhali union about 63.33 percent was married and 36.67 rural women were unmarried (Table 4.1). However, most of the rural women of Angaria, Sreerampur and Lebukhali union was married.

4.3 Age Distribution of The Selected Rural Women

Age distribution of the Rural Women according to various age groups is an important factor in maintaining profitable operation of homestead vegetable production. Age of homestead Rural Women have an influence on the production and in the better management of the production system. The selected rural women were grouped into four categories according their age. Such as below 31 years, 31- 45 years, 46- 50 years and above 50. The different age groups of the rural women from three unions, e.g. Angaria, Sreerampur and Lebukhali union are given in Table 4.2. The age of the selected rural women was observed to be ranging from minimum of 18 to a maximum of 60 years.

Table 4.2: Age Distribution of The Selected Respondents in The Study Area

Age	Percentage of Respondents			
	Angaria	Sreerampur	Lebukhali	Average
> 31 years	33.33	30	43.33	35.56
31- 45 years	53.33	50	43.33	48.89
46 - 55 years	10	16.67	10	12.22
Above 55 years	3.33	3.33	3.33	3.33

Source: Field Survey, 2019

It is revealed form the Table 4.2 that the highest number of rural women (53.33 percent) came from age group 31-45 years. In Sreerampur union, it can be seen the highest number of rural women (50 percent) came from age group 31-45 years and in Lebukhali union the highest number of rural women (43.33percent) came from age group both below 31 years and 31-45 years. The findings imply that majority of the selected rural women (48.89%) in the most active age group 31-45 years which referred as young aged category. These young aged rural women had great potentials to uplift their livelihood status and if they properly trained, motivated, guided they provided more physical effort in producing homestead vegetable production.

4.4 Farming Experience of The Selected Rural Women

Farming experience of the selected rural women was defined on the basis of her involvement in farming activity. Low experience was assigned up to 9 years of farming activities, middle experience was assigned 10-22 years of farming activities and high experience was assigned above 20 years of farming activities.

In the case of farming experience in Angaria union low, medium and high experience rural women accounted for 20.00 percent, 73.33 percent and 6.67 percent, In Sreerampur union low, medium and high experience rural women accounted for 56.67 percent, 40.00 percent and 3.33 percent, In Lebukhali union low, medium rural women accounted for 60 percent, 40 percent. No rural women were found aged group >20 years. From table 4.3 it shows that, in my study area most of the selected rural women (51.11%) had (10-20) years farming experience on an average

Table 4.3: Farming Experience of The Selected Respondents in The Study Area

Categories	Percentage of Respondents			
	Angaria	Sreerampur	Lebukhali	Average
Up to 9 years	20.00	56.67	60.00	45.56
(10 - 20) years	73.33	40.00	40.00	51.11
> 20 years	6.67	3.33	0.00	3.33

Source: Field Survey, 2019

4.5 Family Size of The Selected Rural Women

In the study area family has been considered as one which has a total number of people living together with the same head of the family. Family member includes wife, son, unmarried daughter, father, mother and brother. The permanent hired labor was not included as a member of the family. The total number of persons of all families was divided into three age categories according to their family size.

Table 4.4: Family Size of The Selected Respondents in The Study Area

Categories	Percentage of Respondents			
	Angaria	Sreerampur	Lebukhali	Average
Small (1 - 5)	90.00	93.33	90.00	91.11
Medium (6 - 7)	10.00	6.67	3.33	6.67
Large (above 7)	0.00	0.00	6.67	2.22

Source: Field Survey, 2019

The different family size of rural women is presented in Table 4.4. Table 4.4 indicates that in my study area Dumki family category small is highest 91.11 percent followed by medium 6.67 percent and low 2.22 percent. Unions wise in Angaria small 90 percent, medium 10 percent, large 0 percent and in Sreerampur union small 93.33 percent, medium 6.67 percent and high categories 0 percent. In Lebukhali union small, medium and high categories rural women accounted for 90.00 percent, 3.33 percent and 6.67 percent respectively. Table shows that Angaria, Sreerampur and Lebukhali union mainly assigned small family which consisted (1-5) members.

4.6 Educational Level of The Selected Rural Women

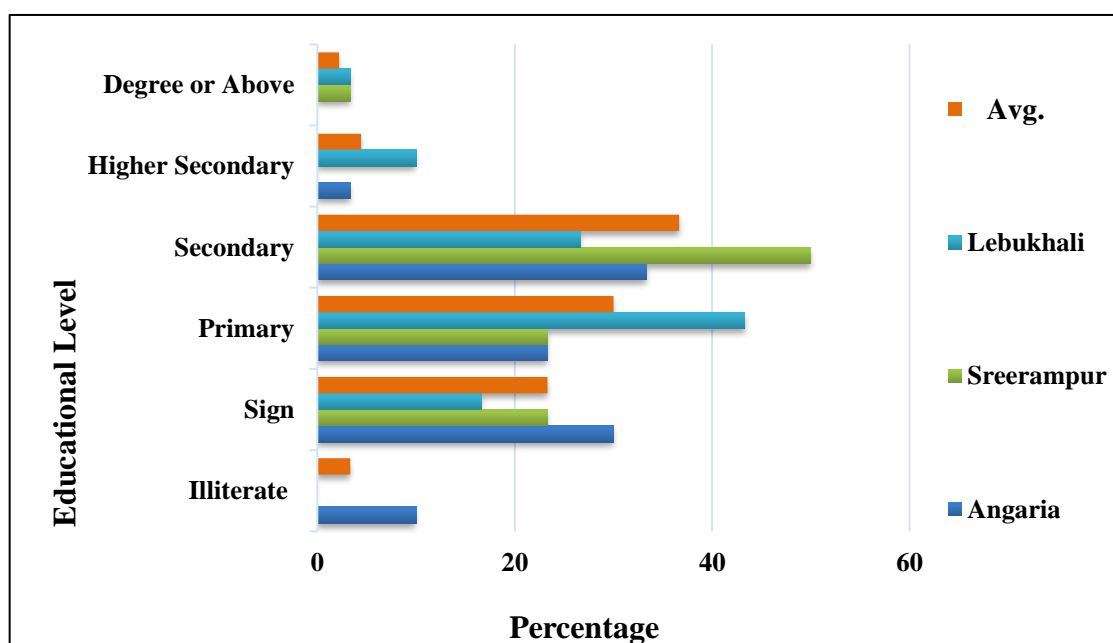


Figure 4.1: Educational Level of The Rural Women in The Study Area

Source: Field Survey, 2019

Education may be defined as the ability of an individual to read and write or formal literacy received up to a certain standard. Education is generally regarded as a basic need of the social improvement of a community. It is the most important determinants of rural women’s participation in homestead vegetable production.

From the above figure 4.1 we saw, in Angaria union, illiterate respondent was 10 percent, about 30 percent were found who can only sign, about 23.33 percent were found to have primary level education, about 33.33 percent were found to have secondary, about 3.33 percent were found to have higher secondary level education.

In Sreerampur union, about 23.33 percent were found who can only sign and who have primary level education, about 50 percent were found to have secondary education, about 3.33 percent were found to have degree or higher level education in Lebukhali union, about 16.67 percent were found who can only sign, about 43.33 percent were found to have primary level education, about 26.67 percent were found to have secondary level education, about 10 percent were found to have higher secondary level education and , about 3.33 percent were found to have degree or higher secondary level education

4.7 Sources of Vegetables Seed Used by The Selected Respondent

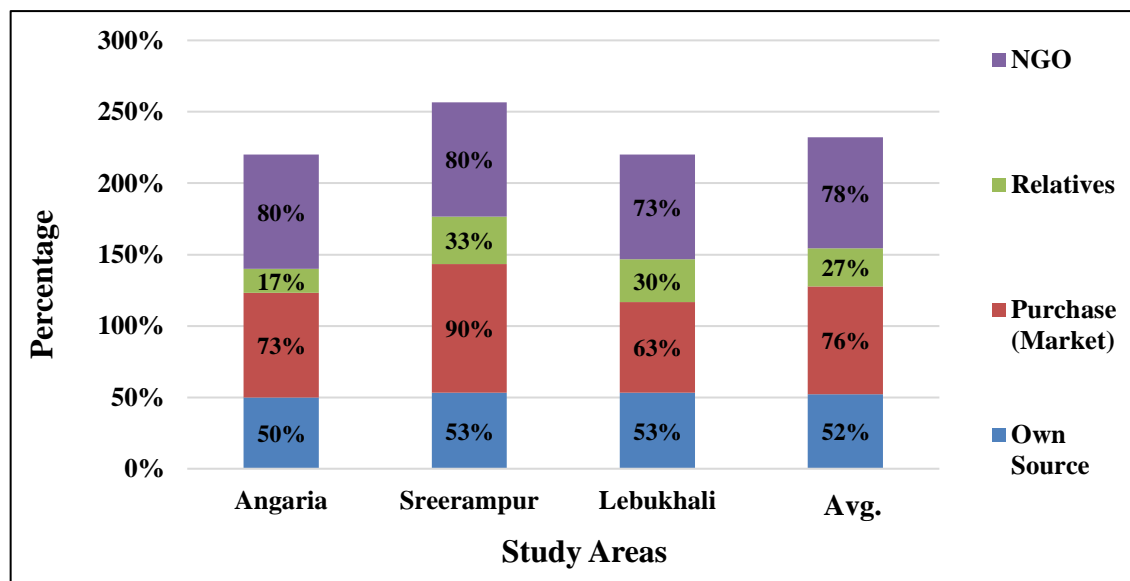


Figure 4.2: Sources of Vegetables Seed

Source: Field Survey, 2019

Seed is an important input for growing crops or vegetables. Good quality of seed can ensure good production. It is thought per acreage production of vegetables is low in Bangladesh due to low quality of vegetables seeds. Majority of the rural women in the study area used seed for vegetables production that they get seed free from different NGO.

Figure 4.2 shows that in Angaria union rural women get about 35.82 percent seed free from NGO and the rest 23.88 percent, 32.84 percent, 7.46 percent seeds were used from their own source, purchase from market and relatives. In Sreerampur union, majority of rural women purchase about 35.06 percent seed from market and 31.17 percent seed used that they get from NGO and rest 20.78 percent, 12.99 percent seed used from their own source, relatives and in Lebukhali union rural women get about 33.33 percent seed free from NGO and rest 28.79 percent, 24.44 percent, 13.64 percent seed used from their own source, purchase from market, relatives.

4.8 Training Facilities of Sample Respondents

Training facilities can enhance the production capacity and efficiency of selected Rural Women for growing more vegetables. Figure 4.3 shows that in Angria, Sreerampur and Lebukhali union 86.67 percent, 86.67 percent and 76.67 percent rural women received training on homestead vegetable production while 13.33 percent, 13.33 percent and

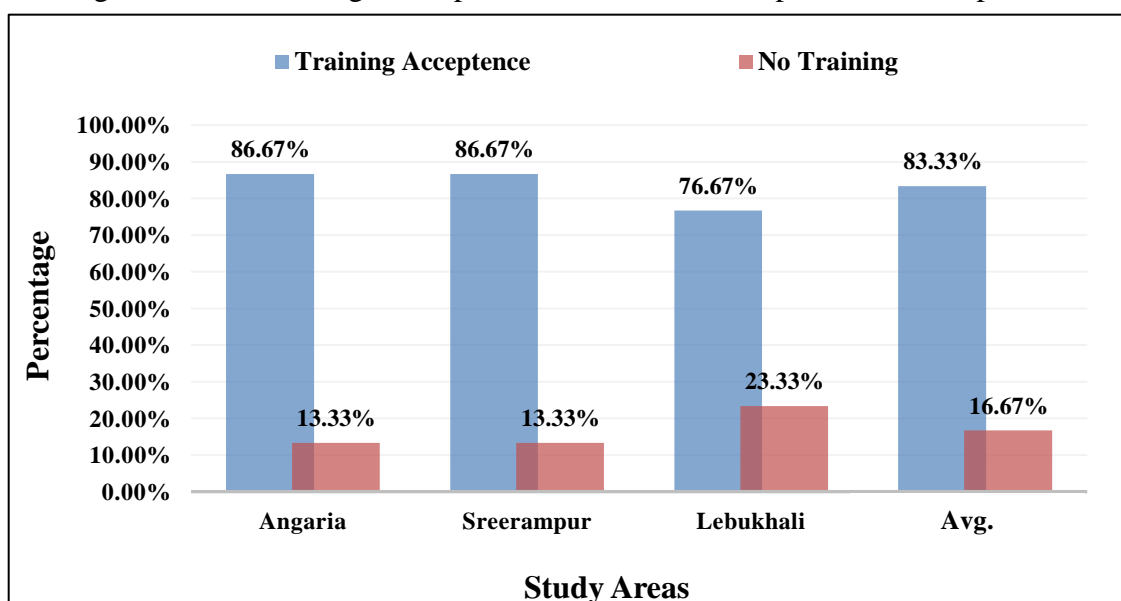


Figure 4.3: Training Facilities of Selected Respondents

Source: Field Survey, 2019

23.33 percent of them had not. Training has improved their perceptions of good seed use, use of fertilizer and manure in an appropriate manner, pest management and so on.

4.8.1 Name of Training Institution

The name of different training Institutions that homestead Rural Women get the training facility; such as- Lutheran Health Care Bangladesh (LHCB), Youth Development Office, Ektee Bari Ektee Khamar, Polliseba, Upazila Agricultural Office and BRAC etc. Name of training institution shown in Figure 4.4

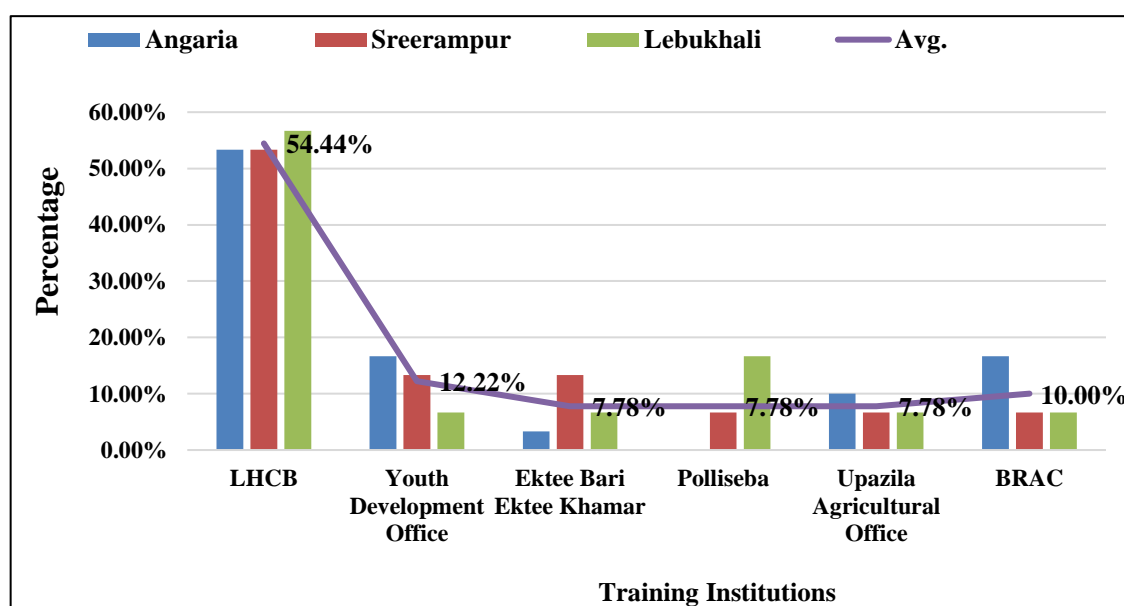


Figure 4.4: Name of Training Institution

Source: Field Survey, 2019

In Angaria, Sreerampur and Lebukhali union majority of rural women about 51.28 percent, 57.14 percent and 51.22 percent were taken training facility from NGO named LHCB and in Angaria union rest 10.26 percent, 5.13 percent, 5.13 percent, 2.56 percent, 15.38 percent got training facility from Youth Development Office, Ektee Bari Ektee Khamar, Polliseba, Upazila Agricultural Office and BRAC. In Sreerampur union rest of rural women about 4.76 percent both from Youth Development Office and Polliseba, and 7.14 percent both from Ektee Bari Ektee Khamar and Upazila Agricultural Office and 9.52 percent from BRAC were taken training facility .In Lebukhali union rest of rural women about 9.76 percent, 2.44 percent, 4.88 percent were taken training facility

from Youth Development Office, Ektee Bari Ektee Khamar, Polliseba and also 7.32 percent were taken training facility both from Upazila Agricultural Office and BRAC.

It appears that training program on homestead vegetable production seemed to be most appropriate for women's participation in the agricultural income generating activities.

4.9 Level of Income of The Sample Respondents

Annual income refers to the total earning by the respondent and their family members in a year through Agriculture and Non-Agricultural sources, such as- farming, business, job or other service works. It was expressed in taka.

Table 4.5: Level of Income of The Selected Respondents in The Study Area

Categories	Angaria (%)	Sreerampur (%)	Lebukhali (%)	Average (%)
Crops	3.43	6.28	6.98	5.57
Livestock Rearing	0.25	0.46	0.51	0.41
Fisheries	0.32	0.59	0.66	0.52
Fruit Sapling	0.10	0.18	0.20	0.16
Vegetables	2.04	3.73	4.14	3.30
Business	26.18	24.73	24.37	25.09
Service	16.12	15.22	15.01	15.45
Day Labor	42.13	39.80	39.23	40.39
Others Family Members	9.33	8.81	8.68	8.94
Other	0.11	0.20	0.22	0.17

Source: Field Survey,2019

From the Table 4.5 in Angaria union, about 3.43 percent, 0.25 percent, 0.32 percent, 0.10 percent, 2.04 percent, 26.18 percent, 16.12 percent, 42.13 percent, 9.33 percent and 0.11 percent income come from crop, livestock rearing, fisheries, fruit sapling, vegetables, business, service, day labor, other family members and from other sources.

In Sreerampur union, about 6.28 percent, 0.46 percent, 0.59 percent, 0.18 percent, 3.73 percent, 24.73 percent, 15.22 percent, 39.80 percent, 8.81 percent and 0.20 percent

income come from crop, livestock rearing, fisheries, fruit sapling, vegetables, business, service, day labor, other family members and from other sources.

In Lebukhali union, about 6.98 percent, 0.51 percent, 0.66 percent, 0.20 percent, 4.14 percent, 24.37 percent, 15.01 percent, 39.23 percent, 8.68 percent and 0.22 percent income come from crop, livestock rearing, fisheries, fruit sapling, vegetables, business, service, day labor, other family members and from other sources.

4.10 Annual Expenditure of The Selected Rural Women

Annual expenditure of the respondent is important socio-economic characteristics. The yearly expenditure of homestead vegetable grower also differs from one another. In the present study the expenditure of homestead rural women was categorized as follows: Food, Energy, Education, and Health care, Transportation, Clothing, Festivals, House Rent, Cell Phone expenses, Entertainment and others.

Table 4.6: Annual Expenditure of The Selected Respondents in The Study Area

Categories	Percentage of Respondents			
	Angaria	Sreerampur	Lebukhali	Average
Food	49.59	66.52	54.27	56.80
Energy	0.54	5.12	3.21	2.96
Health Care	6.24	7.70	8.33	7.42
Education	17.51	1.47	17.20	12.06
Transportation	4.53	2.42	2.74	3.23
Clothing	7.69	7.15	6.16	7.00
Festivals	6.79	3.24	3.30	4.44
House Rent	1.55	0.37	0	0.64
Mobile Expenses	3.43	4.88	3.85	4.05
Entertainment	1.16	1.13	0.94	1.07
Others	0.97	0	0	0.32

Source: Field Survey, 2019

In Angaria union table 4.6 shows that, annual expenditure of the respondent were 49.59 percent, 0.54 percent, 6.24 percent, 17.51 percent, 4.53 percent, 7.69 percent, 6.79 percent, 1.55 percent, 3.43 percent, 1.16 percent and 0.97 percent from Food, Energy, Education, Health care, Transportation, Clothing, Festivals, House Rent, Cell Phone expenses, Entertainment and others respectively.

In Sreerampur union, Annual expenditure of the respondent were 66.52 percent, 5.12 percent, 7.7 percent, 1.47 percent, 2.42 percent, 7.15 percent, 3.24 percent, 0.37 percent, 4.88 percent, and 1.13 percent from Food, Energy, Education, Health care, Transportation, Clothing, Festivals, House Rent, Cell Phone expenses, and Entertainment respectively.

In Lebukhali union, Annual expenditure of the respondent were 54.27 percent, 3.21 percent, 8.33 percent, 17.2 percent, 2.74 percent, 6.16 percent, 3.3 percent, 3.85 percent, 0.94 from Food, Energy, Education, Health care, Transportation, Clothing, Festivals, Cell Phone expenses, and Entertainment respectively.

4.11 Occupation Status of The Selected Respondent

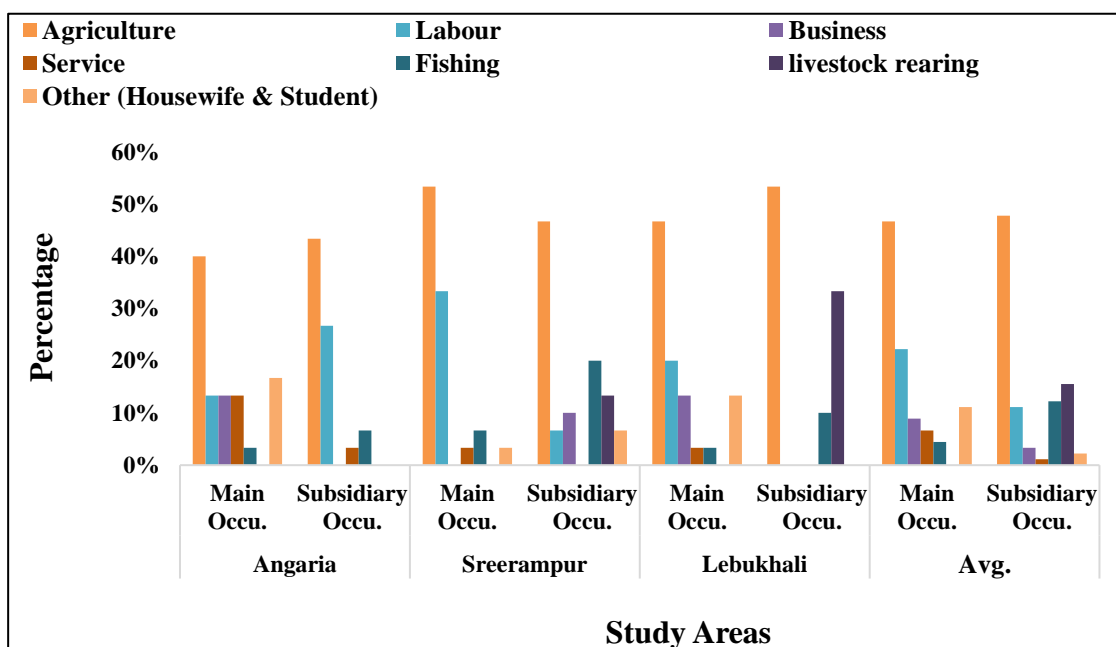


Figure 4.5: Occupational Status of The Respondents

Source: Field Survey, 2019

As Bangladesh is agro-based country, the majority of the people in the rural areas adopt agriculture as their prime profession. Rural women were engaged in various types of occupation. The main occupation of farm family considered in the present study was the occupation from which most of the income was earned. The occupations of rural women are presented in figure 4.5.

It appears that in Angaria union agriculture, labor, business, service, fishing, and other represented main occupation for 40 percent, 13.33 percent, 13.33 percent, 13.33 percent, 3.33 percent and 16.67 percent respectively of homestead Rural Women. On the other hand, 43.33 percent, 26.67 percent, 3.33 percent, 6.67 percent of rural women had agriculture, labor, service and fishing as their subsidiary occupation.

In Sreerampur union in case of main occupation agriculture is 53.33 percent, labor constituted 33.33 percent, service constituted 3.33 percent, fishing constituted 6.67 percent and other constituted 3.33 percent. In case of subsidiary occupation, agriculture is 46.67 percent, labor constituted 6.67 percent, business constituted 10 percent, fishing constituted 20 percent, livestock rearing constituted 13.33 percent and other constituted 6.67 percent.

In Lebukhali union, agriculture, labor, business, service, fishing, and other represented main occupation for 46.67 percent, 20 percent, 13.33 percent, 3.33 percent, and 3.33 percent and 13.33 percent respectively of homestead Rural Women. On the other hand, 53.33 percent, 10 percent and 33.33 percent of rural women had agriculture, fishing and livestock rearing as their subsidiary occupation.

4.12 Distribution of Average Homestead Area (ha) by The Sample Respondent

Homesteads include vegetables gardening, livestock rearing, poultry raising, fish culture, homestead forestry, post-harvest processing and alike activities. The actual area of homestead devoted to vegetable cultivation is very small. Hussain et al. (1988) reported that about 13% of the total homestead area was under vegetable production. Small farmers have some crop field. Usually they are to maintain their livelihood by utilizing the homestead and crop field. However, many small homestead areas of Bangladesh remain unutilized, which could be brought under round the year vegetable

cultivation for reducing problems. In the context of ever-increasing problems of malnutrition and smaller farm size for field crops production, the only feasible option for small households is to grow vegetables intensively in the homestead, which can provide household food security and nutrition for those farmers.

Table 4.7: Distribution of Average Homestead Area (ha) Per Farm by The Sample Respondent

Distribution Pattern	Angaria (ha)	Sreerampur (ha)	Lebukhali (ha)	Average (ha)
Vegetables growing area	0.0090	0.0112	0.0186	0.013
Area occupied by cowshed, pond, open yard and others	0.0280	0.0517	0.0309	0.037
Unutilized area	0.0005	0.0048	0.0049	0.003
Total Distribution of Homestead Area (HA) in the study areas	0.0375	0.0677	0.0544	0.053

Source: Field Survey, 2019

In Angaria union, average homestead area was 0.0375 ha out of which, area used for vegetable production 0.0090 ha, 0.0280 ha occupied by cowshed, pond, open yard and 0.0005 ha remained unutilized.

Similarly, In Sreerampur and Lebukhali union, average homestead area was 0.0677 and 0.0544 ha respectively out of which, area used for vegetable production 0.0112 and 0.0186 ha; 0.0517 and 0.0309 ha occupied by cowshed, pond, open yard; and 0.0048 and 0.0049 ha remained unutilized respectively.

It's being clearly observed from the above Table 4.7 that almost same quantity of area remains unutilized in the three unions.

4.13 Vegetables Grown in Homestead by Selected Rural Women

In the study area selected rural women cultivated different kinds of vegetables. Most common vegetables were categorized into three groups as (i) Open field vegetables, (ii) Cucurbits and leguminous vegetables and (iii) Under storied vegetables. The open field vegetables were grown in the open sunny field of the homestead as like radish, cabbage, papaya, cucumber, Indian spinach, lady's finger, brinjal, tomato and stem amaranth

while cucurbits and leguminous vegetables were bitter gourd, bottle gourd, sweet gourd and country bean which grown in trailers and fence. Elephant foot yam and leafy aroid were under storied vegetables which grown in the shady places of the homestead.

Four open field vegetables papaya, brinjal, cucumber and bean has been chosen to study as those vegetables were most common to cultivate in every households in the selected three unions Angaria, Lebukhali and Sreerampur and they grow year-round. Selected rural women follow the same production procedures, planting time and fertilizers for all the four vegetables. As a result, the cost varies very little from household to household and since they take collective measures for all the vegetables during interview the respondent failed to give the vegetable wise production information and that's being the culture in the study area. So, women participation and profitability has been measured on average rather on individual terms to chunk out the clear status.

In the study areas papaya production has been maximum in all the three unions respectively 41, 33, 37 percent. Second highest produced vegetable was brinjal 23, 30, 26 percent respectively; cucumber being the third highest growing respectively 18, 22, 22 percent and bean being the lowest produced amongst the four vegetables 18, 15, 15 percent respectively (Table 4.8).

Table 4.8: Vegetables Grown by Selected Rural Women in Study Area

Areas	Percentage of Respondents			
	Papaya	Brinjal	Bean	Cucumber
Angaria	41	23	18	18
Sreerampur	33	30	15	22
Lebukhali	37	26	15	22
Average	37	26.33	16	20.66

Source: Field Survey, 2019

4.14 Management Practices of Homestead of The Selected Respondents

The selected respondent of the study area did not lake proper management to their homestead vegetables production even they did not fence their vegetables because many of them grow vegetables in scattered plants around way the homestead instead of in a single, compact plot. Most of the rural women irrigated their vegetables in the morning time as and when necessary. Selected respondent in the study area applied manure than

fertilizer. Many of them were not interested to apply fertilizer to the vegetables due to small number of crops. Most of the selected rural women used ash as a measure of pest control instead of pesticides.

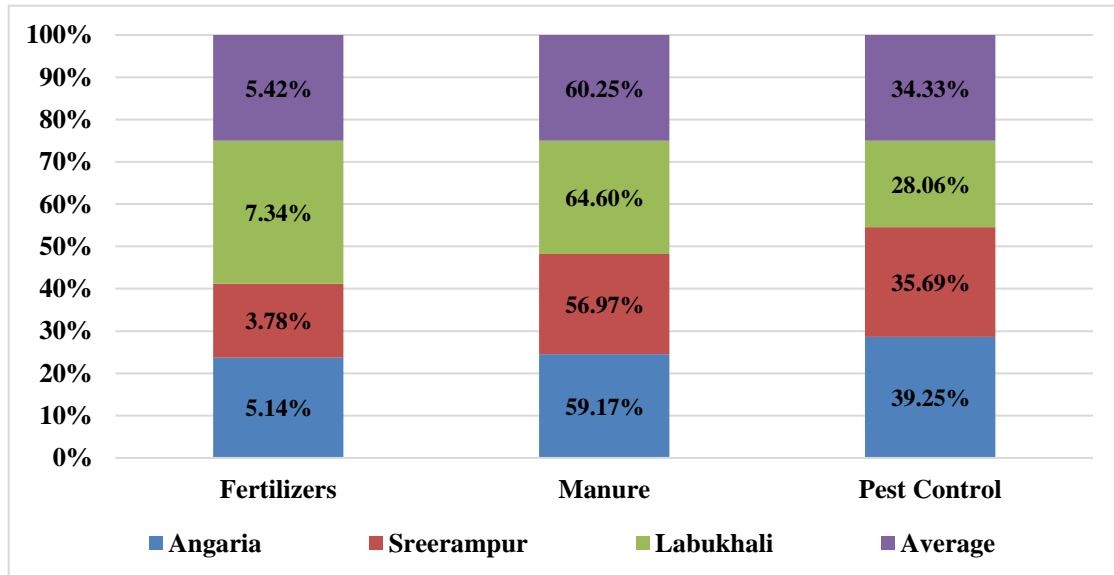


Figure 4.6: Management Practices of Homestead

Source: Field Survey, 2019

From the above figure 4.6, it's clear that using of manures is highest in Lebukhali union 64.60 percent, 56.97 percent in Angaria and 56.97 percent in Sreerampur union. Salinity water of the study area could be one reason of high percentage use of manure and tidal flood plain area, variation on rainfall patterns and fluctuating temperature affect production other behind reasons. In all the three unions farmers usual use cow dung as fertilizer but the percentage is very low 7.34, 3.78 and 5.14 percent respectively in Lebukhali, Sreerampur and Angaria.

4.15 Labor Use Pattern of Homestead Vegetables Production Activities

Labor use pattern of women in homestead vegetables production activities was the highest followed by husband and others (children, parents and father or mother in law) (Table4.9). As found in the study male members in family mainly involved with land preparation 48.48 percent in Angaria, 40.23 percent in Sreerampur and 28.42 percent in Lebukhali union. Except main land preparation women being the dominating factor.

Table 4.9: Labor Utilization Pattern of Vegetable Production Activates

Category	Angaria (%)		Sreerampur (%)		Lebukhali (%)		Average (%)	
	Male	Female	Male	Female	Male	Female	Male	Female
Plowing Soil	48.48	1.30	40.23	1.90	28.42	0.00	39.05	1.07
Seedling Sowing	13.64	16.23	22.99	19.05	18.95	20.56	18.52	18.61
Weeding	19.70	24.68	18.39	29.52	22.11	29.91	20.06	28.04
Manure, Fertilizer Application	15.15	38.96	16.09	22.86	17.89	24.30	16.38	28.71
Lift, Carrying and Others	3.03	18.83	2.30	26.67	12.63	25.23	5.99	23.58

Source: Field survey, 2019

4.16 Decision Making and Work Responsibility of Selected Respondents

In our country culturally, women are under-represented in decision-making positions.

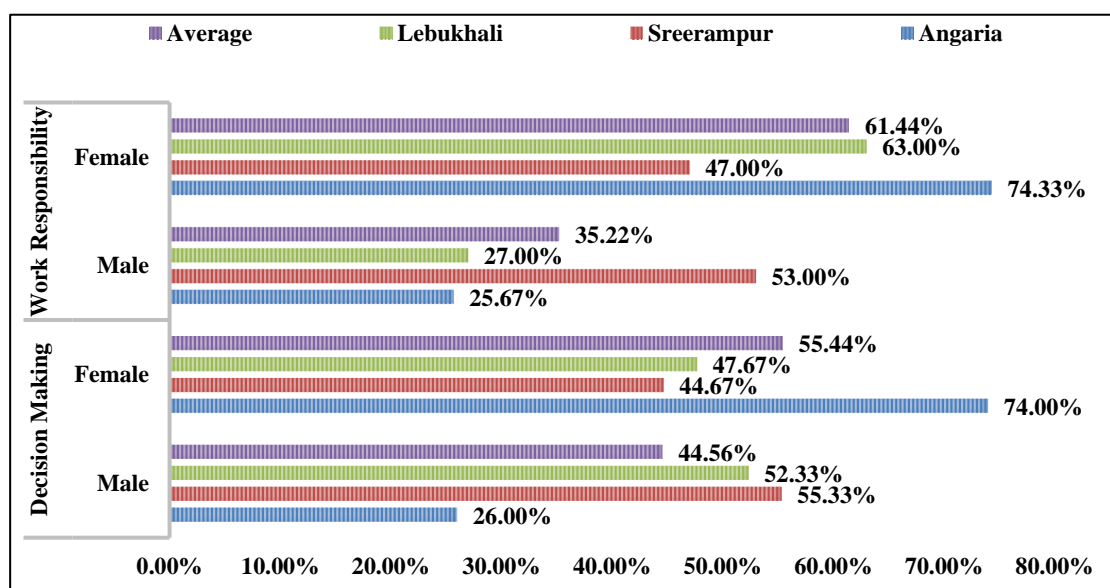


Figure 4.7: Decision Making and Work Responsibility of The Respondent

Source: Field Survey 2019

However, gender equality and diversity are recognized to have beneficial effects on organizations, institutions and the overall economy. This study provides evidence that removing the glass ceiling – the invisible barriers which prevent women from reaching

upper-level positions – may produce not only more equality but also substantial efficiency gains.

In the survey area, the female plays the major role in both decisions making and work responsibility of the homestead activities. Amounts the three union selected respondent of Angaria was being the most contributory 74 percent both in decision making and work responsibility share. Lowest in Sreerampur union where 47 percent women share work responsibility and 45 percent dominant in decision making. Lebukhali being in middle. (Figure 4.7)

4.17 Disposal Pattern of Vegetables Grown in Homestead

In the study area it was observed that homestead vegetables were normally grown for

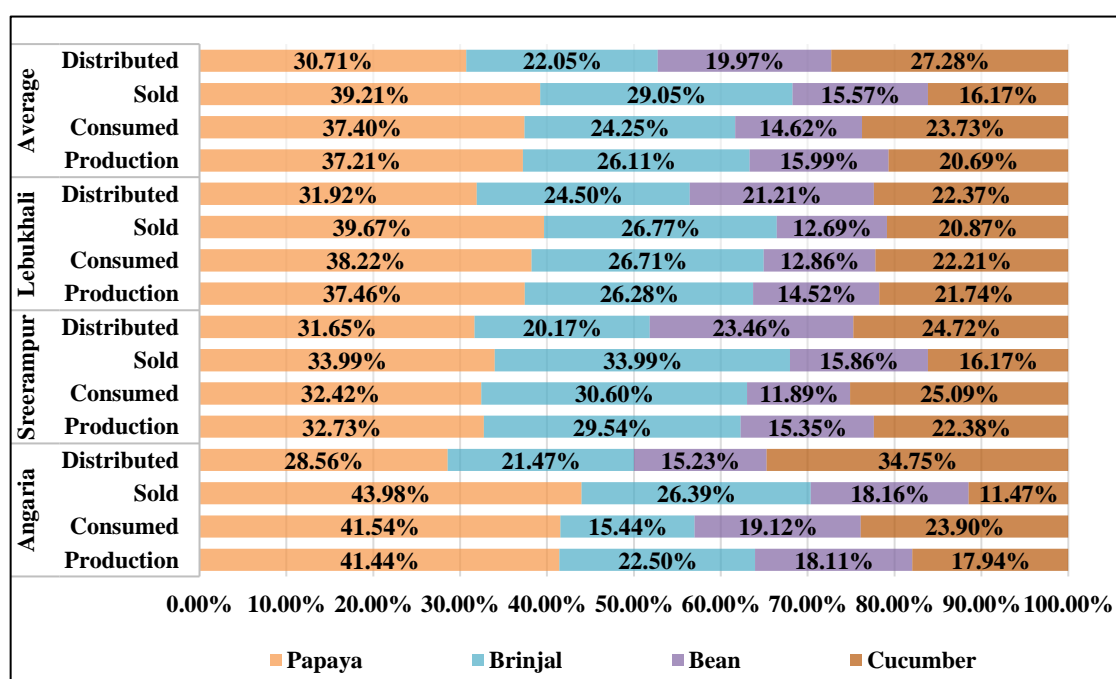


Figure 4.8: Disposal pattern of Vegetables Grown in Homestead

Source: Field Survey, 2019

sell and family consumption. Figure 4.8 shows that selected rural women sold 44, 34 and 40 percent and consumed 42, 32 and 38 percent papaya in Angaria, Sreerampur and Lebukhali unions respectively. Bean being the least in production, sell and consume.

4.18 Concluding Remarks

This chapter considered the socio-economic characteristics of the rural women of homestead vegetable producers. It is clear from the above discussion that socio-economic characteristics differs from respondent to respondent.

CHAPTER 5

FINANCIAL PROFITABILITY OF HOMESTEAD VEGETABLE PRODUCTION

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PRODUCTION

5.1 Introduction

The main purpose of this chapter is to evaluate the costs, return, and profitability of growing homestead vegetables (Papaya, Bean, Brinjal and Cucumber). In order to determine profitability of produced homestead vegetables, it is necessary to calculate different types of cost items. For each production process, costs play a significant role in making the right decision for the grower. Considering its importance, the present study emphasized the different costs items. Inputs costs were calculated on the basis of prevailing market prices, while the value of outputs of the homestead vegetables was determined by using prices. Costs and return of homestead vegetables production are estimated in this chapter. In this chapter gross return, gross margin, net return for homestead vegetables were determined. Besides this undiscounted Benefit Cost Ratio (BCR) is also calculated to determine the profitability of homestead vegetables.

To estimate costs, return and profitability of homestead vegetables the costs items were classified into two groups-

- 1) Variable cost
- 2) Fixed cost

5.2 Estimation of Variable Costs of Homestead Vegetable Production

Variable costs are the costs of variable inputs. Variable costs included the costs of all variable factors like human labor, seeds, fertilizers, manure etc. These costs vary with the level of production. The higher the production, the higher variable costs; the lower the production, the lower the variable costs. The variable costs items for the production of homestead vegetables (Papaya, Bean, Brinjal and Cucumber) were classified under the subsequent headings:

- 1) Costs of Human labor
- 2) Costs of Seed
- 3) Costs of Fertilizer (Urea, TSP, MOP, DAP)
- 4) Costs of Manure (Cow dung, Excreta of chickens, Ash, Compost)

5.2.1 Costs of Human Labor

Human labor was one of the most important and most widely used inputs for the production of homestead vegetables. It shared a large part of the total costs of homestead vegetables in the study area and it is required for various farm operations such as; land preparation, seed sowing, fertilizer and manure application, weeding etc.

The sources of human labor were:

- (a) Family labor for which no payment was made and
- (b) Hired labor for which farmers had to pay in cash.

Family labor includes the operator him/herself and other members of the family while hired labor includes permanent hired labor and labor employed on daily contract basis. In pricing the labor no distinction was made between the unpaid family and the contracted labor. In the present study, human labor was measured in terms of man-day's unit which family labor was priced at the prevailing wage rate in cash to hired labor. The wage rate was set for various types of activities. To avoid complexity, average rate has been considered that is one man-day equals 8 hours of work. In the study areas the computed average rate was Tk. 500 per man-days for homestead vegetable production. The cost varied in three selected areas due to the difference in salinity in the soil and also scarcity of labor.

It is revealed from Table 5.2 that the cost of hired labor for homestead vegetable production was Tk. 41567 which covered 22.82 percent of the total cost. On the other hand, family labor cost was calculated at Tk. 45400 which covered 24.92 percent of the total cost.

5.2.2 Cost of Seeds

The costs of seed are the single most important cost element for the production homestead vegetable (Papaya, Bean, Brinjal and Cucumber). In the study areas, it was found selected rural women used home supplied, purchased and seeds from different NGO. The rural women mainly used home supplied seed but sometimes they had to buy seed for producing homestead vegetable production. The costs of vegetable seed varied

in the study areas depending on the quality and availability of seeds. The costs of home supplied seeds were determined at the ongoing local market rate in the study areas and costs of purchased seeds were calculated on the basis of actual prices paid by the rural women. The average quantity of vegetable seed used by the selected respondents was 8.21 kg/ha (Table 5.1). Per hectare seed cost was higher in Lebukhali union than Sreerampur followed by Angaria union. Costs of seed per hectare was calculated Tk. 1651.67 which was 0.91 percent of total cost. (Table 5.1).

5.2.3 Costs of Chemical Fertilizers

Application of recommended doses of fertilizers is a major requirement of any crop. Fertilizer is an important input for production of homestead vegetables. In the vegetable production rural women used a small quantity of fertilizers. It was found in the study area selected rural women used different types of fertilizers in producing their vegetables. All the fertilizers were purchased. Four types of chemical fertilizers, namely Urea, TSP (Triple Super Phosphate), MOP (Muriate of Potash), DAP (Diammonium Phosphate) etc. were used by the rural women. Uses of these fertilizers influence the increase in the production. Fertilizer costs were calculated at the prevailing market prices that were actually paid by the rural women. On an average, selected rural women used Urea, TSP, MOP and Dap 239.01 kg, 92.59 kg, 97.17 kg and 175.25 kg per hectare. The average price of Urea TSP, Mop and DAP was 17.88 Tk/kg, 30 Tk/kg, 21.49 Tk/kg and 1.80 Tk/kg respectively in the study area. The estimated cost of fertilizer is shown in Table 5.2. Average per hectare cost of Urea, TSP, MOP and DAP were Tk. 4273.87, Tk. 2777.08, Tk. 2047.33, and Tk. 326.80 respectively which constituted 2.35percent, 1.52 percent, 1.12 and 0.18 percent of total cost.

5.2.4 Costs of Manure

Manure is beneficial for increasing organic matter in the soil to eventually increase the yield of vegetable. In the study area most of the rural women used vegetable production. The selected respondents used cow dung, excreta of chickens, ash and compost as manure to produce homestead vegetables. Respondents used both home supplied and purchased manure but the proportion of home supplied manure was greater than that of purchased manure. There was no fixed rate to purchase manure in the study area. Per kg price of cow dung, Excreta of chickens, Ash and Compost were Tk. 0.50, Tk 1, Tk 0.50 and Tk. 0.50 respectively. It is revealed from Table 5.2 that per hectare costs of manure

were Tk. 1669.34, Tk. 762.52, Tk. 745.02 and Tk. 687.92 for Angaria, Sreerampur and Lebukhali union respectively.

5.2.5 Interest on Operating Capital

Interest on Operating Capital was calculated by taking all the variable costs incurred for various operations in the production of homestead vegetable like human labor, seeds, fertilizers and manure cost etc. It was estimated at average operating costs during the production period because not all costs were incurred at the beginning or at any fixed time. Interest on Operating Capital was charged at the rate of 6% and three months were considered as the period of production of homestead vegetables (Papaya, Bean, and Brinjal Cucumber) in the study areas and consequently, operating capital costs were estimated. Average Interest on Operating Capital was calculated Tk. 6114.49 per hectare which shared 3.36 percent of total cost. (Table 5.2).

5.2.6 Total Variable Cost

Total variable costs calculated by adding all the variable inputs. In the study area total variable costs varied from year to year. In the study area, per hectare variable costs for homestead vegetable production was Tk. 113452.03 Tk. 96177.44 and 114438.67 in Angaria, Sreerampur and Lebukhali union respectively (Table 5.2). Total variable costs were higher in Lebukhali union than Angaria and Sreerampur union. The average variable cost of homestead vegetable production was Tk. 108022.72 per hectare. In percentage terms total variable cost cover 59.30 percent. (Table 5.2)

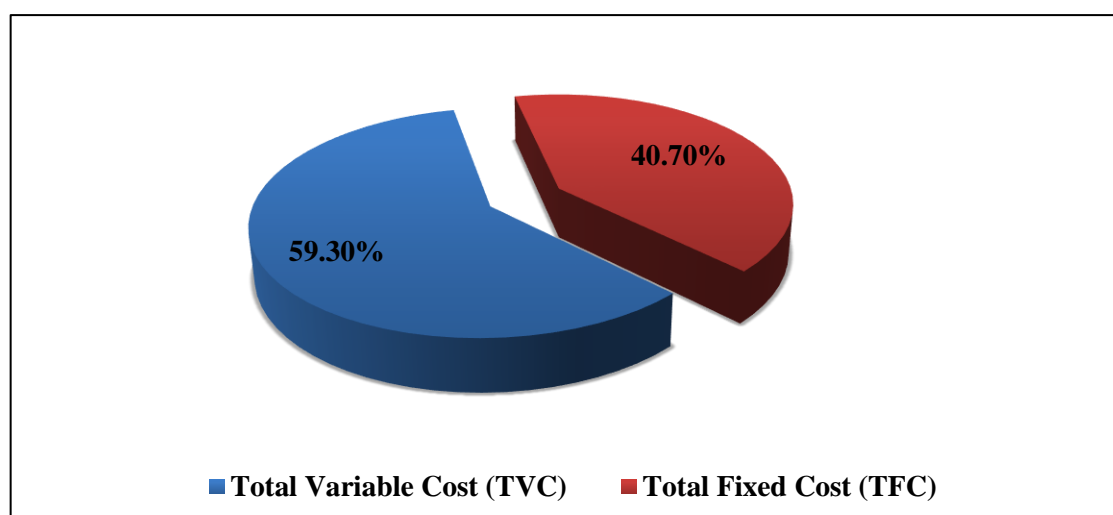


Figure 5.1 Percentage of Variable and Fixed Cost to Total Cost of HVP

Source: Field Survey, 2019

5.3 Estimation of Fixed Cost of Homestead Vegetable Production

Fixed costs are the amount spent by the farm on fixed inputs within the short run. Fixed costs remain fixed because the farm does not change its size and the number of fixed factors used. Fixed costs are those that do not change in magnitude when the quantity of production changes and are incurred even after production has not taken place. In the present study, for the production of homestead vegetables only the cost of land use is considered as a fixed cost.

5.3.1 Rental Value of Land Cost

Most of the rural women produce Homestead vegetables (Papaya, Bean, Brinjal Cucumber) on their own land. If they would lease out their land they might have received money for it. The money they could have received per hectare was considered as the opportunity cost of land use. The rural women use the land as per the conditions of leasing arrangement. The term leasing cost explains the value which was needed for homestead vegetables production for a particular period of time. Leasing cost varies from place to place depending on the location, fertility, topography of the soil and distance from water sources etc. In the present study land use cost for homestead vegetable production was computed at the prevailing rental value of land per hectare for the actual year was considered in the study area. Land use cost was computed for the cropping period of three months for homestead vegetables production (Papaya, Bean, Brinjal Cucumber). Per hectare average rental value of land in Angaria, Sreerampur and Lebukhali union were estimated Tk. 74147.1 (Table 5.2)

5.3.2 Total Fixed Costs

The average fixed costs of Homestead vegetables production were Tk.74147.1 per hectare. In percentage terms total fixed cost covered 59.30 percent.

Table 5.1: Per Hectare Level of Input Used for HVP

Items	AREAS							
	Angaria		Sreerampur		Lebukhali		Avg. on Dumki	
	Qtn	Price	Qtn	Price	Qtn	Price	Qtn	Price
Human labor (Man -days)								
Hired labor (Man - days)	65.00	500.00	88.00	400.00	95.00	600.00	83.00	500.00
Family labor (Man - days)	120.00	500.00	105.00	400.00	57.00	600.00	94.00	500.00
Seed (kg)	7.53	165.83	8.30	192.50	8.81	239.33	8.21	199.22
Chemical fertilizers (kg)								
Urea	284.18	17.87	272.01	17.90	160.85	17.87	239.01	17.88
TSP	70.85	30.00	67.97	30.03	138.96	29.97	92.59	30.00
MOP	70.77	22.20	67.91	22.23	152.83	20.03	97.17	21.49
DAP	246.85	2.67	92.69	2.00	186.22	0.73	175.25	1.80
Manures (kg)								
Cow dung	3,881.74	0.50	2,992.66	0.50	3,141.64	0.50	3,338.68	0.50
Excreta of Chickens	82.39	1.00	540.99	1.00	1,664.19	1.00	762.52	1.00
Ash	1,715.68	0.50	1,342.20	0.50	1,412.22	0.50	1,490.03	0.50
Compost	1,934.00	0.50	1,244.72	0.50	948.80	0.50	1,375.84	0.50

Source: Field Survey, 2019

5.4 Total Cost

Total cost is a sum of total variable cost and total fixed cost. Costs of all resources that utilized in the production of homestead vegetables were added together in order to computed per hectare total cost. In the study area, per hectare total cost of homestead vegetables production was calculated at Tk. 187599.13, Tk. 170324.55 and Tk. 188585.77 in Angaria, Sreerampur and Lebukhali union respectively. The average total cost of homestead vegetable production was calculated Tk 182169.82 per hectare. It can be seen form the table, total cost higher in Lebukhali union than other the two unions. (Table 5.2)

Table 5.2: Per Hector Cost of HVP in The Study Areas

Particulars	Angaria (Tk/ha)	Sreerampur (Tk/ha)	Lebukhali (Tk/ha)	All Areas (Tk/ha)	Percentage (%)
A. Variable Cost					
Human Labor					
Hired labor	32,500.00	35,200.00	57,000.00	41,567.00	22.82
Family labor	60,000.00	42,000.00	34,200.00	45,400.00	24.92
Seed	1,248.14	1,597.48	2,109.40	1,651.67	0.91
Chemical Fertilizers					
Urea	5,078.25	4,868.99	2,874.37	4,273.87	2.35
TSP	2,125.55	2,041.10	4,164.60	2,777.08	1.52
MOP	1,571.09	1,509.72	3,061.18	2,047.33	1.12
DAP	659.09	185.37	135.94	326.80	0.18
Manure					
Cow dung	1,940.87	1,496.33	1,570.82	1,669.34	0.92
Excreta of Chickens	82.39	540.99	1,664.19	762.52	0.42
Ash	857.84	671.10	706.11	745.02	0.41
Compost	967.00	622.36	474.40	687.92	0.38
Interest on Operating Capital (IOC) @6% and 3 months	6,421.81	5,444.01	6,477.66	6,114.49	3.36
Total Variable Cost (TVC)	113,452.03	96,177.45	114,438.67	108,022.72	59.30
B. Fixed cost					
Rental Value of Land	74,147.10	74,147.10	74,147.10	74,147.10	40.70
Total Fixed Cost (TFC)	74,147.10	74,147.10	74,147.10	74,147.10	40.70
C. Total Cost (A+B)	187,599.13	170,324.55	188,585.77	182,169.82	100.00

Source: Field Survey, 2019

5.5 Estimation of Returns of Homestead Vegetables Production

5.5.1 Gross Return

Gross return is the money value of the entire production. Gross return per hectare consisted of the value of main product. In this study per hectare return was calculated by multiplying the entire quantity of products by their respective market prices that the selected rural women received. Table 5.3 shows that per hectare gross return of homestead vegetables (Papaya, Brinjal, Bean, Cucumber) were Tk. 422523.13, Tk. 272434.26, Tk. 324068.14 at Angaria, Sreerampur and Lebukhali union respectively. Gross return was higher in Angaria union than other two unions. (Table 5.3)

5.5.2 Gross Margin

Gross margin is defined as the difference between gross return and total variable cost. The argument for using gross margin analysis is that the vegetables owners of Bangladesh are more interested to understand their maximum yield on variable cost. Because the estimation of fixed cost of production is difficult to determine. Moreover, within the context of farm planning the gross margin analysis is widely used. Gross return from homestead vegetable production was calculated and their respective total variable cost was deducted from the respective gross return to gain a margin which is named margin of profit. From Table 5.3 Gross margins were found to be Tk. 309071.10, Tk. 176256.81, and 209629.47 per hectare for Angaria, Sreerampur and Lebukhali union respectively. Per hectare average gross margin was found Tk. 231652.46. Gross margin was higher in Angaria union compared to other two unions.

5.5.3 Net Return

Net return was obtained by deducting total costs from gross return. The Calculated net return represents the yield of any farm. To assess the profitability of homestead vegetable production, net return is a crucial aspect. Per hectare net return was Tk. 234924.00, Tk. 102109.71 and 135482.37 for Angaria, Sreerampur and Lebukhali union respectively. The average net return per hectare for all areas was Tk. 157505.36. Net return was higher in Angaria union compared to other two unions. (Table 5.3)

Table 5.3: Per Hectore Profitability of HVP in The Study Areas

Particulars	Angaria (Tk)	Sreerampur (Tk)	Lebukhali (Tk)	All Areas (Tk)
Total Cost	187,599.13	170,324.55	188,585.77	182,165.81
Total Variable Cost	113,452.03	96,177.45	114,438.67	107,952.05
Total Fixed cost	74,147.10	74,147.10	74,147.10	74,147.10
Gross Return	422,523.13	272,434.26	324,068.14	339,675.18
Gross Margin	309,071.10	176,256.81	209,629.47	231,652.46
Net Return	234,924.00	102,109.71	135,482.37	157,505.36
Rate of Return (BCR)				
BCR on Full Cost	2.25	1.60	1.72	1.86
BCR on Variable Cost	3.72	2.83	2.83	3.13

Source: Field Survey 2019

5.5.4 Benefit Cost Ratio (Undiscounted)

Benefit Cost Ratio (BCR) is a relative measure which is employed to compare benefits per unit of costs. The undiscounted benefit cost ratio (BCR) was calculated by dividing gross return by total cost. It indicates the yield per taka invested. It is useful for analyzing the financial efficiency of the farm and is also used to obtain the profitability of homestead vegetable production. BCR on variable costs of homestead vegetable production was 3.72, 2.83 and 2.83 for Angaria, Sreerampur and Lebukhali union respectively. Per hectare overall BCR on full cost and on variable cost were found 1.86 and 3.13 respectively (Table 5.2). It was evident from the study that, Benefit Cost Ratio (BCR) of homestead vegetable was accounted for 1.86 which implies that Tk. 1.86 would be earned by investing Tk. 1.00 for homestead vegetable production and also indicate that homestead vegetable production was profitable in the study area. Per hectare BCR on full cost and BCR on variable cost both higher in Angaria union compared to other two unions.

5.6 Concluding Remarks

Profitability of a crop depends on yield, price of the product, and cost of inputs as well. Any variation in any of the above factors obviously will change the profitability. It is changed over time, place and management level.

From the above result and discussion, it is seen that there is some variation in the profitability of homestead vegetable in three union. Per hectare total cost was found higher in Lebukhali than Angaria and then Sreerampur union. But per hectare return and BCR was found higher in Angaria than Lebukhali than Sreerampur union. The findings show that homestead vegetable production in Angaria was more profitable than Lebukhali and Sreerampur union. It is clear from above mentioned discussion that in the study areas of Patuakhali district, in homestead vegetable production women participation was highly prominent. On the basis of above discussion, it could cautiously be concluded that the cultivation of homestead vegetable production is profitable.

CHAPTER 6

FACTORS AFFECTING PRODUCTION OF HOMESTEAD VEGETABLES

CHAPTER 6

FACTORS AFFECTING PRODUCTION OF HOMESTEAD VEGETABLE

6.1 Introduction:

The focus of this chapter is to estimate and relate the main factors that affect the yield of homestead vegetable production. In this chapter, an attempt has been made to identify and measure the effects of some important variables on the gross yield of homestead vegetable production. For this reason, Cobb-Douglas production model was used to determine the contribution of key variables and effects of different variables on gross output of the production process.

6.2 Functional Analysis for Measuring Production Efficiency

The production function is a mathematical function that identifies the maximum output that can be produced with given inputs for a given level of technology. To explore the effects of variable inputs, the Cobb-Douglas production function was estimated initially. Cobb-Douglas production was applied to determine the effects of resources used on the gross yield of the homestead vegetable production. The results of the Cobb-Douglas model seemed superior in theoretical and econometric terms because-

- 1) Adequate fit of the data
- 2) Computation feasibility
- 3) Sufficient degrees of freedom to allow for statistical testing. So, this model was accepted.

Many factors can influence vegetable production as well as gross returns. These variables were considered as priory explanatory variables that are responsible for variation in gross returns. In the study area, given the importance and potentiality of the inputs for cultivating homestead vegetable production six explanatory variables namely seed, human labor, Urea, TSP, MOP and manure were taken into consideration for production function analysis. The individual and total effects of these inputs on the dependent variables can be explained to some extent by multiple regression analysis.

The following Cobb-Douglas production model was used in the present study

$$Y = aX_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} X_5^{b_5} X_6^{b_6} e^{u_i}$$

In linear form, model is written as follows:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + u_i$$

The estimated production function for homestead vegetable was:

$$Y = 4.445^{***} - 0.229^{***} + 0.662^{***} + 0.494^{***} - 0.519^{***} + 0.248^{**} + 0.124$$

(1.399) (0.05) (0.102) (0.129) (0.146) (0.104) (0.081)

(The figures in the parentheses are standard errors and the asterisk sign indicates the level of significance)

6.3 Estimated Value of The Cobb-Douglas Production Function Analysis:

The estimated values of the co-efficient and related statistics of the production function are presented in (Table-6.1).

Important features of the model are:

- ✓ For testing the significance level of individual co-efficient which has sufficient degrees of freedom such as 1 percent, 5 percent and 10 percent probabilities were used.
- ✓ Goodness of fit of the model was measured by F-test. F value was highly significant implying that all the included explanatory variables are important for explaining the variation of income of rural women in homestead vegetable production.

- ✓ The co-efficient of multiple determinations (R^2) means the total variations of output explained by the explanatory variables included in the model.
- ✓ Stage of production was estimated by returns to scale which was the summation of all the production elasticity of various inputs.

Table 6.1: Estimated values of Co-efficient and Related Statistics of Cobb-Douglas Production Function

Regression Variables	Regression Coefficient	Standard Error	t-value
Intercept/constant(a)	4.445***	1.399	3.178
Seed cost(X_1)	-0.229***	0.05	-4.551
Human labor cost(X_2)	0.662***	0.102	6.469
Urea cost(X_3)	0.494***	0.129	3.818
TSP cost(X_4)	-0.519***	0.146	-3.556
MOP cost(X_5)	0.248**	0.104	2.391
Manure cost(X_6)	0.124NS	0.081	1.528
R Square	0.75		
Adjusted R Square	0.73		
Returns to scale	0.78		
F - Value	41.08***		

Source: Field Survey (2019)

Note: * Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

NS: Not Significant

6.4 Interpretations of Result:

6.4.1 Constant or Intercept Term

The value of constant represents the composite impact of all other influencing variables that are excluded from the model. Six individual variables were taken into consideration for production analysis of homestead vegetables.

6.4.2 Seed Cost (X1)

The regression coefficient of seed cost was (-0.229) with a negative sign. The coefficient was statistically significant at one percent probability level. It implies that one percent increase in seed cost, keeping other factors constant, would decrease gross return by 0.229 percent. (Table 6.1).

6.4.3 Human Labor Cost (X2)

The regression co-efficient of human labor cost was 0.662 with a positive sign. The coefficient was statistically significant at one percent probability level. It implies that one percent increase in human labor cost, keeping other factors constant, would increase gross return by 0.662 percent (Table 6.1).

6.4.4 Urea Cost (X3)

The regression co-efficient of Urea cost was 0.494 with a positive sign. The coefficient was statistically significant at one percent probability level. It implies that one percent increase in Urea cost, keeping other factors constant, would increase gross return by 0.494 percent (Table 6.1).

6.4.5 TSP Cost (X4)

The regression coefficient of TSP cost was (-0.519) with a negative sign. The coefficient was statistically significant at one percent probability level. It implies that one percent increase in TSP cost, keeping other factors constant, would decrease gross return by 0.519 percent (Table 6.1).

6.4.6 MOP Cost (X5)

The regression co-efficient of MOP cost was 0.248 with a positive sign. The coefficient was statistically significant at five percent probability level. It implies that one percent increase in MOP cost, keeping other factors constant, would increase gross return by 0.248 percent (Table 6.1).

6.4.7 Manure Cost (X6)

The regression co-efficient of manure cost was 0.124 with a positive sign but insignificant. It implies that manure cost had no significant effect on production of homestead vegetables in the study. (Table 6.1).

6.4.8 Co-efficient of Multiple Determinations (R^2)

The co-efficient of multiple determinations (R^2) is a summery measure that indicates how the sample regression line fits with the data (Gujarati,1995). From Table 6.1 it can be seen that the value of co-efficient of multiple determinations was 0.75. It indicated that 75 percent variations in the gross return were explained by the explanatory variables which were included in the model. In other words, 25 percent of total variation in the gross return is unexplained.

6.4.9 Adjusted R^2

Here the term adjusted indicates adjusted for the degrees of freedom. The value of adjusted R^2 was found to be 0.73 which indicated about 73 percent of the variations of the output were explained by the explanatory included in the model (Table 6.1).

6.4.10 Goodness of Fit (F-Value)

F statistics was calculated to determine the overall significance of the estimated model. The F value is used to determine if the explanatory variable really has a significant influence on the dependent variables.

The F value of homestead vegetable production was calculated at 41.08 which was highly significant at a significant level of 1 percent, implying that the variation in the gross yield dependent mainly on the explanatory variables included in the model and also indicated that all the explanatory variables that are included in the model were important in explaining the variations in the gross output of homestead vegetable production. (Table 6.1).

6.4.11 Returns to Scale

This is the rate at which the output changes when all inputs are changed proportionally. The sum of all the production co-efficient of the estimated model indicates returns to

scale. Returns to Scale of homestead vegetable production was calculated by summing all the co-efficient that is, the response of production to a proportional change in all inputs. The value of returns to scale was estimated as 0.78 for homestead vegetable production. It indicates that if all inputs specified in the model were increased by 1 percent, the average gross yield would increase by 0.78 percent.

6.5 Concluding Remarks

The overall performance of Cobb-Douglas production function model for homestead vegetable production was satisfactory as indicated by the estimated R^2 and F-value. The estimated values of the model indicated that the included main variables had significant and positive effect on homestead vegetable production except insignificant effect of manure.

CHAPTER 7

PROBLEMS OF HOMESTEAD VEGETABLE CULTIVATION

CHAPTER 7

PROBLEMS IN HOMESTEAD VEGETABLE PRODUCTION

7.1 Introduction

The present study was carried out to identify the main problems faced by the rural women who were involved in production of homestead vegetables. In general, it is accepted that the small producers in Bangladesh do not have access to the desired amount of seeds, fertilizers, insecticides, technical assistance and finally fair price for their products. They fail to achieve their goal due to some technical financial, marketing and social issues. Although cultivating homestead vegetable production on farms is profitable at the farm level, rural women face numerous issues and limitations for their production. These problems and constraints affected production as well as profitability to the selected rural women in the study area. The problem and constraints were classified into three general groups-

- i. Economic and Technical problems
- ii. Marketing problems
- iii. Social and natural problems

This section attempts to identify the problems of homestead vegetables producers and their responses were presented. The major problems identified by them were mentioned below-

7.2 Major Problems Reported by Selected Rural Women in The Study Area

The rural women were asked to give their opinion regarding the problems and constraints of homestead vegetables production. The problems were found to be not identical and different from each other. However, the main problems were detailed below according to the intensity reported by rural women.

7.2.1 Attack by Pest and Diseases

In case of homestead vegetables (Papaya, Brinjal, Bean, and Cucumber) production, Insect Infestation is an important limitation. Pest and diseases were the serious problem for the production of homestead vegetable in the study areas. Rural women complained that pest and diseases attacked at all stages of these vegetables. Homestead vegetables

production was hampered by infestation of insects and pests that could not identify by the rural women. Due to the tenderness of vegetables, the attack of insects, pests, and diseases is more frequent in vegetables crop. Rural women also noticed that stem borer attack the brinjal and locally called “Menda Puka” Aphis (*Linaphis Psculo brassicac*, Davis) which damaged vegetables by sucking up from leaves, shoots and pods. However, the main problem is that most rural women do not have scientific knowledge of production technology and pests and disease management. Due to the high cost of insecticides they were unable to take adequate measures to control diseases and insects. About 82.22 percent of selected rural women reported that the insect infestation problem is very high and was the first most acute problem according to the rank of problem.

7.2.2 Lack of Storage Facility

Lack of storage facility was another major problem for homestead vegetable production. Storage meets the utility of time requirement and removes the time gap barrier between producers and consumers. In the study areas, there were not enough storage facilities to store vegetables. Therefore, the lack of storage facility was a problem that caused damage to these perishable vegetables especially during the peak season. About 70 percent of rural women complained regarding the storage problem (Table 7.1). Storage of vegetables is not possible under ordinary condition because these vegetables are perishable. Therefore, due to lack of adequate storage facilities the rural women did not obtain fair prices for their homestead vegetables. Rural women applied the traditional preservation method for storing vegetable seeds, which was unable to maintain the quality of seeds. Losses during storage may be less if vegetables are stored properly under regulated conditions of temperature and humidity. Therefore, rural women cannot use it to harvest homestead vegetables.

7.2.3 Inadequate Supply of Good Quality Seeds

Inadequate supply of good quality seeds was one of the major problems. Seed is one of the most important vital input. So far, obtaining a satisfactory level of yield good quality seed is crucial. Crop production is highly dependent on the timely availability of good and healthy seeds. Non-availability of improved short duration vegetables seed and its high prices were limiting issue for homestead vegetables production. About 62.22

percent of selected rural women reported this problem that the shortage of good quality seeds during the planting period was a problem and also reported that HYV seeds were not available in local market (Table 7.1) Due to lack of good quality seed rural women generally used home supplies seeds. Sometime inferior good quality vegetables seed were sold in the market. Nobody is there to verify the quality of imported seeds and seed packets. Because of these, rural women are often disappointed with low level of seed germination. Several rural women purchased seeds but noted that in several cases the seeds were not of good quality and therefore the costs of seeds were too high throughout the planting period. Based on the rank of problem, it was the third most acute problem in the study areas.

7.2.4 Lack of Scientific Knowledge & Technology

Lack of technical knowledge was reported to be one of the major problems limiting homestead vegetable production. Rural women do not yet have authentic scientific knowledge about homestead vegetable production. Most of the selected respondents are unaware of the technical information on homestead vegetable production. They were also very reluctant to grow vegetables because of their ignorance and lack of modern technical knowledge. Due to leakage of technical knowledge the cost of vegetable production was high. For that the rural women cannot obtain the real price of homestead vegetables. About 51.11 percent rural women reported that lack of scientific knowledge and technology as the main cause of low productivity (Table 7.1).

7.2.5 Lack of Adequate Transportation Facility

Timely and speedy delivery of vegetables with minimum damage at the lowest cost is vital aspects of transportation. Due to transportation problem the rural women used to sell their product to “Paiker” at the local markets and some sold their products at home is the study areas. Table 7.1 shows that about 47.78 percent rural women faced the lack of transportation facility as a problem Adequate transportation facility at affordable price would improve the efficiency of homestead vegetable marketing.

7.2.6 Non-Availability and High Wage Rate of Labor

Labor is the third most important factor of production. Land preparation, harvesting weeding and seed sowing are the most labor-intensive elements. Since homestead

vegetables were labor intensive crop, unavailability of human labor was one of the main problems for producing homestead vegetables in the study areas. However, the wage rate of labor is incredibly high in the study areas. Following labor shortage, wage increased significantly during the production season. About 40 percent rural women complained concerning higher wage rate and unavailability of labor at due time (Table 7.1). It was the biggest problem that rural women faced in these study areas.

Table 7.1: Problems Faced by The Selected Respondents in Homestead Vegetable Production

Nature of Problems	Percent of Respondent			All	Rank
	Angaria	Sreerampur	Lebukhali		
Attracted by pest & diseases	80	73.33	93.33	82.22	1
Lack of storage facility	70	83.33	56.67	70	2
Lack of quality seeds & fertilizers	60	66.67	60	62.22	3
Lack of scientific knowledge & technology	56.67	50	46.67	51.11	4
Lack of adequate transportation facility	43.33	50	50	47.78	5
High wage rate	50	33.33	36.67	40	6
Low market price of vegetables	36.67	30	43.33	36.67	7
Insufficient water supply during dry season	53.33	36.67	16.67	35.56	8
High prices of Inputs	40	23.33	33.33	32.22	9
Damage by poultry & livestock	16.67	33.33	16.67	22.22	10

Source: Field Survey, 2019

7.2.7 Low Market Price of Product

Low market prices of vegetables were another constraint for the production of homestead vegetables. Price of particular product as an incentive to increase crop production. At the beginning of the season selected rural women get high price for homestead vegetables. But at the end of the season they get low price of homestead vegetables. About 36.67 percent rural women reported that the prices received for homestead vegetables were not adequately attractive for growing homestead vegetables

in the study areas particularly after the crops were harvested. According to the rank of problem, low price of production was the third most serious problem (Table 7.1).

7.2.8 Insufficient Water Supply During Dry Season

Water was required for producing good vegetables. In the dry season, water falls below the minimum level. In the study areas dry season creates serious problem whereby homestead vegetable were damaged by insufficient water supply in due time. About 35.56 percent of selected rural women faced this type of problem. (Table 7.1)

7.2.9 High Prices of Inputs

Fertilizer is the vital input in the production of homestead vegetables. Selected Rural women reported that they have to apply fertilizers for vegetative growth of the plants. Now a days, the price of inputs particularly fertilizers is higher sometimes than the government rate and its distribution channel is quite inefficient. The price of urea was reasonable but price of TSP and Mop fertilizer was high. Some of the rural women in the study areas can hardly afford an adequate dose of fertilizers. It was shown in Table 7.1 revealed that about 32.22 percent rural women complained about high rate of fertilizer prices. High price of inputs was the almost serious problem according to the rank of problem.

7.2.10 Vegetables Damaged by Poultry or Livestock

Crop damage by wild animal was an acute problem in the production of homestead vegetables. Most of the rural women did not fence their vegetables in homestead. They noted that vegetables were grown scattered around the homestead and poultry or livestock often damaged the vegetables. Rural women gained experience that in the initial stage the plants were affected by the cattle and goats. About 22.22 percent rural women reported that damage caused by livestock and poultry for producing vegetables in homestead. (Table 7.1)

7.3 Concluding Remark

Homestead vegetables found profitable and has high domestic demand for their production should be expanded. The discussions mentioned above as well as the results presented in table 7.1 indicates that rural women who produce homestead vegetables

(Papaya, Brinjal Bean, Cucumber) have currently faced some major problems in the cultivation of homestead vegetables, these are the main limitations for the producers of homestead vegetables in the study areas. Homestead production could possibly be greatly increased if the above-mentioned problems and limitations could be solved.

Public and Private initiative should be taken to eliminate these problems for the better production of these vegetables. Then it could help selected rural women to increase their income as well as standard of living.

CHAPTER 8

SUMMARY, CONCLUSION AND RECOMMENDATIONS

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8.1 Summary of The Study:

The small-scale holders who have very little land devoted to vegetable production to solve problems of malnutrition is to grow vegetables intensively in the homestead. This can also generate income and employment for family members. Homestead farming is the most significant system of production in rural Bangladesh. In Bangladesh, women hardly participate in agricultural activities outside their homes. Bangladeshi women play a significant role in agricultural production as wage earners. vegetable occupy a very important place in rice based cropping systems and play a distinct role in the crop sub-sector to provide nutritious food to the dwellers, generate income, employment. Many vegetables are grown in homestead. Homestead is the dwelling place and it is the center where vegetables are cultivated. However, many small homesteads of Bangladesh remain unutilized, underutilized or not scientifically managed, which could be brought under round the year vegetable cultivation for reducing nutritious problem.

The present study was, therefore, undertaken with a view to the specific objectives which are as follows:

- 1) To find out the socio-economic characteristics of the respondents;
- 2) To determine the profitability of homestead vegetable production;
- 3) To identify the factors affecting homestead vegetables production;
- 4) To identify the problem faced by women in homestead vegetables production in the study area.

In the study areas, samples were randomly collected from three upazila of Patuakhali district where most of the rural women were involved in homestead vegetable cultivation. A total of 90 rural women were selected where each upazila represents 30 respondents. All the data were computerized, summed up and scrutinized carefully to mitigate all possible errors. Both tabular and functional analysis had been done by using MS Excel and SPSS programs to get the related statistics and parameters. Necessary primary and secondary data were collected for the study. The study is mainly based on

primary data, which were collected from selected rural women who were interviewed personally with the help of pre-tested questionnaires through face to face interview during the period from August-September, 2019. All the data were computerized, summed up and scrutinized carefully to mitigate all possible errors. Both tabular and functional analysis had been done by using MS Excel and SPSS programs to get the related statistics and parameters.

In this study, an attempt had been made to identify the socioeconomic characteristics of the selected rural women. Socio-economic characteristics of the selected rural women include age, family size, education level, occupation level, farming experience, annual income and family expenditure etc. It was evident from the study that selected rural women were more or less educated. It is found that the percentage of secondary level education was largest in all areas. Agriculture is the main occupation in the study areas. Most of the rural women used seed that they collected free from NGO. Rural women in Angaria, Sreerampur and Lebukhali union collected 35.82 percent, 31.17 percent and 33.33 percent seed from NGO. And also seed collected from relatives and purchase from market as well as some used seed from their own source. In Angaria, Sreerampur and Lebukhali union 86.60 percent, 86.60 percent and 76.60 percent rural got the opportunity to have training about the vegetable production. Most of the selected rural women in Angaria, Sreerampur and Lebukhali union 51.28 percent, 57.14 percent and 51.22 percent got training from the NGO name LHCB (Lutheran Health Care Bangladesh).

Prevailing market price was used to estimate the cost of purchased inputs and for home supplied inputs. Opportunity cost principles was used. 6% bank interest rate per annum was used to calculate the opportunity cost of operating capital.

Cost and return were calculated to know the income from vegetable cultivation. The cost items were human labor, fertilizer, manure, seed, interest on operating capital and land use cost. For determining the profitability of vegetable production both the inputs and outputs were esteemed at market price during the study period and measured on the basis of net return, gross margin and benefit cost ratio. The analysis of cost and return revealed that human labor was important element for producing homestead vegetable. The total cost of human labor was Tk. 92500, Tk. 77200, Tk. 91200 per hectare for Angaria,

Sreerampur and Lebukhali respectively. Per hectare total cost of homestead vegetable production were Tk. 187599.13, Tk. 170324.55, Tk. 188585.77 for Angaria, Sreerampur and Lebukhali respectively.

Per hectare yield for Angaria, Sreerampur and Lebukhali was 422523.13, 272434.26 and 324068.14 kg. Per hectare gross margin and net return were Tk. 231652.46 and Tk. 157505.36 for all areas respectively. On the basis of BCR on full cost (2.25) and BCR on variable cost (3.72) was higher in Angaria union in comparison to Sreerampur and Lebukhali union. The average BCR on full cost for all areas was 1.86 which implies that one-taka investment generated 1.86 taka. From the above results we can see that homestead vegetable cultivation was profitable in the study areas.

Cobb-Douglas production function was used to examine the effects of the independent variables on the dependent variable in the production of vegetable production. The chosen explanatory variables were human labor, seed, fertilizer and manure. And in vegetable production, the variables were significant in explaining the gross production except a negative and insignificant effect of manure. The coefficient with expected sign indicates the selected inputs contributed positively to the gross return. The value of R^2 was 0.75 that indicates 75 percent of the total variation of vegetable production could be explained by the independent variables. F-value of the production function was 41.08. It was significant at one percent level of significance, which implies good fit of the model.

Male respondents play the main role for decision making of the homestead activities. Female was responsible for execution of the decision of homestead activities. Homestead vegetables were grown normally for family consumption and surplus to sell. While men were mostly involved in land preparation as well as women participated in planting, seedling sowing, weeding, applying manure and fertilizer and lift and carry too. Women were the main contributors to family income through the practice of homestead vegetable production by rural women in the study areas.

The study also identified the problems faced by the selected rural women during vegetable production. With regard to major problem, Attack by pest and diseases, Lack of storage facility, inadequate supply of good quality seeds, Non-availability of labor

and high wage rate, transportation problem. Among them Attack by pest and diseases and lack of storage facility one of the most acute problem that rural women faced during producing homestead vegetables.

There are some suggestions also, which were given by the respondents of the study. Among them arrangement of training programme, setting up cold storage facility, provide good quality seed, Timely and adequate supply of pesticides and insecticides.

8.2 Conclusion

Homestead was found to be the source of vegetables income for all categories of rural women. It may be the means of livelihood particularly of rural women who have few resources. The analysis shows that, in the study area production of homestead vegetables (Brinjal, Bean, Cucumber, Papaya) were profitable and women play an important role in cultivation of vegetable which makes it possible to meet the nutritional and agricultural demand of the country, overall standard of living of the rural women. But most of the women in our country are not aware of the benefits of vegetable production. Selected Rural women in the study areas did not know how to apply adequate doses of inputs. Providing training according to their needs and problem may lead them to improve production and income from homestead vegetable cultivation. Expanding homestead vegetable could overcome the problem of low income and unemployment of the selected rural women in terms of profitability, income and employment generation. Vegetable production can be a potential tool to reduce poverty and ensure food security. Therefore, to meet the ever-growing demand for food nutrition, it is necessary to continue to improve the rate and degree of participation of rural women in different family and farming activities. Particularly, workers of both Government (GO) and Non-Government organization (NGO) should provide appropriate technical and management related information to all the rural women in the study areas through continuous improvements in extension and other support services. The relevant authority should take necessary training and skill development program like training on vegetable cultivation, poultry raising and goat rearing etc. so that the selected rural women could increase agricultural production in their homestead as well as increasing their family income.

8.3 Recommendations

In my study area homestead vegetable gardening has been shown to be an additional source of income for the household through the sale of garden produce after family consumption. The production is profitable so it is also elevating household self-sufficiency. Since women are in the center of caretakers, it empowering them through contributing on family well-being. So, there is an excellent opportunity to increase the productivity of vegetables due to seasonal scarcity. To achieve a positive change in the productivity of vegetables the following recommendations are made based on the result of this study. These are as follows:

- 1) In my study area many local opportunist companies selling seeds in double price but those are less productive than government ones. Due to the disaster proneness most of the government support goes to government's revenue project free of cost which allowing them to that. As a result, we are losing expected production. If the government concentrate on that it may increase productivity with reduced cost.
- 2) It's being observed in my study area that NGOs are dominant in giving trainings to the women. After the training they only provide few packets of seeds. But they need finance to grow vegetables year-round. Community based organizations (CBOs) could provide that support if government worked with NGOs.
- 3) Essential trainings could be organized to ensure proper utilization of every available space of homestead to grow different vegetables in modern method rather than traditional method to increase productivity. GO and NGO may work together in partnership to foster that.
- 4) The study area was in coastal zone and disaster prone. Salinity was one of the biggest huddles in vegetable production. So, both demand and price were high. If government bring some strategic change so that the growers can easily sell their homestead produce directly to the local market without any intermediators will ensure proper price and profit.

- 5) In my study area promoting more the existing cold storage facilities and ensure timely and adequate supply of quality pesticides, insecticides and fertilizers would ensure low-cost production and food security. Government extension service needs strengthen their activities.

8.4 Limitations of The Study

There are some problems and difficulties that the researcher faces during data collection Period. Such as-

- 1) Most respondents did not keep correct written records of cost and returns, so the researcher had to rely solely on the respondent's memory to collect the necessary information.
- 2) Most of the rural women in the study area thought that the researcher was a government officer. So, they initially hesitated to answer the questions related to their income and expenses. Some feared the imposition of new taxes. For that adequate estimation of the data on those details was very difficult for the researcher.
- 3) Most respondents in the study areas had no knowledge about research study. Therefore, it was difficult to explain the purpose of this research to convince them.
- 4) Sometimes, the respondents did not cooperate willingly with the researcher. They found no benefit in giving information to the researcher.
- 5) Due to limited fund, data were collected within shortest possible time.
- 6) To overcome all these problems and obtain accurate information, much patience was required from the researcher.

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