

**FINANCIAL PROFITABILITY OF WINTER
VEGETABLES CULTIVATION IN SOME
SELECTED AREAS OF NARSINGDI DISTRICT**

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VEGETABLES CULTIVATION IN SOME SELECTED
AREAS OF NARSINGDI DISTRICT**

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CERTIFICATE

This is to certify that thesis entitled, “**FINANCIAL PROFITABILITY OF WINTER VEGETABLES CULTIVATION IN SOME SELECTED AREAS OF NARSINGDI 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 BUSINESS ADMINISTRATION**, embodies the result of a piece of *bona fide* research work carried out by **MD. HAFEZUR RAHMAN** bearing Registration No. **11-04548** 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 course of this investigation has duly been acknowledged.

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**DEDICATED TO
MY BELOVED
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ABSTRACT

Vegetables offer a low-cost source of nutrition relative to other food products. Bangladesh's climate and soil are suitable for growing vegetables all year round. This study was conducted in Narsingdi district to assess the financial profitability of vegetables cultivation. A total of 60 vegetable farmers were selected randomly to achieve the objectives of the study. Out of 60 farmers, 21 were small, 26 were medium and 13 were large. A face-to-face interview was conducted during November, 2019 to February, 2020 to collect the necessary information. The farm size was arbitrarily categorized on the basis of the land where vegetables and other crops were grown. Farmers with 0.01-0.33 acres were considered small, 0.34-1.00 acres were considered medium farmers, and those with over 1.00 acres were considered large farmers. Mostly descriptive statistics were used to achieve the objectives. The variable cost per acre of production of brinjal, tomato and country beans were found to be Tk. 74260, 61870 and 66680 respectively, and their corresponding fixed cost was Tk. 13713 and 13094 and 13334, respectively. The gross margin per acre was Tk. 179240, 155630 and 229420 for brinjal, tomato and country bean, respectively. The net return per acre was found to be Tk. 91267, 80666 and 149406 for brinjal, tomato and country bean, respectively. The undiscounted benefit cost ratio was 2.88, 2.90 and 3.70 for brinjal, tomato and country bean, respectively. The vegetable producers in the study areas were facing various problems including inadequate capital, attack of pest and diseases, lack of quality seed, lack of availability of adequate inputs and higher cost of inputs.

CONTENTS

CHAPTER	TITLE	PAGE NO.
	ACKNOWLEDGEMENT	i
	ABSTRACT	ii
	CONTENTS	iii-vi
	LIST OF TABLES	vii
	ABBREVIATIONS AND ACRONYMS	viii
CHAPTER 1	INTRODUCTION	1-7
	1.1 Background	1
	1.2 Vegetables growing patterns in Bangladesh	3
	1.3 Vegetable production in Bangladesh	4
	1.4 Nutritional content of selected vegetables	5
	1.5 Justification of the study	5
	1.6 Key research questions	6
	1.7 Objectives of the study	7
	1.8 Outline of the study	7
CHAPTER 2	REVIEW OF LITERATURE	8-11
	2.1 Introduction	8
	2.2 Review of Existing Literature	8
CHAPTER 3	METHODOLOGY	12-13
	3.1 Introduction	12
	3.2 Selection of the study area	12
	3.3 Selection of samples and sample technique	12
	3.4 Tabulation and analysis of data	13
	3.5 Problems faced in data collection	13
CHAPTER 4	DESCRIPTION OF THE STUDY AREA	15-25
	4.1 Introduction	15
	4.2 Location	15
	4.3 Climate, topography and soil condition	19

4.4 Area and population	19
4.5 Agriculture holding	20
4.6 Agriculture holding	20
4.7 Non-farm holdings	21
4.8 Agriculture work	21
4.9 Area under temporary crops	21
4.10 Area under permanent crops	21
4.11 Livestock	23
4.12 Poultry	23
4.13 Occupations	24
4.14 Transportation, communication and marketing facilities	24
4.15 Concluding remarks	25
CHAPTER 5 DEMOGRAPHIC PROFILE	26-28
5.1 Age distribution	26
5.2 Education level	26
5.3 Family size	27
5.4 Farm size	27
5.5 Farming experience	28
CHAPTER 6 COST AND RETURN	29-31
6.1 Cost of Cultivation	29
6.2 Return	30
CHAPTER 7 THE CONSTRAINTS AND OPPORTUNITIES OF VEGETABLE CULTIVATION	32-33
7.1 Introduction	32
7.2 Problems faced by farmers	32

7.2.1 Higher inputs cost	32
7.2.2 Attack of pest and diseases	32
7.2.3 Inadequate capital	32
7.2.4 Lack of quality seed	33
7.3 Concluding remarks	33
CHAPTER 8 SUMMARY, CONCLUSION AND RECOMMENDATIONS	34-39
8.1 Introduction	34
8.2 Summary	34
8.3 Conclusion	37
8.4 Recommendations	37
8.5 Scope for further study	38
REFERENCES	39

LIST OF TABLES

TABLE	TITLE	PAGE NO.
1.1	Area and Production of Winter Vegetables from 2016-17 to 2018-2019	3
1.2	Cropping pattern of vegetables in Bangladesh	4
1.3	Vegetable production in Bangladesh	5
1.4	Nutrient content of selected vegetables (per 100 gm)	6
4.1	Population Size of Upazila as under the Study Areas	19
4.2	Number of agriculture's holding by tenure (Land area in acre & production in metric ton)	22
4.3	Land area based on utilization (Land area in acre & production in metric ton)	22
4.4	Land area based on utilization (Land area in acre & production in metric ton)	22
4.5	Cropped area (permanent + temporary) sprayed with plant protection measures (Land area in acre)	23
4.6	Number of holding reporting selected livestock species	23
4.7	Number of Selected Poultry/Bird	24
4.8	Literacy (7+) rate of 2001 & 2011	24
5.1	Distribution of the farmers according to their age	26
5.2	Distribution of the farmers according to their education	26
5.3	Distribution of the farmers according to their Family size	27
5.4	Distribution of the farmers according to their Farm size	27
5.5	Distribution of the Vegetable according to their Farming experience	28
6.1	Per acre cost of vegetable cultivation in the study areas	30
6.2	Per hectare costs and returns of producing Brinjal, Tomato, Beans	31
7.1	Production Problem Faced by Farmers in Production of Vegetable	33

ABBREVIATIONS AND ACRONYMS

<i>Arathdar</i>	: Commission Agent
BARI	: Bangladesh Agricultural Research Institute
BBS	: Bangladesh Bureau of Statistic
BCR	: Benefit Cost Ratio
BDT	: Bangladeshi Taka
<i>Bepari</i>	: Small Businessman
BER	: Bangladesh Economic Review
DAE	: Department of Agricultural Extension
<i>et al.</i>	: and others (at elli)
FAO	: Food and Agricultural Organization
<i>Faria</i>	: Local Collector
GDP	: Gross Domestic Product
GM	: Gross Margin
GR	: Gross Return
gm	: Gram
ha	: Hectare
HIES	: Household Income and Expenditure Survey
HYV	: High Yielding Variety
IOC	: Interest on Operating Capital
Kg	: Kilogram
MoP	: Muriate of Potash
mt	: Metric Ton
NGO	: Non-Government Organization
NM	: Net Margin
SMC	: Supply Chain Management
t	: Ton
TC	: Total Cost
TFC	: Total Fixed Cost
Tk.	: Taka
TSP	: Triple Super Phosphate
TVC	: Total Variable Cost
US	: United States
USDA	: United States Department of Agriculture
\$: Dollar

CHAPTER 1

INTRODUCTION

1.1 Background

Vegetable production in Bangladesh is well diversified. Potatoes, onions, chillies, tomatoes, cabbage, cauliflower, carrots, melons, bottle gourd, brinjal, etc. are the key vegetable species grown. Farmers earn higher returns from vegetables compared to other crops (Ali & Hau, 2001; IFPRI, 1998; Borcz, 1992; Singh & Sikha, 1992), and provide micronutrients at a lower unit cost than other micronutrient-rich foods such as livestock (Ali & Tsou, 1997).

The vegetable sub-sector can play an important role in the shortest possible time to solve the problems of poverty and malnutrition from two standpoints, such as economic and nutritional points of view, the significance of vegetables can be realized. Vegetables offer a low-cost source of nutrition relative to other food products. Also, small quantities of land and even homestead areas can be created. It can be grown within a short period of time and within a crop season; more than one crop can be grown. There are a large number of different varieties of vegetables which can be grown throughout the year. The greatest number of vegetables is cultivated in the winter season; in general, vegetables are labor-intensive crops and thus offer considerable promise to generate increased opportunities for rural jobs. Bangladesh's climate and soil are very suitable for growing vegetables all year round.

In addition, in order to take advantage of the opportunities arising from agricultural diversification towards vegetable farming, particularly for smallholder farmers, it is necessary to assess the benefit and income of vegetable growers of various farm sizes and, in particular, of smallholder farmers for whom it is promoted and diversified. However, taking into account the different aspects of vegetable farming and its role in the economic uplifting of the farming community and, in particular, of small farmers, the study is conducted in Narsingdi district to assess the remunerative value of vegetable farming.

Although Bangladesh is on course for middle income country status by 2021, agriculture remains the largest employer in the country by far; and above 45% of the population is directly employed in agriculture and around 70% depends on agriculture in one form or another for their livelihood (BBS 2016). Agriculture is the source of food for people through crops, livestock, fisheries; the source of raw materials for industry, of timber for construction; and a generator of foreign exchange for the country through the export of agricultural commodities, whether raw or processed. It is the motor of the development of the agro-industrial sector including food processing, input production and marketing, and related services. As main source of economic linkages in rural areas, it plays a fundamental role in reducing poverty, which remains a predominantly rural phenomenon. The role of agriculture is also fundamental in promoting nutritious diets, especially in the countryside where production and consumption patterns are closely linked. According to the HIES (2010) 31.2% and 21.1% of the population in rural areas lives below upper and lower poverty line respectively. However, as Bangladesh develops, and other sectors grow (such as readymade garments), the share of agriculture in Gross Domestic Product (GDP) has naturally declined. The provisional estimates show that contribution of the broad agriculture sector to GDP in 2019-20 is 13.32% (BBS 2019). The contributions of crop & horticulture, fishery, animal farming and forestry subsectors in GDP were 9.13%, 11.02%, 9.06% and 14.75% respectively (Source: BBS, Yearbook of Agricultural Statistical, 2019).

Table: 1.1 Area and Production of Winter Vegetables from 2016-17 to 2018-2019

Name of Crops	2016-17		2017-18		2018-19	
	Area (acres)	Production (MT)	Area (acres)	Production (MT)	Area (acres)	Production (MT)
Rabi Brinjal	80195	347541	80618	355862	82206	360421
Cauliflower	48725	277500	48083	274297	49869	284327
Cabbage	45681	311650	45829	321719	47401	331020
Gourd/ Water Gourd	46664	226084	46095	222315	47391	236033
Rabi Pumpkin	42612	190646	41664	191087	43171	205666
Tomato	68366	388725	69509	385038	69697	387653
Radish	65652	280524	63066	284090	64434	308395
Bean	51595	137495	50888	134860	51578	144050
Bengal Spinach (Palongshak)	21598	66292	22873	55609	23672	57616
Red Amarnath (Lalshak)	28463	51664	29403	59150	29277	66694
Carrot	4533	16306	5084	18674	5085	19246
Laushak	15474	25100	16334	28647	16156	26812
Utchee	0	0	0	0	14548	29503
Shalgom	0	0	0	0	2965	7513
Other Winter Vegetables	18615	44412	18687	41003	-	-
	538146	2363939	538133	2372351	547450	2464949

Source: BBS, Yearbook of Agricultural Statistical, 2019

1.2 Vegetables Growing Patterns in Bangladesh

Vegetables are graded as vegetables for the summer / rainy season, vegetables for the winter season and vegetables for all seasons (Table 1.2) depending on the growing seasons. Potato, rabi brinjal, cauliflower, cabbage, tomato, radish bean spinach, bean and carrot, etc. are the vegetables of the winter season. Crops like okra, pumpkin, brinjal kharif, long bean yard, gourd teasel, dhundal, chicinga. Many vegetables are

grown during the year, such as Brinjal, Tomati, Yard Ling Bean Spinach and many leafy vegetables. From May to October, summer vegetables are cultivated during the monsoon season. From November to April, on the other hand, winter vegetables are grown. During the winter (60 to 70 percent) vegetable production is higher and most districts generate marketable during surplus that season.

Table 1.2 Cropping patterns of vegetables in Bangladesh

Seasons	Vegetables
Summer or rainy season	Cultivated during the monsoon season from May to October. okra, pumpkin, kharif brinjal, yard long bean, teasel gourd, dhundal, chicinga
Winter	potato, rabi brinjal, cauliflower, cabbage, tomato, radish bean spinach, bean and carrot
All season	Brinjal, Tomato, Yard ling bean spinach and many leafy vegetables.

Source: Faruqee (1998)

1.3 Vegetable Production in Bangladesh

In 2000-2001 the total land under the vegetable production were estimated at 109716.60 and productions were 188138 metric ton respectively (Table 1.3). The figure shows that the area and production were increasing every year.

Table 1.3 Vegetable productions in Bangladesh

Year	Area (ha)	Production (MT)
2000-2001	109716.60	188138
2001-2002	117813.77	184656
2002-2003	121457.49	200486
2003-2004	123481.78	227571
2004-2005	133603.24	264413
2005-2006	152226.72	240972
2006-2007	236437.25	282065
2007-2008	351672.47	3091561
2008-2009	356062.35	2908487
2009-2010	366767.61	3000433
2010-2011	367718.62	3043450
2011-2012	367671.26	3061154
2012-2013	374438.06	3132850
2013-2014	377238.46	3404949
2014-2015	401236.84	3734155
2015-2016	1005000	3892000
2016-2017	1025000	4075000
2017-2018	1020000	4115000
2018-2019	1072000	4336000

Source: BBS, Yearbook of Agricultural Statistical, 2019

1.4 Nutritional content of selected vegetables

A significant part of living a balanced lifestyle is good nutrition. Diets can help to achieve and maintain a healthier weight, minimize the risk of chronic diseases (such as heart disease and cancer), and improve good health in combination with physical activity. So, before consumption, it is necessary to determine the nutritional status of any food. A good and balanced diet includes foods that are safe and free from infection and harmful substances in the right proportions and combinations. High nutrients such as carbohydrates, protein, fat, calcium, and iron were contained in three vegetables in the yard-long bean. I found more vitamin C in teasel gourds.

Table 1.4 Nutrient content of selected vegetables (per 100 gm)

Nutrition	Vegetables		
	Brinjal	Bean	Tomato
Carbohydrate (gm)	5.70	8.35	6.30
Protein (gm)	0.98	2.80	1.47
Fat (gm)	1.9	0.40	0.1
Calcium (gm)	9	50	9.83
Iron Fe (gm)	0.24	0.47	0.538
Vitamin A (µg or gm)		43 µg	Carotenoid 0.27 mg
Vitamin B (mg)	0.037 (B2) 0.084 (B6)	0.111 (B2) 0.24 (B6)	
Vitamin C (mg)	2.20	18.80	119

Source: Barmon, 2014

1.5 Justification of the study

Changes in agribusiness structures and developments in the agricultural sector of developing countries like Bangladesh provide opportunities for smallholder farmers to commercialize agriculture. However, rapid population growth; continuing economic meltdown and unfavorable impacts of climate change may be accountable for the potential lack of development in the agriculture sector. For both domestic and export markets, vegetables are important. In Bangladesh, almost all households provide vegetables in their diets. Vegetables are nutritionally healthy sources of vitamins, mineral proteins and fiber. Winter vegetable production is a significant source of income for farmers for those in the producing regions. In the past, the production of winter vegetables was mainly subsistence, with a large proportion of the produce consumed by farm households. Vegetables occupy a unique role in Bangladesh's domestic and foreign food trade. This study aims to close this gap by assessing financial profitability of some selected winter vegetables in Bangladesh

1.6 Key Research Questions

- i. What is the production costs some selected vegetables?
- ii. What is the profitability of selected vegetables?

1.7 Objectives of the study:

The specific objectives are:

- i. To know the demographic profile of vegetable growers;
- ii. To estimate the production cost and profitability of selected winter vegetables cultivation;
- iii. To identify the constraints of winter vegetable cultivation in the study area;

1.8 Outline of the Study

The study consists of 8 chapters. Chapter 1 explained introduction of the study. Relevant review of literature is briefly described in chapter 2. Methodology of the study is presented in chapter 3. A brief description of the study area is presented to chapter 4. Demographic profile is at chapter 5. Cost and return can be seen at chapter 6. Chapter 7 determined constraints and opportunities faced by the farmers. Finally, Chapter 8 deals with summary, conclusions and some policy recommendations.

CHAPTER 2

RIVIEW OF LITERATURE

2. 1 Introduction

Assessment of related literatures in any research is necessary in the good judgment that it allows for an extent for reviewing the collection of knowledge & information appropriate to the future research. This knowledge & information give an instruction in designing the potential research problem & validating the new determinations. The aim of this chapter is to review the results of some previous studies, which are related to the present research work. Review of related literature in any research is essential because it provides a scope for knowing the available stock of knowledge relevant to the proposed research. This knowledge provides a guideline in designing the future research problem and validating the new findings. Many researchers have been conducted to vegetable production, profitability in several parts of the world but few literatures are available on value chain and marketing of selected vegetables in Bangladesh. Many studies have been conducted on marketing of different agricultural commodities; a few studies are available on value chain aspects of some selected vegetables in Bangladesh. Nevertheless, some important studies on different aspects directly or indirectly related to the present study such as various types of vegetables production, profitability, price integration, methodological similarities, problems of intermediaries etc. are retrospect. The following section looked back the most common and relevant studies which have been conducted in the past home and aboard.

2.2 Review of Existing Literature

Akter *et al.* (2012) conducted a study on economic analysis of winter vegetables production in some selected areas of Narsingdi district. The study was designed to assess the comparative profitability of selected winter vegetables: namely tomato, cauliflower and cabbage. In total, 90 farmers (30 each growing tomato, cauliflower and cabbage) were randomly selected from two villages under Shibpur Upazila in Narsingdi district. Both tabular and quantitative analyses were done to achieve the major objectives of the study. The major findings of the study revealed that production of all the selected vegetables were profitable. The per hectare gross cost of

production of tomato, cauliflower and cabbage were Tk. 118000, 116977 and 120522, respectively and the corresponding gross returns were Tk. 217020, 210000 and 220000, respectively. The per hectare net returns of producing tomato, cauliflower and cabbage were Tk. 97000, 93023 and 99478, respectively. In other words, all the selected winter vegetables were highly profitable to the farmers. However, the farmers earned the highest profit from cabbage. The revenue type Cobb-Douglas production function analysis indicated that per hectare gross returns were significantly influenced by the use of human labour, tillage, seeds, fertilizers, irrigation and insecticides. These factors were directly or jointly responsible for influencing the per hectare gross returns of tomato, cauliflower and cabbage. The study reported some problems and constraints which are related to production and marketing of these vegetables. Based on the findings of the study, some recommendations were made to improve cultural and management practices for selected winter vegetables farming with a view to increase the income and employment opportunities of the farmers.

Matović *et al.* (2016) conducts a comparative analysis and assess the profitability of potato production under rainfed conditions and with irrigation by these two methods in Serbia. The main outcome of the research showed that higher yields and more profitable production are achievable with irrigation, compared to rainfed conditions. Subsurface drip irrigation was found to be more profitable than sprinkler irrigation. The results provided insight into the structure and distribution of income and expenses, the income and expense growth trend, the percentage profit growth in the case of sprinkler and subsurface drip irrigation, as well as potential income losses at the national level if the irrigation methods considered are not used. A detailed analysis of the production costs provided insight into the feasibility of optimizing potato-growing approaches for all three types of production. The higher profitability of irrigated potato production opens the question of the need to increase irrigation coverage in Serbia.

Aktar (2006) conducted a research on economics of some selected winter vegetables production in an area of Trishal Upazila in Mymensingh District. The selected vegetables were cauliflower, cabbage, bean and bottle gourd. The major findings of the study revealed that all the selected vegetables were profitable.

Ahmed (2001) conducted a study during the period of January to February 2000 on “A Comparative Economics Study of Potato and Cauliflower Production in a Selected Area of Commila District”. The study was undertaken to analyze the comparative profitability of potato and cauliflower production. 60 households were selected of which 30 were potato and 30 were cauliflower farmers. It was estimated that per ha costs of production of potato were (Tk 71860.23 and 59054.31 on full costs and cash costs basis respectively) higher than cauliflower (Tk. 486442.44 and 31708.69 on full costs and cash costs basis respectively). While per ha gross return of potato (Tk. 102761.38) was less than cauliflower (Tk. 486643.60), in case of per ha net return from potato (Tk. 30901.15 and 43707.07 on full costs and cash costs basis respectively) was less than cauliflower (Tk 137843.82 and 154934.91 on full costs and cash basis respectively). Evidence showed that production of cauliflower was more profitable than potato on basis of full costs and cash costs.

Parvin (2008) conducted an economic study of alternative rice and vegetables production in selected area of Mymensingh district. The major findings of the present study were that the alternate rice and vegetables production were profitable from the viewpoint of marginal, small, medium and large farmers. Average family size of all farmers was 5.67 which were relatively higher than national average (4.48). About fifty percent of the household heads of the sampled farmers had some level of education and farming was the main occupation of the farmers. Boro rice, Aman rice, lady’s finger, cabbage, and white gourd were mainly produced in the study areas and per ha net returns of producing these crops were Tk 23581, 3896, 86898, 89640 and 99000, respectively. The farmers earned the highest profit from white gourd vegetables.

Sangeetha and Banumathy (2011) conducted an economic analysis of major vegetables in Cuddalore district of Tamilnadu, India. The result of the regression analysis showed that there was a significant and negative relation between current price and current market arrivals of tomato and brinjal. Market arrivals played an important role in fixing current wholesale price rather than lagged price.

Suraiya (2008) studied on an economic analysis of some selected summer vegetables production in PurbadhalaUpazila of Netrakona District. The selected vegetables are cucumber, okra, white gourd and snake gourd. The major findings of the study

revealed that all the selected vegetables were profitable. Per ha gross cost of production of cucumber, okra, white gourd and snake gourd were Tk 108548.0, 91620.0, 108104.0 and 92157.0, respectively and the corresponding gross return were Tk 202000.0, 162000.0 and 151000.0, respectively. Per ha net returns of producing cucumber, okra, white gourd and snake gourd were Tk 93452.0, 70380.0, 96896.0 and 58843.0, respectively. In other words, all the selected summer vegetables were highly profitable to their farmers. However, the farmers earned the highest profit from white gourd.

Rahman *et al.* (2016) carried out a report on the development of brinjal in the district of Jamalpur. Via profitability analysis and development factors, it was discovered that the production of brinjal is profitable.

Hasan *et al.* (2014) conducted a study on profitability of important summer vegetables in Keranigonj upazila of Bangladesh and found that the cultivation of summer vegetables is beneficial. In addition, they found that the benefit from the production of summer vegetables was higher than that of other competitive crops, such as bottle gourds and cucumbers

Considering the above perspective, the present study has been undertaken. It is expected that the present study will serve as the base for further studies. Moreover, it will contribute to the stock of existing knowledge.

CHAPTER 3

METHODOLOGY

3.1 Introduction

Methodology is the systematic steps of action that include the collection of accurate data as per research goals from the selected sample farmers. It is an important and integral part of any analysis. To a great degree, the reliability of any scientific study depends on the required methodology. In following a scientific and logical approach, the researcher gave a careful account.

3.2 Selection of the Study Area

A significant step for the conduct of any research is the selection of the study area since it implies a premise from which the relevant data will be obtained in accordance with the objectives. Narsingdi district is considered one of the vegetables growing zones in Bangladesh because of the high concentration of vegetable cultivation and processing. Two upazilas were picked from the Narsingdi district, namely Shibpur and Raypura.

The key factors behind the selection of upazila above as research are as follows:

- ② A large number of vegetable growers are available and vegetables are growing well and farmers in these research areas use a large portion of their land to produce vegetables.
- ② These villages had some identical features for vegetable production, such as topography, soil and climatic conditions.
- ② The cooperation of the farmers and intermediaries was highly expected.
- ② Simple connectivity and good facilities for communication in these villages.

The selection of an area that would provide maximum information on the marketing of vegetables in Bangladesh was an absolute necessity. As the study area, Dhaka City was chosen because it would provide maximum information on the marketing of vegetables in Bangladesh.

3.3 Selection of Samples and Sample Technique

3.3.1 Period of the study: Data for the study were collected during the month of November 2019 to February in 2020.

3.3.2 Selection of the sample and sampling techniques: For sample collection, a random sampling technique was applied. 60 farmers were chosen for the analysis by random sampling. Among the 60 farmers 21 were small, 26 were medium and 13 were large. The size of the farm was arbitrarily categorized on the basis of the land where vegetables and other crops are grown. Farmers with 0.01-0.33 acres were considered small, 0.34-1.00 acres were considered medium farmers, and those with over 1.00 acres were considered large farmers.

3.3.3 Sources of Data: The analysis includes data collection from primary sources. The researcher himself gathered the primary data through personal interviews with the respondents. Care and caution have been taken in data collection to achieve data quality and reliability. The researcher made every effort to develop a good relationship with the participants who did not feel hesitant or aggressive to provide the correct details. The aims of the research were explained to each and every owner of the vegetable growers prior to the interview. As a consequence, they were persuaded that the study was solely an academic one and was not likely to have a negative impact on their business.

3.4 Tabulation and Analysis of Data

The completed schedule was scrutinized and reviewed after data collection to prevent irrelevant details. According to the study objectives, the collected data was edited, coded and finally tabulated. In order to mitigate error data, local units (e.g. acres) were obtained and then converted to a standard unit. Finally, the average, percentage and ratio are used to evaluate and condense tabulated results. To achieve the outcome, a list of related tables was prepared.

3.5 Problems Faced in Data Collection

During data collection, the researcher had to face those issues, which are as follows,

- ◆ The investigator had to spend a lot of time explaining the intent and goal of the study to the respondents. Some of the respondents were alarmed to answer the questions as they thought that this knowledge might be used against their interest by the researcher.
- ◆ Due to limited resources, information was obtained within the shortest possible period.

- ◆ Because the essence of the research was exploratory and much of the data was obtained through personal interviews, the exact information was often unable to be recalled by respondents from all categories. Data reliability has created some doubt.
- ◆ Since the researcher was unknown to them, most of the selected respondents initially hesitated to answer the question.
- ◆ The individuals involved were not always available at home or at the supermarket. They were, however, very busy. For this reason, there were regular visits to collect information from them.
- ◆ In view of the whole problem, this study has shed light on some significant vegetable production issues.

CHAPTER 4

DESCRIPTION OF THE STUDY AREA

4.1 Introduction

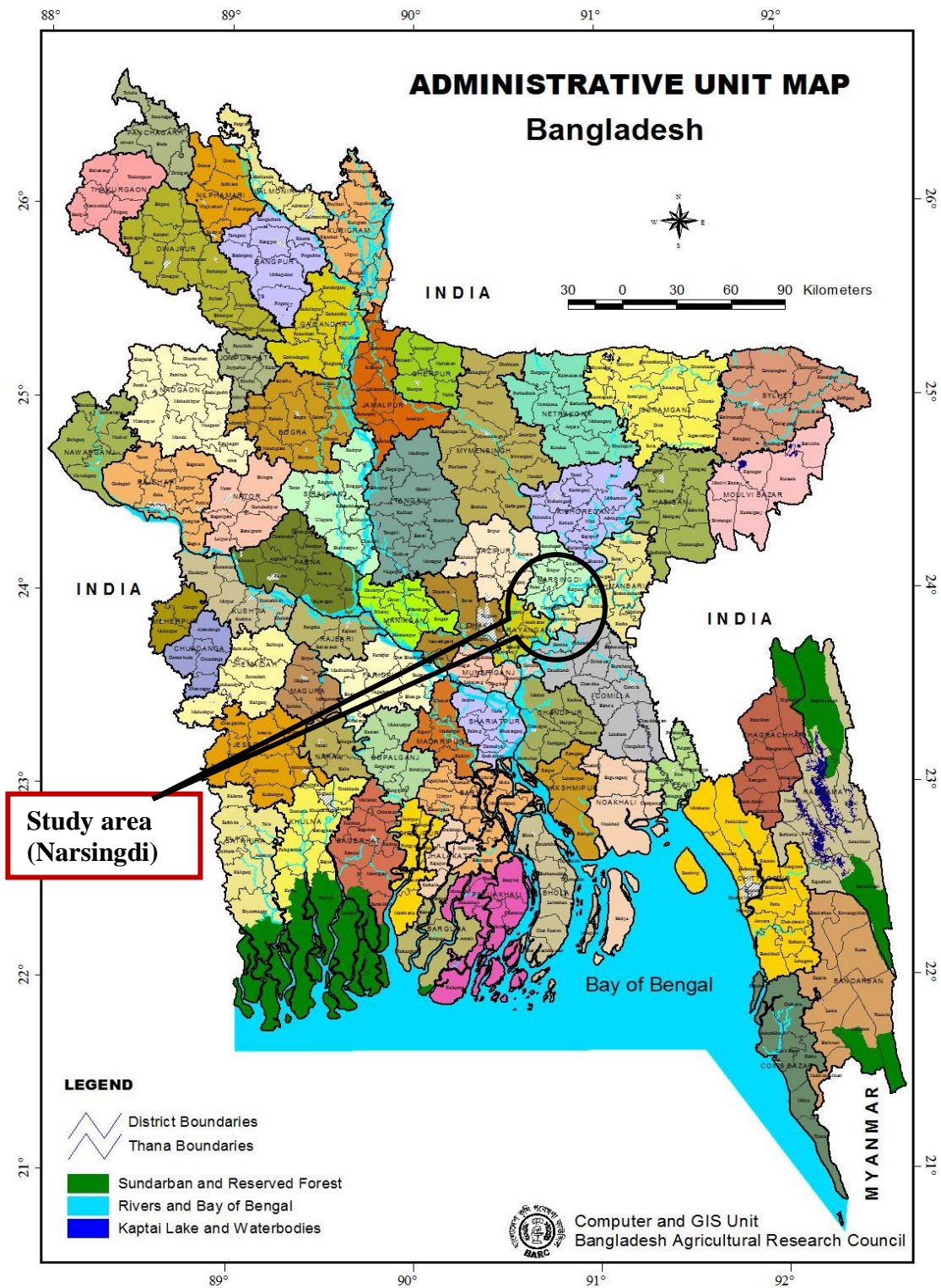
A short description has been presented in this chapter to know the overall features of the study area. It is essential to know the agricultural activities, possible development opportunities and potentials of the study area. Location, area, population, monthly average temperature and rainfall, agriculture, occupation, cropping patterns, communication and marketing facilities of the study area are discussed in this chapter. However, for the production of banana, it is very essential to know the climate and topography of the study areas.

4.2 Location

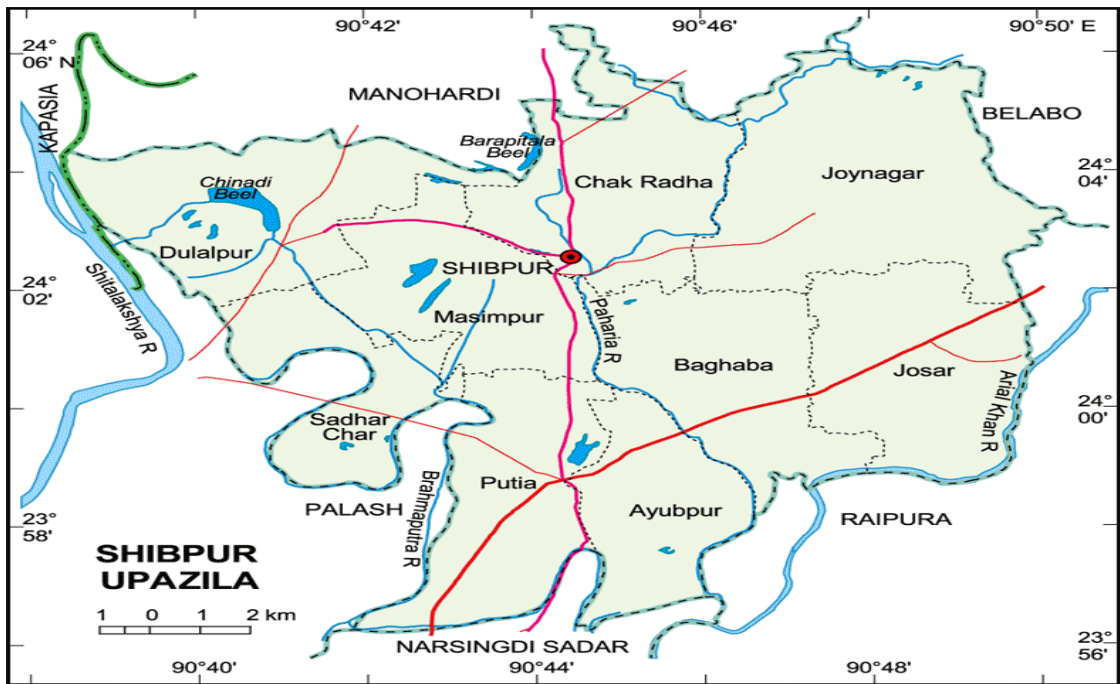
Narsingdi District was previously a sub-division of Dhaka District. It was upgraded to a district in 1984. The popular view on the origin of Narsingdi district name is that about 110 years ago there was lived an influential Zaminadar named Narsingha Paul who was well known to the people for his benevolent activities. The district might have derived its name after the name of that Zamindar. The district is bounded on the north by Kishoreganj District, on the east by Kishoreganj and Brahmanbaria Districts, on the south by Brahmanbaria and Naranyanganj Districts and on the west by the Gazipur District. It lies between 23°29' and 23°45' north latitudes and 90°10' and 90°43' east longitudes. The total area of the district is 1150.13 sq. km.

The selected sample farmers are located in four villages namely Chalak Char, Lebutala, Kanchikata, Shukundi, Dulalpur, Sadhar Char, Putia, Josar under Narsingdi district is considered as one of the leading bananas producing zones in Bangladesh. Two upazilas namely shibpur and Manohordi of Narsingdi district were selected respectively. The locations of the upazila are presented in the Map 4.2 and 4.3 respectively.

Dhaka district was selected as the study area because it would provide maximum information about banana marketing in Bangladesh. The selected of sample *Arathdar* and wholesaler and retailer are located in shibpur bazar, Itakhola bazar and jiniardi bazar. The locations of the area are presented in the Map 4.4.



Map 4.1: Map of Bangladesh



Map 4.2: Map of SHIBPUR Upazila of Narsingdi District



Map 4.3: Map of MANOHARDI Upazila of Narsingdi District



4.3 Climate, Topography and Soil Condition

The climate of the district is relatively mild both in the summer and the winter. The maximum and minimum mean temperatures during the winter vary from 19°C to 23.7°C. During the summer maximum and minimum mean temperatures vary from 26°C to 29°C. The dry winter season starts from November and continues up to the end of February. Summer comes from mid of March and continues up to the mid of June. The rainfall is generally heavy during July and August. Heavy rainfall occurs during the monsoon. Annual average rainfall of this district is 2376 millimeters.

The soil of the district is mainly formed with recent and sub recent alluvial sediments of low parts of the old Brahmaputra floodplain and the new Brahmaputra floodplain. Tract upland soil mixed with the old Brahmaputra floodplain is found in the north eastern part of the District. The central part is formed with the ridges and basins of the Brahmaputra floodplain having grey-clay loam. The soil of the southern part of the District is formed by grey silty complex clay for the young Brahmaputra floodplain. The soil condition of the district is very favorable for producing different types of vegetables and high yielding varieties of crops. Paddy, jute, wheat, sugarcane, vegetables etc. are main crops of this district. Banana, jackfruit, mango, papaya, pineapple, black berry, guava, olive, lotcon, lichi etc. are main crops of this district.

4.4 Area and Population

The total area, population and density of population of the selected upazilas are presented in Table 4.1

4.1. Table

4.1 Population Size of Upazila as under the Study Areas

Upazila	Households	Population (000)			Sex ratio (M/F)	Average size of household	Density Per sq. Km
		Male	Female	Both Sex			
Shibpur	65094	148429	155384	303813	96	4.64	1395
Raypura	63385	131316	143796	275112	91	4.30	1419

Source: BBS, 2017.

4.5 Agriculture holding

An agriculture holding is a techno-economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes without regard to title, legal form or size. Single management may be exercised by either an individual holder or jointly by two or more individuals or holders or by a judicial person such as a corporation, co-operative or government agency. A holding may consist of one or more parcels (fragments of land) located in one or more areas or mauzas or in more than one administrative unit or division provided that all separate parcels of fragments form parts of same technical unit under operational control of same management. The definition covers practically all holdings/households engaged in agricultural production of both crops and livestock. Some agriculture holdings may have no significant agricultural land, e.g. holdings keeping livestock, poultry and hatcheries for which land is not an indispensable input for production.

4.6 Farm holding

A farm holding is defined as being an agricultural production unit having cultivated land equal to or more than 0.05 acres. Farm holdings are classified into following three broad groups:

- (a) Small: Farm holdings having minimum cultivated land 0.05 acre but operated land more than this minimum but up to 2.49 acres.
- (b) Medium: Farm holdings having operated land in between 2.50 to 7.49 acres.
- (c) Large: Farm holdings having operated land 7.50 acres and above.

Small cultivated land 0.04 acre or less is generally used for kitchen garden growing mainly vegetables. Often seeds of white gourd, water gourd, pumpkin and other strains are shown on households; but these creepers spread out around house roofs and other structures. As such, the minimum cultivated land considered for qualifying to be a farm holding is 0.05 acres.

4.7 Non-farm holdings

A non-farm holding is defined as being the one which has neither cultivated non operated land or has cultivated land less than 0.05 acre. Tenancy Owner holdings are those having and operating their owned land and who may or may not be leasing out land.

Tenant holdings are those having no owned land but operating land taken from others on share cropping basis or on other terms. Owner-cum-tenant holdings are those having owned land and who may or may not be leasing out their own land to others and who may be taking land from others on share cropping basis or on other terms.

4.8 Agriculture work

Agriculture work signifies all activities of holder and his/her labor force doing planning, management and operation of a holding. It includes land preparation, sowing, weeding, harvesting, feeding and tending livestock & poultry, kitchen gardening, supervising agricultural workers, keeping farm records & accounts, preparing agriculture products for marketing (including packaging), repairing farm equipment, constructing farm buildings & fences, and engaging in land reclamation and improvement and other related activities. It excludes home and other family domestic chores.

4.9 Area under temporary crops

It is the land area planted to crops having growing cycle or length of life less than one year. These are the temporary crops such as paddy, wheat, jute, cotton, tobacco, sugarcane, pulses, oil seeds, potato, vegetables and other seasonal crops. A list of temporary crops for which data were collected separately was given in back page of "Tally Sheet". The minimum area recorded for a temporary crop was 0.01 acre. Area under temporary crops and temporary-crops net area are equivalents.

4.10 Area under permanent crops

It is the land area planted to crops which remain standing for a long period of time and do not need to be replanted after a seasonal harvest. Mango, jackfruit, coconut, guava, lemon, and other fruit varieties are all permanent crops.

4.10.1 Current fallow

It is land brought into cultivation but left out uncultivated in census year for fertility regaining and improvement or for other reasons.

4.10.2 Net cultivated area

This is land area actually cropped during the census year regardless of number of crops grown plus current fallow. It includes areas under temporary and permanent crops and also current fallow.

4.10.3 Permanent fallow

It is land not available for cultivation due to coming into residence and commercial & other uses. Playground, graveyard, wild shrubs and jungles, marshy land, and the like fall in this category.

Table 4.2 Number of agriculture's holding by tenure (Land area in acre & production in metric ton)

Upazila	Total Farm Holding	Owner Holding	Owner Cum Tenant	Tenant Holding
Shibpur	41361	39376	18616	557
Raypura	37669	43748	14004	2066

Source: BBS, 2017.

Table 4.3 Land area based on utilization (Land area in acre & production in metric ton)

Upazila	Operated area	Permanent Cropped area	Temporary Cropped area	Others
Shibpur	41099	1645	30683	189
Raypura	43712	6160	26471	464

Source: BBS, 2017.

Table 4.4 Land area based on utilization (Land area in acre & production in metric ton)

Upazila	Current fallow	Temporary cropped area					Productivity of Crop
		Single	Double	Triple	Net	Gross	
Shibpur	259	30683	54565	178	259	30683	54565
Raypura	300	26471	43334	164	300	26471	43334

Source: 2017.

Table 4.5 Cropped areas (permanent + temporary) sprayed with plant protection measures (Land area in acre)

Upazila	Total Farm Holding		Reporting Area Sprayed		
	Number	Cropped Area	Number	Cropped Area	
Shibpur	41361	30683	38491	30683	30371
Raypura	41361	30683	38491	30683	30371

Source: BBS, 2017.

4.11 Livestock

Livestock is an integral component of the complex farming system in Bangladesh as it not only a source of meat protein but also a major source of farm power services as well as employment. The livestock sub-sector provides full time employment for 20% of the total population and part-time employment for another 50%. The poultry meat alone contributes a substantial 37% of the total meat production in Bangladesh. The farmers of the study area raise Cows & Buffalo, Goat and Sheep etc.

Table 4.6 Number of holding reporting selected livestock species

Upazila	Cows & Buffalo		Goat		Sheep	
	Holding/ farm number	Animal Number	Holding/ farm number	Goat Number	Holding/ farm number	Sheep Number
Raypura	58549	94840	6175	133780	315	23780
Shibpur	20968	44496	10021	21404	532	1348

Source: BBS, 2017.

4.12 Poultry

The economic system of Bangladesh is mostly dependent on agriculture and agricultural related production. Poultry products like meat and eggs are the main source of animal protein for Bangladeshi people. Chickens are the common and mostly raised poultry birds of Bangladesh. Along with chickens, raising some other

poultry birds like quails, turkeys, ducks, pigeons, peacocks etc. are raised by most of the farmers of the study area.

Table 4.7 Number of Selected Poultry/Bird

Upazila	Hen and cocks		Ducks		Others	
	Holding/ farm number	Total Number	Holding/ farm number	Total Number	Holding/ farm number	Total Number
Raypura	10550	173450	2058	30120	0	0
Shibpur	25875	162088	11142	46134	1742	8856

Source: BBS, 2017.

Table 4.8 Literacy (7+) rate of 2001 & 2011

Upazila	2001			2011		
	Male	Female	Both	Male	Female	Both
Raypura	44.6	40.9	42.7	49.7	50.2	49.9
Shibpur	51.1	47.6	49.3	55.9	55.5	55.7

Source: BBS, 2017.

4.13 Occupations

The major occupations of the peoples under study areas are agriculture, non-agricultural laborer, Wage laborer, industrial laborer, service holder and others. Average wage rate of agricultural labor varies in different areas. Day labors were charged with high wage rate and they became scarce during harvesting period.

4.14 Transportation, Communication and Marketing Facilities

Transportation and communication are the pre-condition for the development of a particular region or a country. The selected areas for the study are well communicated with the different places of Bangladesh. The road network of this area facilitates the local people to market their agricultural as well as other products to the nearby and distance market places. Most of the roads in the study areas are concreted and some of the roads are muddy. Due to well communication with the different markets, usually farmers do not deceive from having good prices of their produced commodities. The modes of transportation of this area are rickshaw, van, bullock carts, truck, by-cycle,

motorcars and boats. There are many hats, which are sit on more than one day in a week and the local bazars are held on every morning and afternoon.

4.15 Concluding Remarks

From the above discussions it is clear that there are some variations in different characteristics between the banana farmers and traders of two upazilas and Narsingdi city. But the magnitude of the variations was not large. There are substantial indications suggesting that banana farmers of both areas were progressive.

CHAPTER 5

DEMOGRAPHIC PROFILE

5.1: Age Distribution

The socio-demographic background and characteristics of the farmer's influences the productions to a great extent. So, a description of the characteristics of farmer is necessary for analyzing the main objective of the present study. Socio-economic characteristics of the farmer's included their age, family size, educational status, farm size, farming experience of the respondent. These are described below:

Table 5.1: Distribution of the farmers according to their age

Age Categories	Vegetable Farmers	
	Number	(Percentage)%
Young (20-35 Years)	29	48.4
Middle (35-50 Years)	17	28.3
Old (Above 50 Years)	14	23.3
Total	60	100

Source: Field survey, 2019

Table 5.1 Shows that age of the Vegetable farmers ranged from 20 to above 50 years. Vegetable farmers were classified into three categories on the basis of their age. Young farmers are mostly engaged in Vegetable cultivation.

5.2: Education Level

Table 5.2: Distribution of the farmers according to their education

Education Categories	Vegetable Farmers	
	Number	(Percentage)%
Illiterate	32	53.3
Primary	13	21.7
Secondary	8	13.3
Higher Secondary	7	11.7
Total	60	100

Source: Field survey, 2019

Table 5.2 Shows that maximum farmers (53.3 %) are illiterate while primary & are (21.7 %). Farmers having secondary education are (13.3%). Vegetable farmers were classified into four categories on the basis of their education. Illiterate farmers are mostly engaged in Vegetable cultivation.

5.3: Family Size

Table 5.3: Distribution of the farmers according to their Family size

Family Size	Vegetable Farmers	
	Number	(Percentage)%
Small (1-4)	21	35
Medium (5-6)	26	43.3
Large (Above 7)	13	21.7
Total	60	100

Source: Field survey, 2019

Table 5.3 & Figure 5.3 Shows the Family size of the Vegetable farmers of the study ranged from 1 to above 7 persons. Vegetable farmers were classified into three categories on the basis of their family size. Vegetable farmers having medium family size (43.3%) are interest in Vegetable cultivation.

5.4: Farm Size

Table 5.4: Distribution of the farmers according to their Farm size

Family Size	Vegetable Farmers	
	Number	(Percentage)%
Small (0.01-0.33 Acre)	22	36.7
Medium (0.34-1.0 Acre)	28	46.7
Large (Above 7 Acre)	10	16.7
Total	60	100

Source: Field survey, 2019

Table 5.4 Shows that Vegetable farmer were classified into three categories on the basis of their farm size. Medium Vegetable farmers were belonging to highest percentage (46.7%).

5.5: Farming Experience

Table 5.5: Distribution of the Vegetable according to their Farming experience

Faming Experience	Vegetable Farmers	
	Number	(Percentage)%
1 – 10 Years	29	48.3
10 - 20 Years	24	40
Above 20 Years	7	11.7
Total	60	100

Source: Field survey, 2019

In Table 5.5 Farming experience of a respondent was determined on the basis of involvement in the farming activities related to vegetable cultivation. Vegetable farmers were classified into three categories on the basis of their Farming experience. Highest portion of the Vegetable farmers (48.3 %) had low farming experience (1 - 10) years.

CHAPTER 6

COST AND RETURN

6.1: Cost of Cultivation

In order to calculate the cost of purchased inputs, prevailing market price was used and for that of home supplied inputs the opportunity cost considered. The bank rate of 10 percent per annum was used to calculate the opportunity cost of operating capital. The most significant factor was overall labor in the cultivation process. For Brinjal, Tomato and Country beans, the average per acre labor needed was TK.42000, TK.38570 and TK.39600 respectively.

Land planning costs were used mostly for land preparation. For the cultivation of Brinjal, Tomato and country beans, the expense was Tk.3500, TK.3450 and TK.3600 respectively. The cost of seed per acre for Brinjal, Tomato and Country beans was Tk.1000, TK.800 and TK.1250 respectively, respectively. A big requirement of the production of Brinjal, Tomato and Country beans is fertilizer. In the study areas, four types of fertilizer were primarily used by farmers, namely Urea, TSP, MP and Gypsum. The cost per acre of these fertilizers has been estimated at Tk.960, TK.650 and TK.1280, respectively. The oil cake cost per acre was estimated at Tk.3000, TK.1050 respectively and TK.3200 respectively. The per-acre cost of cow dung was Tk.8000, TK.6000 and TK.5000 for the production of Brinjal, Tomato and Country Beans. The irrigation water expense per acre amounted to Tk for Brinjal, Tomato and Country Beans TK.2500, TK.2450 and TK.2550, respectively. The cost per acre of miscellany (bamboo, net, etc.) amounted to Tk 3000, TK.2500 and TK.3200, respectively for Brinjal, Tomato and Country beans.

Insecticide costs per acre amounted to Tk.10300, TK.6400 and TK.7000 for the production of Brinjal, Tomato and Country Beans. The cost per acre for land use was Tk.10000 for the production of Brinjal, Tomato and Country Beans in the study region. The interest in operating capital per acre was Tk.3713, TK.3094 and TK.3334, respectively, Brinjal, Tomato and Country Beans

Table 6.1: Per acre cost of vegetable cultivation in the study areas

Cost Head	Brinjal TK.	Tomato TK.	Beans TK.
Land preparation	3500	3450	3600
Seed cost	1000	800	1250
Cow dung cost	8000	6000	5000
Fertilizer (Urea/TSP/MP/Gypsum/Borax)	960	650	1280
Oil Cake	3000	1050	3200
Total Labor cost	42000	38570	39600
Insecticides/Pesticides	10300	6400	7000
Irrigation	2500	2450	2550
Miscellaneous cost (bamboo, net)	3000	2500	3200
Total variable cost	74260	61870	66680
Interest on operating capital	3713	3094	3334
Land value	10000	10000	10000
Total fixed cost	13713	13094	13334
Total cost= (Variable + Fixed) cost	87973	74964	80014

Source: Field survey 2019.

6.2: Return

The variable cost per acre of production of Brinjal, Tomato and Country beans was calculated to be Tk.74260, Tk.61870 and Tk.66680 respectively, and their corresponding fixed cost was Tk. 13713 and Tk.13094, respectively, and 13334. The per acre gross cost of the production of Brinjal, Tomato and Country beans are Tk.118000 Tk.116977 Tk.120522, respectively. The gross margin per acre of

vegetables picked was Tk.179240, Tk.155630 and Tk.229420. Net return of the production of Brinjal, Tomato and Country beans was Tk.91267, Tk.80666 and Tk.149406, respectively, respectively. The undiscounted benefit cost ratio per acre of production of Brinjal, Tomato and Country beans was 2.88, 2.90 and 3.70, respectively.

Table 6.2: Returns of producing Brinjal, Tomato, Beans

Particulars	Brinjal	Tomato	Country Beans
Average yield (M. Ton)	8450	14500	9870
Per unit price (Tk.)/(Kg)	30	15	30
Gross return (Tk.)	253500	217500	296100
Total Variable cost (Tk.)	74260	61870	66680
Total Cost (Tk.)	87973	74964	80014
Gross margin (Tk.)	179240	155630	229420
Net return (Tk.)	91267	80666	149406
BCR (Undiscounted)	2.88	2.90	3.70

Source: Field survey 2019.

CHAPTER 7

THE CONSTRAINTS AND OPPORTUNITIES OF VEGETABLE CULTIVATION

7.1 Introduction

The problems and constraints faced by the respondent farmers and solutions to those problems as suggested by them are discussed here. Constraints and opportunities are discussed below.

7.2 Problems Faced by Farmers

The vegetable producers in the study areas were facing various problems which are broadly classified into production problems. Some of the production problems were inadequate capital, attack of pest and diseases, lack of quality seed, lack of availability of adequate inputs and higher cost of inputs. Marketing problems were related to transportation cost, lower price of vegetable, shortage of marketing facilities etc. There were some major production problems faced by farmer identified according to opinion given by them. Those were as follows:

7.2.1 Higher Inputs Cost

One of the most significant problems faced by producers in their vegetable cultivation has been the high cost of inputs in the study field. Table 6.1 shows that about 85 percent of manufacturers have faced this challenge. Within the production problem faced by the farmer, this problem is marked as the rank-1.

7.2.2 Attack of Pest and Diseases

The problem of pest attacks and diseases has also affected vegetable growers. Attacking pests and diseases decreases crop yield and raises production costs. Table 6.1 indicates that about 82 percent of producers (out of 60 farmers) have been adversely affected by their production of vegetables.

7.2.3 Inadequate Capital

There were capital constraints for the farmers of the study area. A huge amount of cash money was needed for vegetable cultivation to buy different inputs such as human labor, seed, fertilizers, pesticides, etc. Since input requirements were high, the cost of vegetable production was high. Managing the required capital on the part of

the producers was difficult. Table 6.1 shows that about 75% of producers (out of 60 farmers) were confronted with insufficient capital as a production issue.

7.2.4 Lack of Quality Seed

One of the most significant drawbacks of vegetable production in the study area was the lack of quality seeds. Study area farmers said they were tricked by purchasing so-called hybrid seeds from local markets and from seed dealers. As a result, they were given a low vegetable yield. Table 7.1 shows that about 70% of producers (out of 60 farmers) complained that during the vegetable planting season, good quality seeds were not available on the market.

Table 7.1 Production Problem Faced by Farmers in Production of Vegetable

Problem faced by producers	Percent	Rank
Higher input cost	85%	1
Attack of pest and diseases	82%	2
Inadequate capital	75%	3
Lack of quality seed	70%	4

Source: Field Survey, 2019

7.3 Concluding Remarks

The above-mentioned discussions, as well as the findings provided in **Table 7.1** and **Table 7.2**, show that vegetable producers in the study area are currently facing a number of major difficulties in conducting their respective vegetable production and business activities. These are the main constraints in the field of research for vegetable growers. For the sake of improved vegetable production and trade, public and private steps should be taken to minimize or eradicate these problems.

CHAPTER 8

SUMMARY, CONCLUSION AND RECOMMENDATIONS

8.1 Introduction

This chapter focuses on the summary in the light of the discussions made in the earlier chapters. Conclusion has been made on the basis of empirical result. Policy recommendations are drawn for improvement of the existing inefficiency of vegetable production in Bangladesh. Section 8.2 presents a summary of the major findings of the study, conclusion, policy recommendations, limitation of the study and scope for further study are given in Section 8.3, 8.4, 8.5 and 8.6, respectively.

8.2 Summary

Vegetable is one of the world's most important crops grown by small- and large-scale producers alike, with production occurring in more than 130 countries. Agriculture is the backbone of Bangladeshi economy. It accounts for 14.74% of total Bangladeshi GDP and contributes 36% of domestic market share. This survey focuses on vegetable; one of the most important and popular fruits of the country and analyzes the complete value chain (VC) functions, profitability per acre.

Narsingdi district is considered one of the vegetables growing zones in Bangladesh because of the high concentration of vegetable cultivation and processing. Two upazilas were picked from the Narsingdi district, namely Shibpur and Raypura.

The key factors behind the selection of upazil above as research are as follows:

- ② A large number of vegetable growers are available and vegetables are growing well and farmers in these research areas use a large portion of their land to produce vegetables.
- ② These villages had some identical features for vegetable production, such as topography, soil and climatic conditions.
- ② The cooperation of the farmers and intermediaries was highly expected.
- ② Simple connectivity and good facilities for communication in these villages.

The selection of an area that would provide maximum information on the marketing of vegetables in Bangladesh was an absolute necessity. As the study area, Dhaka City

was chosen because it would provide maximum information on the marketing of vegetables in Bangladesh.

Data for the study were collected during the month of November 2019 to February in 2020.

For sample collection, a random sampling technique was applied. 60 farmers were chosen for the analysis by random sampling. 21 were small, 26 were medium and 13 were large among the 60 farmers. The size of the farm was arbitrarily categorized on the basis of the land where vegetables and other crops are grown. Farmers with 0.01-0.33 acres were considered small, 0.34-1.00 acres were considered medium farmers, and those with over 1.00 acres were considered large farmers.

The researcher himself gathered the primary data through personal interviews with the respondents. Care and caution have been taken in data collection to achieve data quality and reliability. The researcher made every effort to develop a good relationship with the participants who did not feel hesitant or aggressive to provide the correct details. The aims of the research were explained to each and every owner of the vegetable growers prior to the interview.

For tabulation purposes, the collected data was scrutinized and summarized using the Statistical Package for Social Sciences (SPSS) and Microsoft Office Excel 2013. In this research, two analysis methods, tabular and statistical, were used. Socio-economic characteristics of vegetable farmers, description of the size of vegetable land, production methods, inputs used and returns of vegetable farmers were included in the tabular technique study. Statistical analysis has been used to demonstrate the influence of the inputs used and other associated vegetable cultivation factors.

Age of the Vegetable farmers ranged from 20 to above 50 years. Vegetable farmers were classified into three categories on the basis of their age. Young farmers are mostly engaged in Vegetable cultivation.

Maximum farmers (53.3 %) are illiterate while primary & higher secondary have same (21.7 %). Farmers having secondary education are (13.3%). Vegetable farmers were classified into four categories on the basis of their education. Illiterate farmers are mostly engaged in Vegetable cultivation.

Family size of the Vegetable farmers of the study ranged from 1 to above 7 persons. Vegetable farmers were classified into three categories on the basis of their family size. Vegetable farmers having medium family size (43.3%) are interest in Vegetable cultivation.

Vegetable farmer were classified into three categories on the basis of their farm size. Medium Vegetable farmers were belonging to highest percentage (46.7%).

Farming experience of a respondent was determined on the basis of involvement in the farming activities related to vegetable cultivation. Vegetable farmers were classified into three categories on the basis of their Farming experience. Highest portion of the Vegetable farmers (48.3 %) had low farming experience (1 - 10).

In order to calculate the cost of purchased inputs, prevailing market price was used and for that of home supplied inputs the opportunity cost considered. The bank rate of 10 percent per annum was used to calculate the opportunity cost of operating capital. The most significant factor was overall labor in the manufacturing process. For Brinjal, Tomato and Country beans, the average per acre labor needed was 42000, 38570 and 39600 TK. respectively, respectively. Tk. was the per acre cost of human labor for tomatoes, cauliflower and cabbage 61320, 53400 and 56040 respectively.

Land planning costs were used mostly for land preparation. For the cultivation of Brinjal, Tomato and country beans, the expense was Tk. 3500, 3450 and 3600 respectively, respectively. The cost of seed per acre for Brinjal, Tomato and Country beans was Tk. 1000, 800 and 1250 respectively, respectively. A big requirement of the production of Brinjal, Tomato and Country beans is fertilizer. In the study areas, four types of fertilizer were primarily used by farmers, namely Urea, TSP, MP and Gypsum. The cost per acre of these fertilizers has been estimated at Tk. 960, 650 and 1280, respectively. The oil cake cost per acre was estimated at Tk. 3000,1050 respectively and 3200 respectively. The per-acre cost of cow dung was Tk. 8000, 6000 and 5000 for the production of Brinjal, Tomato and Country Beans. The irrigation water expense per acre amounted to Tk. for Brinjal, Tomato and Country Beans, 2500, 2450 and 2550 respectively. The cost per acre of miscellany (bamboo, net, etc.) amounted to Tk. 3000, 2500 and 3200, respectively for Brinjal, Tomato and Country beans.

Insecticide costs per acre amounted to Tk. 10300, 6400 and 7000 for the production of Brinjal, Tomato and Country Beans. The cost per acre for land use was Tk. 10000 for

the production of Brinjal, Tomato and Country Beans in the study region. The interest in operating capital per acre was Tk. 3713, 3094 and 3334, respectively, Brinjal, Tomato and Country Beans.

The variable cost per acre of production of Brinjal, Tomato and Country beans was calculated to be 74260, 61870 and 66680 respectively, and their corresponding fixed cost was Tk. 13713 and 13094, respectively, and 13334. Per acre gross cost of the production of Brinjal, Tomato and Country beans was Tk. Tk. 118000 116977 as well as Tk. 120522 respectively. The gross margin per acre of vegetables picked was Tk. 179240, 155630 and 229420, respectively. Per acre net return of the production of Brinjal, Tomato and Country beans was Tk. 91267, 80666 and 149406, respectively, respectively. The undiscounted profit cost ratio per acre of production of Brinjal, Tomato and Country beans was 2.88, 2.90 and 3.70, respectively.

The vegetable producers in the study areas were facing various problems which are broadly classified into production problems and marketing problems. Some of the production problems were inadequate capital, attack of pest and diseases, lack of quality seed, lack of availability of adequate inputs and higher cost of inputs. Marketing problems were related to transportation cost, lower price of vegetable, shortage of marketing facilities etc.

8.3 Conclusion

Vegetables are widely cultivated in the Shibpur and Raypura upazilla of Narsingdi district. Vegetable production was, however, more productive than any other crops. Based on the results it can be concluded that vegetables cultivation is profitable. However, there is considerable scope to improve vegetable productivity. Expanded cultivation of vegetables will increase the standard of living. Production of crops like vegetables can play a crucial role in meeting farmers' cash needs in the context of income generation and poverty alleviation.

8.4 Recommendations

It was evident on the basis of the study's findings that vegetables were productive enterprises and could generate income earnings and job opportunities for Bangladesh's rural people. But some problems and constraints were revealed in order to achieve the goals listed above. Therefore, policy makers should take the requisite steps.

On the basis of the findings of the study, the following specific recommendation may be made for the development of vegetable sector.

- a) Operating capital is a concern for resource-poor farmers in the area of research. An institutional credit program targeted primarily at small and medium-sized farmers should be initiated. A commercial bank should be encouraged to provide loans at low interest rates in order to allow farmers to operate on a commercial basis.
- b) Since vegetables are a productive business, institutions of government and concern should have an effective extension program to expand their area and development.
- c) Cropping patterns based on vegetables should be created and disseminated to those areas of Bangladesh where their development is acceptable.
- d) The Government should take the necessary steps to reduce the prices of inputs which have a major positive impact on yield. The net advantage of vegetable growers will be increased.
- e) During harvesting or just after harvesting, vegetable farmers had to sell their goods at low prices. A suitable storage scheme should be built so that farmers are not forced to sell their goods during the harvest period at low prices.

8.5 Scope for Further Study

Although the aim of the present study is to provide some useful information for the guidance of farmers, traders, policy makers and researchers, it is not free of criticism. This research could not cover certain significant areas due to limited time and money. Of course, the limitations of the current study open avenues for further studies, which are given below:

- a) For better understanding, a broad-based analysis in this field may be undertaken not only to analysis the relative profitability of vegetables, but also with other crops.
- b) A further analysis can be carried out by taking into account the difference in seasonal prices and the post-harvest depletion of vegetables in the various value chains.
- c) Studies of other vegetable varieties can be carried out individually to determine their comparative profitability.

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