VEGETABLE MARKETING PROBLEMS FACED BY THE FARMERS IN CHIRIRBANDAR UPAZILA UNDER DINAJPUR DISTRICT

A Thesis By

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MASTER OF SCIENCE IN AGRICULTURAL EXTENSION AND INFORMATION SYSTEM

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CERTIFICATE

This is to certify that the thesis entitled, **"VEGETABLE MARKETING PROBLEMS FACED BY THE FARMERS IN CHIRIRBANDAR UPAZILA UNDER DINAJPUR DISTRICT"** submitted to the Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **Master of Science in Agricultural Extension and Information System,** embodies the result of a piece of bona fide research work carried out by SIRAJUM MUNIRA MIM Registration No. **19-10031** 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, received during the course of this investigation has duly been acknowledged.

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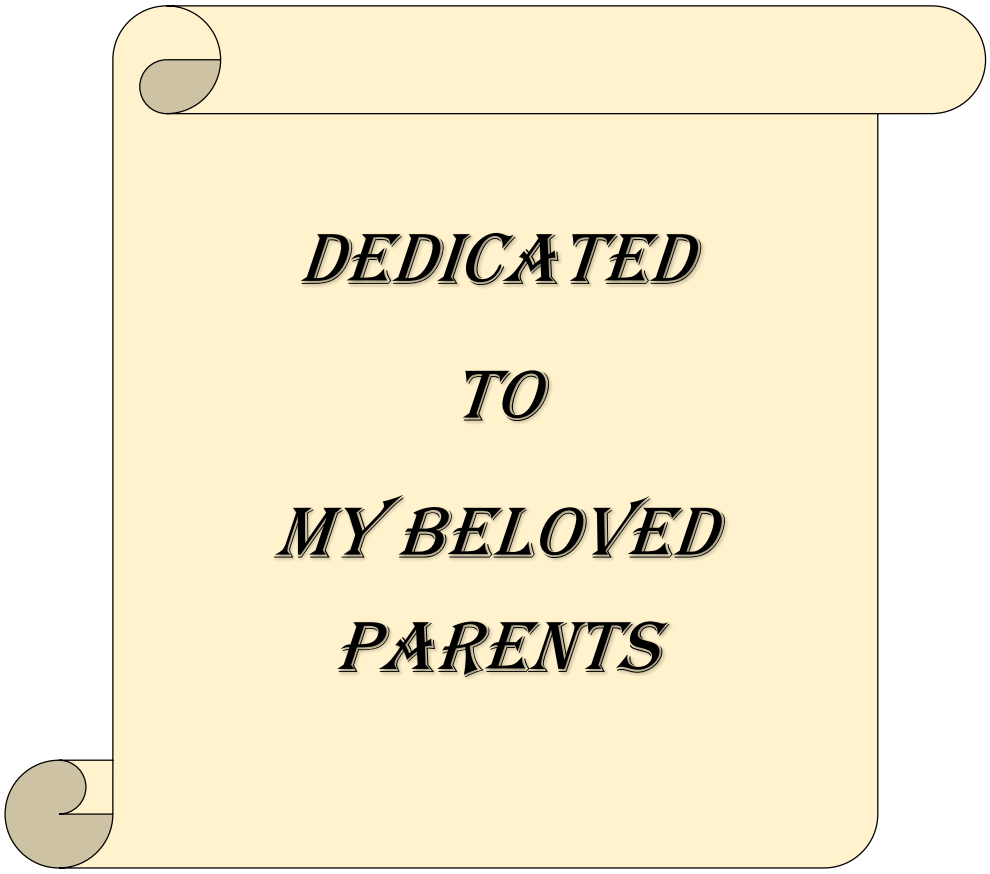
DEDICATED
TO
MY BELOVED
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The Author

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VEGETABLE MARKETING PROBLEMS FACED BY THE FARMERS IN CHIRIRBANDAR UPAZILA UNDER DINAJPUR DISTRICT

Sirajum Munira Mim

Abstract

Farmers of Bangladesh faced multifaceted problems in vegetables marketing. Therefore, the objectives of the study were to describe the selected characteristics of farmers engaged in vegetable marketing, to determine the extent of the problems faced by the farmers and to explore the contribution of farmers selected characteristics to their extent of problems faced in vegetable marketing. Data were collected from 133 vegetable farmers using a structured interview schedule and analyzed by multiple regression. The results indicated that majority (63.9 percent) of the respondents faced medium problems followed by 20.3 and 15.8 percent had low and high marketing problems, respectively. Among eleven characteristics, vegetable cultivation experience, extension contact, use of modern communication device and knowledge on vegetable marketing had significant negative contribution to their problems faced while rest of the seven characteristics i.e., educational qualification, farm size, farm size under vegetable cultivation, annual family income, income from vegetable marketing, credit availability and duration of training had no significant contribution to their problems faced in vegetable marketing. The Problems Faced Index (PFI) showed that 'lack of pucca road' was ranked the most prominent problem followed by 'road blockade due to land slide' was ranked the second while 'misleading information' was ranked the last. Therefore development of better infrastructure in the form of transportation facilities, storage facilities and availability of marketing information are vital for commercialization of vegetables.

CHAPTER I

INTRODUCTION

1.1 General Background

Vegetables abundantly grow in most parts of Bangladesh. Bangladesh made splendid success in vegetable production. Vegetable production can be an important alternative to generate income and ensure malnutrition. In Bangladesh, on average, one consumes 120 gm. of vegetables daily. However, each adult requires 300 gm. of vegetables daily for a balanced diet. The actual per capita consumption of vegetables is far below the requirement. Vegetables are rich sources of essential vitamins such as A, C, niacin, riboflavin, thiamin, and minerals such as calcium and iron. They contribute to the intake of essential nutrients from other foods by making them more palatable. They provide the dietary fiber necessary for digestion and health and are essential for maintaining health and curing nutritional disorders (Terry and Leon, 2011). Vegetable production offers a promising economic opportunity for reducing rural poverty and unemployment in developing countries and is a key component of farm diversification strategies.

Vegetables are grown worldwide in almost 200 countries. A world vegetable survey indicated 392 vegetables were cultivated worldwide, representing 70 families and 225 genera (Kays and Dias, 1995). More than 60 different types of vegetables of indigenous and exotic origin are grown in Bangladesh. Most of the vegetables are marketed fresh with a small portion processed. Almost three-fourths of the world's production of vegetables occurs in Asia. Bangladesh holds the third position after China and India in terms of producing vegetables, according to the United Nations World Food and Agriculture Organization (FAO, 2019). Many vegetables are grown in Rajshahi, Jashore, Rangpur, Dinajpur and Jamalpur districts. Some of the most grown vegetables in Bangladesh include potatoes, tomatoes, cabbages, cauliflowers, water gourds, pointed gourds, ridge gourds, bitter gourds, pumpkins, lady's fingers, cucumbers, beans, carrots, etc. Vegetable contributes 3.68% to the GDP with a production area of less than 2.63 of the total cropped area.

The development of Bangladesh depends largely on the development of the agriculture sector, which contributes 13.4 percent of the GDP (BBS, 2021). About 70 percent of the total population lives in rural areas and directly or indirectly depends on agriculture

for their livelihood. Bangladesh could not fully catch the benefit of the green revolution in cereal production to substantially alleviate poverty and malnutrition (Karim, Rahman and Alam, 2009). So, the government of Bangladesh has been trying to depart from rice-led growth to several non-rice crops production bases (Hoque, 2000). Switching to year-round vegetable production can be an important alternative to generate incomes which eventually can play an important role in alleviating poverty. Farmers are commercially cultivating crops, especially vegetables. During the last decade, both area and production of vegetables increased in manifolds (AIS, 2001 and 2011). Around 60-70 percent of vegetables are produced in winter, and most districts have a marketable surplus during this season (Weinberger and Genova, 2005). Potato, tomato, brinjal, cabbage, cauliflower, gourds, spinach, beans, radish, carrot, cucurbits and plantains are important vegetables grown all over Bangladesh.

Successful commercial fresh vegetable production is a demanding task that requires a combination of production and marketing skills from the growers. This is a consequence of the special attributes of fresh produce. For instance, the perishability of fresh vegetables leads to fewer storage opportunities than other agronomic crops. As a result, growers are compelled to accept the market price close to their harvesting period. Furthermore, traditional risk mitigation options (i.e., future markets) do not exist for fresh vegetables. Thus, growers are more vulnerable to market fluctuations. Farmers need to operate in a changing market environment with greater demand for more varieties and quality (Dimitri et al., 2003). If the vegetable produced does not meet the required standards, then the grower has to sell it at a lower price or not at all.

Agricultural marketing is an essential tool for an uninterrupted, adequate and timely supply of agricultural products, inputs and services to target groups, including producers, consumers and intermediaries. Agricultural marketing is not just a means of distributing agricultural products but also stimulating new forms of production (Mahmud et al., 2000). Agricultural marketing involves moving an agricultural product from the farm to the consumer. A large number of related activities are planning, production, growing and harvesting, grading, packaging, transport, storage, distribution and sale (Sultana, 2012).

The vegetable sector occupies a more or less significant position in our export sector, helps meet our need for foreign currency, and ensures our economic development.

Bangladesh earned one thousand twenty-eight million Taka in 2019-2020 by exporting vegetables.

It is evident that without an efficient agricultural marketing system, high crop production cannot be sustained for a long time. When the farmers do not get a fair price for their products, they must lose their interest to continue farming as a financial crisis. Vegetables often require an intensive input regime, necessitating large labor input in planting and harvesting. In Bangladesh, higher profit variability in the commercial cultivation of vegetables is evident due to variability in yields and market prices (Weinberger and Genova, 2005).

Several factors obstruct the farmers from getting a fair price for their products. These are transportation problems, lack of storage, the low marketable surplus of agricultural goods, a long chain of middlemen, lack of market information, and malpractices in the market. Farmers are compelled to sell their products at the harvest when the prices are minimal, resulting in a very low return for their produced products. Ultimately, the farmers who produce and bear the risks associated with crop production are deprived of the major benefits of their products (Faruqe, 2005). Therefore, identifying the constraints on the expansion of vegetable production and marketing is important since the supply of vegetables is quite irregular in most Asian countries, including Bangladesh (Ali, 2000). It is reported that farmers are not getting the expected benefit from their investment due to various problems. Moreover, problems vary from one farmer to another due to the influence of multiple factors (Rahman et al., 2008-10).

The researcher intended to attempt to understand how vegetable farmers encounter marketing problems. The vegetable marketing system is problematic and unorganized in Bangladesh, which needs to be developed for the well-being of the common people. In most cases, solutions to existing problems in vegetable marketing require using available information and applying available efforts at the appropriate scale and trying as much as possible to increase the efforts to be more effective. Also, overcoming socio-economic constraints is essential to achieving the goal of reducing marketing problems. Conclusively, reductions of marketing constraints to the bare minimum continue to be of utmost importance to the aspiration of the country to attain and sustain national food security.

1.2 Statement of the Problem

Unlike cereals, the marketing of horticultural crops, in general; and vegetables and fruits, in particular, is more complex and risky because of the special characteristics like highly perishable nature, seasonality, bulkiness, etc. and needs special care and immediate disposable (Gandhi and Namboodiri, 2002). As a result, the supply of vegetables is subjected to various problems, including wide fluctuation in prices. The marketing situation of vegetables is still evolving, characterized by supply and demand influences and price realization.

From the above discussion and the background information, the present study has been undertaken with the following research questions:

i. What are the selected characteristics of the farmers engaged in vegetable cultivation?
ii. To what extent do vegetable farmers face problems in the marketing of vegetables?
iii. To what extent do vegetable selected characteristics of farmers influence the extent of problems faced in marketing vegetables?
iv. What are the key problems that farmers faced in marketing vegetables?

The marketing of vegetable crops has been generally acknowledged. But, little research has been directed toward the problem analysis of the marketing of vegetables. Therefore, it is interesting to understand the problems and prospects of marketing vegetables; and to contribute a scientific base for viable policies and strategies aiming at the sustainable development of vegetable marketing in the country.

1.3 Specific Objectives of the Study

From the above viewpoints, the present study takes an attempt to depict the following objectives:

i. To describe the selected characteristics of the farmers engaged in vegetable marketing. The characteristics include:
    a. Educational qualification
    b. Farm size
    c. Farm size under vegetable cultivation
    d. Vegetable cultivation experience
    e. Annual family income

f. Income from vegetable marketing
g. Credit availability
h. Extension contact
i. Duration of training in vegetable marketing
j. Use of modern communication device
k. Knowledge of vegetable marketing

ii. To determine the extent of the problems faced by the farmers in vegetable marketing,

iii. To explore the contribution of farmers' selected characteristics to the extent of problems faced in vegetable marketing,

iv. To index the problems faced by the farmers in vegetable marketing.

1.4 Scope or Rationale of the Study

- The present study was designed to understand the marketing problems of vegetable farmers and to explore the contribution of the farmers' selected characteristics.
- The study findings will, in particular, apply to the study area at Abdulpur union and Auliapukur union under Chirirbandar upazila of Dinajpur District. The findings may also be applicable to other areas of Bangladesh where socio-cultural, psychological, and economic situations do not differ much from those of the study area.
- The findings of the study may also be helpful to the field works of agricultural marketing service providers to improve strategies of action for adopting vegetable marketing.
- The findings of the study will be helpful to accelerate the development in agriculture, farmers' logistic support, information needs and the way of dissemination especially turned to key role players in the society, as well as reducing the marketing constraints of the vegetable farmers. The findings might also be helpful to planners, policymakers, and extension workers.
- To the academicians, it may help in further conceptualizing the systems model for analyzing the problems of vegetable farmers. In addition, the findings of this study may have other empirical evidence for all aspects of marketing problems faced by vegetable farmers which may be used to build an adequate theory of marketing activities.

1.5 Justification of the Study

Problems regarding vegetable marketing are a critical issue for vegetable farmers. Vegetable production in Dinajpur district is mainly through irrigation, ponds, shallow wall. On the one hand, the nature of the vegetable and the lack of an organized market system have resulted in low producers' prices. There are marketing problems challenging vegetable marketing in the District. These are lack of transport, storage, post-handling facilities, and an organized market system from the marketing side (DAE, 2011). A number of technological, institutional, organizational and political factors influence market chain competitiveness. So information on factors that affect the competitiveness of the vegetable market is essential for designing any strategy or policy with an objective of intervention. Due to the problems, vegetable marketing is in a tremendous situation all over Bangladesh. The present study was designed to understand the farmers' problems regarding vegetable marketing and to explore the contribution of their selected characteristics. In Bangladesh, different government and non-government organizations (NGOs) are currently allocating resources for production and problems oriented research, encouraging the rural people to cultivate vegetables, and sell this at the proper rate.

1.6 Assumptions of the Study

The researcher had considered the following assumption while undertaking the study:

- The respondents included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.
- The responses furnished by the respondents were reliable and valid. They express the truth while passing their opinions and providing information.
- The researcher was well adjusted to the social and cultural environment of the study area. Hence, the collected data from the respondents were free from favoritism.
- The views and opinions furnished by the vegetable farmers included in the sample were the representative views and opinions of all the vegetable growers of the study.
- Data were normally and independently distributed with their means and standard deviation.

- The study findings will have general applications to other parts of the country with similar personal, socio-economic and cultural conditions.

1.7 Limitations of the Study

The study was undertaken to have an understanding of the problems faced by the farmers regarding vegetable marketing. Considering the time, respondents, communication facilities and other necessary resources and to make the study manageable and meaningful, it became necessary to impose certain limitations below:

- The study was confined to Chirirbandar upazila under Dinajpur District.
- There were many characteristics of the farmers in the study area, but only11 of them were selected for investigation.
- For information about the study, the researcher depended on the data furnished by the selected respondents during data collection.
- For some cases, the researcher faced unexpected interference from the over interested side-talkers while collecting data from the target populations. However, the researcher tried to overcome the problem as far as possible with sufficient tact and skill.

1.8 Definition of Terms

Respondents (Farmer): Randomly selected people considered to be representable of the population are known as respondents. They are the people from whom a social research worker usually gets the most data required for his research. In this study, the respondents were the village level, vegetable farmers. The person who was involved in farming activities is called farmer.

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

Farm size means the total area of land on which a farmer's family carried on farming operations in terms of full benefit to the family.

Farm size under vegetable cultivation: Farm size under vegetable cultivation refers to the area of land under his/her management only for vegetable cultivation. The area was estimated in terms of full benefit to farmers or his/her family.

Vegetable cultivation experience: Experience as a general concept comprises knowledge or skill of something or some event gained through involvement in or exposure to that thing or event. Experience refers to the nature of the events someone or something has undergone. Experience is what is happening to us all the time - as long we exist. However, in this study, it was considered the year starting from first vegetable cultivation till the year of data collection.

Annual family income: Annual family income refers to the total financial returns of a respondent and the members of his family from agricultural and non-agricultural sources (business, services, daily labor, etc.) during the previous year.

Income from vegetable marketing: Income from vegetable marketing refers to the earnings of a respondent and the members of his family from vegetable marketing during the previous year.

Credit availability: Credit availability of a respondent was measured in ‘000’ BDT based on the total yearly availability of credit from different sources by the respondent himself and other family members (Appendix-A).

Extension contact: It refers to an individual (farmer) exposure to or contact with various personalities (SAAO, UAO, DAE) being used to disseminate new technologies and agricultural information.

Duration of training on vegetable marketing: Duration of training on vegetable marketing of a farmer was defined as the number of day she /he had received training. It was used to refer to the completion of activity by the farmer which the government offered, semi-govt. or non-government organizations to improve the knowledge & skills of farmers and change the attitude of a farmer toward doing a specific job properly.

Use of modern communication devices: It refers to the extent of contact with various communication media (mobile, TV, radio, etc.) by the farmers in receiving agricultural information.

Knowledge of vegetable marketing: Knowledge of vegetable marketing is the basic understanding of the vegetable farmers related to production, management, marketing, processing, grading and processing, and quality controlling of vegetables.

Marketing information: Marketing information means the different information like demand, supply and price of specific products (vegetables).

Marketing: Marketing is the process of handing goods or products from growers to consumers directly or through some channels.

Vegetable: The term vegetable, in this study, refers to the edible parts of plants (root, stem, leaf, fruit, etc.), which are eaten as cooked food or green salad.

Vegetable cultivation: Vegetable cultivation includes the different steps of vegetable production, harvesting, processing, conservation and marketing of vegetables.

Problems: Problems are the elements that hinder/resist/oppose doing some activities or operations in a certain field. The problems in marketing are those which act as the barriers of the market the producer to the potential customers or consumers.

CHAPTER II

REVIEW OF LITERATURE

Review of the literature gives a clear and concise direction for the researcher. This Chapter discusses the review of literature relevant to the objectives of the study. This is mainly concerned with the problems faced by the farmers in vegetable marketing. Researchers addressed various aspects of the importance of vegetables in human health as well as its marketing problems. The first section contains an overview of vegetable cultivation in Bangladesh with its economic contribution and problems. The second section is concerned with the review of past studies related to problems faced by the farmers in different agricultural products. The third section is concerned with the selected characteristics of the farmers that influence the vegetable marketing problems and the last section deals with the conceptual framework of the study.

2.1 Vegetable Cultivation in Bangladesh

2.1.1 Concept of vegetables

The term vegetable, in its broadest sense, refers to any plant part or product primarily used as human food. It refers to the fresh, edible portion of an herbaceous plant consumed in either raw or cooked form. The edible part may be a root (beet, sweet potato, carrot), tuber (potato, taro), bulb (onion, garlic), seed (pea) etc. Vegetables are vital to the general good health of human beings, providing essential vitamins and minerals, dietary fiber, and phytochemicals and reducing the risk of dangerous diseases and other medical conditions.

Vegetables are rich sources of essential vitamins such as A, C, niacin, riboflavin, thiamin, and minerals such as calcium and iron. Virtually all the more important vegetables were cultivated among the ancient civilizations of the Old or the New World and have long been noted for their nutritional importance. Most fresh vegetables are low in calories and have a water content over 70 percent, with only about 3.5 percent protein and less than 1 percent fat. Vegetables are good sources of minerals, especially calcium and iron, and vitamins, principally A and C. Nearly all vegetables are rich in dietary fiber and antioxidants. They contribute to the intake of essential nutrients from other foods by making them more palatable.

2.1.2 Concept of vegetable cultivation and marketing

Vegetable cultivation is the growing of vegetables for human consumption. The practice probably started in several parts of the world over ten thousand years ago, with families growing vegetables for their own consumption or to trade locally. Vegetables are cultivated in only 1.8 percent of the total cultivatable land (BBS, 2017).

The World Vegetable Center (World Veg) is an international public research organization focused exclusively on expanding vegetable production and promoting increased consumption of vegetables. Founded in 1971 by several East and Southeast Asian countries, the United States and the Asian Development Bank as the Asian Vegetable Research and Development Center (AVRDC), the Center now works across Asia and Africa. World Veg has a long history of conserving vegetable germplasm, successful breeding of both global and indigenous vegetables, and developing production technologies. This supports the growth of vegetables on an intensification gradient from home gardens aimed at family nutrition to intensive market-oriented vegetable farming at scale.

Agricultural marketing is a process that starts with a decision to produce a saleable farm commodity and involves all the aspects of the market structure or system- both financial and institutional, based on technical and economic considerations. It includes pre-and post-harvest operations, assembling, grading, storage, transportation and distribution (National Commission on Agriculture, 1976). Marketing can be done locally in farmers' markets, traditional markets, or pick-your-own operations, or farmers can contract their whole crops to wholesalers, canners, or retailers. Marketing is the sum of activities involved in directing the flow of goods and services from producers to consumers. Vegetable markets provide healthier food items that are fresher than those available in supermarkets. The vendors directly come and sell in almost every neighborhood. So, it is convenient for nearly everybody everywhere. Marketing’s principal function is to promote and facilitate exchange. Through marketing, individuals and groups obtain what they need and want by exchanging products and services with other parties.

Increased access to domestic, regional and international markets for vegetables can provide important income incentives for farmers to enter vegetable production, as, for instance, shown by Muriithi and Matz (2015) for Kenya.

Many developing countries have also seen a transformation of traditional value chains related to the growth of modern retail, such as supermarkets (Reardon et al., 2003). If well-managed, this can benefit both consumers and farmers. However, it requires upgrading farmers' skills to use new technologies, contracting, and investing in equipment and infrastructure to meet the demands for quality, consistency, and volume of modern retail. Indonesia, Reardon, and Gulati (2008) noted that the net profit of tomato farmers supplying supermarket channels was 33–39% higher than of farmers supplying traditional markets. Chege et al. (2015) showed that supplying vegetables in supermarkets increased incomes and households' micronutrient consumption in Kenya.

Vegetable marketing is influenced by several factors that can be attributed to production, product, and market characteristics. Kohl and Uhl (1985) identified the following attributes:

Perishability: As vegetables are highly perishable, they lose their quality right after harvest and continue throughout the process until they are consumed. For this purpose, elaborated and extensive marketing channels, facilities and equipment are vital.

This behavior of vegetables exposed the commodity not to be held for long periods and fresh produce from one area is often sent to distant markets without a firm buyer or price. Prices may be negotiated while the commodities are en route, frequently diverting from their original destination for a better price. Sellers might have little market power in determining a price. As a result, a great deal of trust and informal agreements are involved in marketing fresh vegetables. The urgent, informal marketing processes often lead to disputes between buyers and sellers of fresh fruits and vegetables. Producers are normally price takers and are frequently exposed to cheating by any intermediary.

Price/Quantity Risks: Due to the perishable nature and biological nature of the production process, there is difficult to schedule the supply of vegetables to market demand. The crops are subjected to high price and quantity risks with changing consumer demands and production conditions. Unusual production, harvesting weather, or a major crop disease can badly influence the marketing system. While the food-marketing system demands stable price and supply, a number of marketing arrangements like contract farming provide stability.

Seasonality: Vegetables have seasonal production directly influencing their marketing. Normally they have a limited period of harvest and more or less a year round demand.

In fact, in some cases, the cultural and religious setup of the society also renders demand to be seasonal. A lack of facilities to store also worsens this seasonality.

Product bulkiness: Since water is the major component of the product, it makes them bulky and low value per unit that is expensive to transport in new form every time. This, therefore, exposed farmers to losing a large amount of product on the farm unsold.

These listed product characteristics require a special complex system of supportive inputs. It demands a regular marketing preparation process like washing, cooling, and proper management from the time of harvest until the product is put on display. It is frequently believed that a vegetable not only remains attractive to the consumer but must also have a shelf life of few days after purchasing it (Nonnecke, 1989).

Improving vegetable marketing in developing countries is vital for a number of reasons: rapid increase in demand from growing domestic urban populations, opportunities to earn foreign exchange by exporting high value-off-season produce; the income raising opportunities it offers to small farmers and the contribution to employment made by its labor intensive production, handling and sales requirement are some to mention (Abay, 2007).

Ideally, measures commonly recommended for the improvement of vegetable marketing are better packaging, handling, and transport; sorting by quality; extending the market season and leveling out gluts and shortages by market delivery planning and storage; developing new markets; installation of refrigerated transport and processing equipment: and establishing marketing enterprises.

2.1.3 Economic contribution

As an important sector of the economy, vegetable production plays a significant role in determining the economic conditions for farmers. Vegetable crops efficiently generate cash even from a small plot of land in a short time and help farmers improve their livelihood.

Vegetables are economic engines for productive, profitable agriculture economics. Its production provides a promising economic opportunity for reducing rural poverty and unemployment in developing countries and is a key component of farm diversification strategies (Schreinemachers et al., 2018). India is the second largest producer of vegetables in the world. Bangladesh holds the third position after India in terms of vegetable production. Vegetable production plays an essential role at the local and national levels regarding socio-economic and food security for people in urban and rural areas of developing countries (Joosten et al., 2015). In the global food economy, the most dominant vegetables are tomatoes, cucurbits (pumpkins, squashes, cucumbers and gherkins), alliums (onions, shallots, garlic) and chilies (Schreinemachers et al., 2018).

Vegetable crops are grown in many parts of the world, contributing significantly to income security and the nutritive diet of many households. According to FAO 2019, vegetables constitute 30 to 50 percent of iron and vitamin A in a poor resource diet.

2.1.4 Problems in vegetable marketing

The vegetable marketing system suffers from several defects.

- **Inadequate Transport Facilities:** Transport facilities are highly inadequate in Bangladesh. Only a small number of villages are joined by railways and pucca roads to the big market. Produce has to be carried on slow moving transport vehicles. Obviously, such means of transport cannot be used to carry produce to far-off places and the farmer has to dump his produce in nearby markets even if the price obtained in these markets is considerably low. This is even truer with perishable commodities.
- **Lack of Grading and Standardization:** Different varieties of vegetables are not graded properly. This problem occurs due to the lack of machine facilities and undefined standards.

- **Storage of produce:** There is an absence of proper ware housing facilities in the villages. Therefore, the farmer is compelled to store his products in pits, mud-vessels storehouses, etc. These unscientific methods of storing lead to considerable wastage. Approximately 1.5% of the produce gets rotten and becomes unfit for human consumption. Due to this, supply in the village market increases substantially and the farmers cannot get a fair price for their produce.
- **Malpractices in Unregulated Markets:** Even now, the number of unregulated markets in the country is substantially large. Many intermediaries taking advantage of the ignorance, and illiteracy of the farmers, use unfair means to cheat them. The chain of intermediaries in agricultural marketing is so large that farmers' share is reduced substantially. For instance, a study by Sidhan revealed that farmers obtain only about 53% of the price of rice, 31% being the share of middlemen (the remaining 16% being the marketing cost). The share of vegetables and fruits was even less, 39% in the former case and 34% in the latter. The share of middle- men in the case of vegetables were 29.5% and in the case of fruits was 46.5%. Some of the intermediaries in the agricultural marketing system are village traders, brokers, wholesalers, retailers, money lenders, etc. Another malpractice is using wrong weights and measures in the regulated markets. Wrong weights continue to be used in some unregulated markets with the object of cheating the farmers.
- **Inadequate Market Information:** It is often not possible for the farmers to obtain information on exact market prices in different markets. So, they accept whatever price the traders offer to them. To tackle this problem, the government regularly uses radio and television media to broadcast market prices. The newspapers also keep the farmers posted with the latest changes in prices. However, the price quotations are sometimes unreliable and sometimes have a great time lag. The trader generally offers less than the price quoted by the government.

2.2 Review of Past Studies Related to Problems Faced by the Farmers in Different Aspects of Agricultural Marketing

There are many studies related to problems faced by the farmers in marketing of different products.

Pramanik (2001) extensively studied the twenty-four problems of farm youth in Mymensingh villages relating to different problems in crop cultivation and marketing. Out of twenty-four problems, the top five problems in rank order were; i) local NGO taking a high rate of interest against a loan, ii) lack of agricultural machinery and tools, iii) lack of cash iv) financial inability to procure improved seeds, fertilizers and irrigation and v) marketing facilities.

Uddin (2004), in his study, identified five aspects of constraints in the commercial cultivation of vegetables viz. seed constraints, disease and insect infestation constraints, field management constraints, marketing of vegetable constraints and extension work constraints. Among these aspects of constraints, they revealed marketing problem severely faced by the farmers.

Yulafc and Cinemre (2007) conducted a study to explore marketing structures of fresh fruits and vegetables to determine marketing problems and suggest solutions. According to brokers, the most important problem of fresh vegetable and fruit marketing was not being able to find quality crops. Producers had only limited power in setting the prices of vegetables and fruits, which in the market was estimated at around 6-7 percent. The most important problem in the market was said to be not having enough standard size. In addition, there were some deficiencies related to infrastructure of the market area.

Gumataw et al. (2016) stated that intermediaries play an important role by linking farmers to traders and final markets. This is particularly the case in developing countries, where market failure is ubiquitous and food chains still consist of many stages.

Jacobs (2008) found that farmers attributed their marketing challenges to the lack of resources, lack of relevant marketing skills, and failure to meet market standards such as quality and quantity.

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

Arya and Shah (1984) conducted a study and identified five constraints: i) small and skewed distributed holding, ii) fragmented and scattered holdings, iii) shortage of labor,

iv) lack of availability of inputs and funds, v) lack of education, extension and training, especially for women.

Ismail (2001) studied problems faced by the farm youths of the hoar area of Mohangonj upazila. The study revealed six top problems in rank order. These were i) no arrangement of loan for the farm youth for fishery cultivation, ii) lack of government programs in agriculture for the farm youth, iii) absence of loan giving agencies for establishing a farm in locality, iv) general people faced problems for fishery due to government leashing of Jalmohal, v) lack of government programs for establishing poultry farm, and vi) lack of agricultural loan for the farm youth.

2.3 Review of Literature Related to the Contribution of Farmers' Selected Characteristics to Their Problems Faced in Vegetable Marketing

Various factors can influence vegetable marketing. These are educational qualification, farm size, farm size under vegetable cultivation, vegetable cultivation experience, annual family income, income from vegetable marketing, credit availability, extension contact, duration of training on vegetable marketing, use of modern communication devices and knowledge of vegetable marketing.

- **Education:** Rahman (1995), Hoque (2001), Pandict et al. (2013), Bhuiyan (2002), Salam (2003) and Ahmed (2002) found a significant negative contribution to education and problem faced by the vegetable farmers in vegetable cultivation. The findings indicated that the higher the farmers' education, the lower their problems faced in vegetable marketing. Furthermore, the other research done by Ismail (2001) and Azad et al. (2014) found that there was no significant contribution to education and problem faced by farmers in vegetable marketing. Similar relationships were obtained by Raha (1989) and Halim (2003) in their respective studies. Thus, an overwhelming majority of the researchers found a significant negative contribution of these two variables.
- **Farm size:** Azad et al. (2014) and Pandict et al. (2013) found that the farm size of the vegetable farmers had a significant negative contribution to problems faced in vegetable cultivation. Sarker (1983) and Ali (1987) also found a significant negative contribution. Roy (2007) and Aziz (2006) did another research however did not find any significant contribution. Thus it can be concluded that most studies found a significant negative contribution of these

two variables. Thus, it can be concluded that the negative contribution of farm size on vegetable marketing.

- **Farm size under vegetable cultivation:** Pandict et al. (2013) and Azad et al. (2014), found a significant negative contribution of farm size under vegetable cultivation and problem faced by the vegetable farmers in vegetable cultivation. Kashem (1977), Ali (1987) and Sarker (1983) conducted another study, and all of them found a significant negative relationship with problems faced by the farmers. On the other hand, Haque (2006) and Rahman (2006) did not find any significant contribution in another related study. Thus, it can be concluded that with increased farm size under vegetable cultivation, marketing problems decrease.
- **Farming experience:** The study by Pote (2008) and Azad et al. (2014) found that the number of years of farming experience was expected to influence the marketing decision of farmers positively.
- **Annual family income:** Pandict et al. (2013) and Azad et al. (2014) found a significant negative contribution of annual family income to their problem faced in vegetable cultivation and marketing. A similar finding was obtained by Rahman (1995) and Islam (1987). On the other hand, Sarker (1983) and Rashid (1975) did not find any significant relationship between the two variables. Thus, it can be concluded that the problem decreases with an increase in annual family income.
- **Income from vegetable marketing:** Islam (1987) reported a significant negative contribution of farm income from vegetable to farmers' problems faced in marketing. On the contrary, Hossain (1989) and Saha (1983) reported a significant positive relationship and Ali (1978) reported no significant contribution of farmers' income from vegetable and their marketing problems.. Hossain (1989), in his study, found a significant positive relationship between income and constraints faced by landless laborers. Thus, it can be concluded that the problem decreases with an increase in income.
- **Extension contact:** Nahid (2005), Akanda (1997), Mansur (1989), Islam and Ali (2017) reported that with an increase in extension contact, farmers' problems faced decrease. On the other hand, Hague (1995) and Rahman (1995) found that there was no relationship between the farmers' organizational participation

and their problems in cotton cultivation. Thus, it can be concluded that with the increase of extension contact, farmers' extent of problems decreases.

- **Duration of training:** Hossain (2001) found that the duration of the training of the respondents had a positive contribution to their knowledge of crop cultivation and marketing. Ahmed (2002) and Basher (2006) found a significant negative relationship in their study. While Azad et al. (2014) also found that training of the vegetable farmers has no contribution to vegetable marketing. Thus, it can be concluded that with the training received, the farmers' problems decrease.
- **Use of modern communication media:** Rashid (1975) found a negative contribution of communication media to agricultural marketing problems. Kashem (1977) found that there was no significant contribution of the landless laborers but existed a negative trend between the two variables.
- **Knowledge:** Pandict et al. (2013) found a significant negative contribution of knowledge on marketing and the problem faced by the vegetable farmers in vegetable cultivation and marketing. Similar findings were obtained by Rahman (1996), Pramanik (2001), Hoque (2001), Ahmed (2002), Hossain (2002) and Bhuyan (2002) in their respective studies. In contrast, in his study, Raha (1989) found that farmers' knowledge of modern boro paddy had no significant relationship with their irrigation constraints confrontation. Rashid (1999), Ismail (2001) and Salam (2003) found similar findings in their respective studies.

2.4 Conceptual Framework of the Study

A conceptual framework is a foundation for understanding the research issues and linkage among the different variables. It helps as guiding principles for analyzing the research issues. It also helps easily visualize the contribution of the dependent and independent variables. Considering the above-mentioned situation and discussion, a conceptual framework has been developed for this study, diagrammatically presented in Figure 2.1.

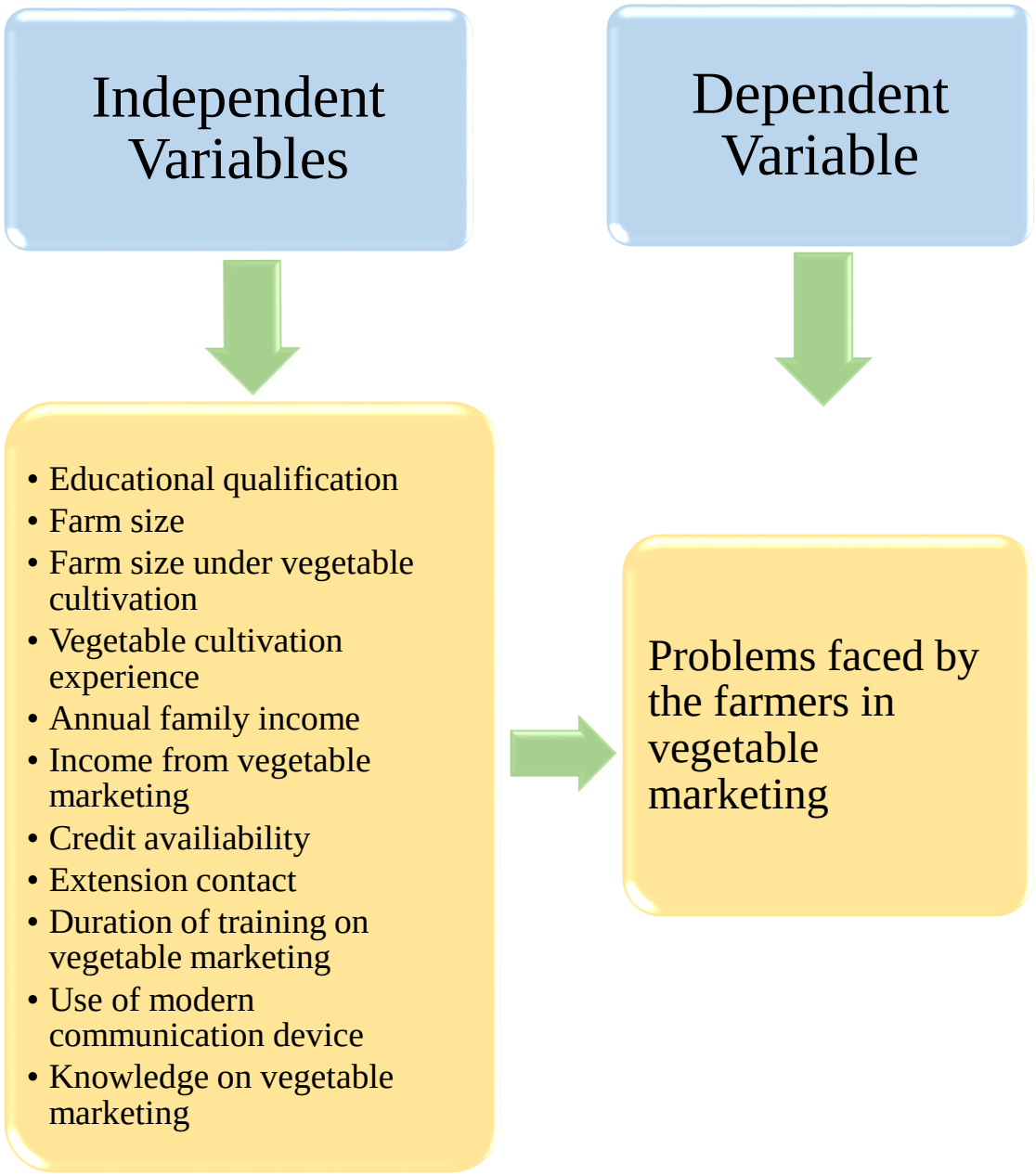

Figure 2.1 Conceptual framework of the study

CHAPTER III

METHODOLOGY

In conducting a research study, the methodological issue is one of the prime considerations for yielding valid and reliable findings. The appropriate methodology enables the researcher to collect valid and reliable information and to analyze the information properly to arrive at correct conclusions. According to Mingers (2001), the research method is a structured set of guidelines or activities to generate valid and reliable research. The methods and operational procedures followed in conducting the study e.g., selection of study area, sampling procedures, instrumentation, categorization of variables, collection of data, measurement of the variables and statistical measures. A chronological description of the methodology followed in conducting this research work has been presented in this Chapter.

3.1 Locale of the Study

The study was conducted in Chirirbandar upazila under Dinajpur district. The area of Chirirbandar upazila is 308.7 km² located at 25.6625°N and 88. 7833°E. It has a population of 232409 and 42790 households (District Human Development Report, Dinajpur 2020). Out of twelve unions, Abdulpur and Auliapukur were purposively selected because of higher vegetable production. After that, four villages, namely Hazaratpur, Mamudpur, and Krishnopur, Golahar, were randomly selected from Abdulpur and Auliapukur union. A map of Dinajpur District showing Chirirbandar upazila and a map of Chirirbandar Upazila showing the study area has been shown in Figure 3.1 and 3.2, respectively.

Figure 3.1 A map of Dinajpur district showing the Chirirbandar upazila

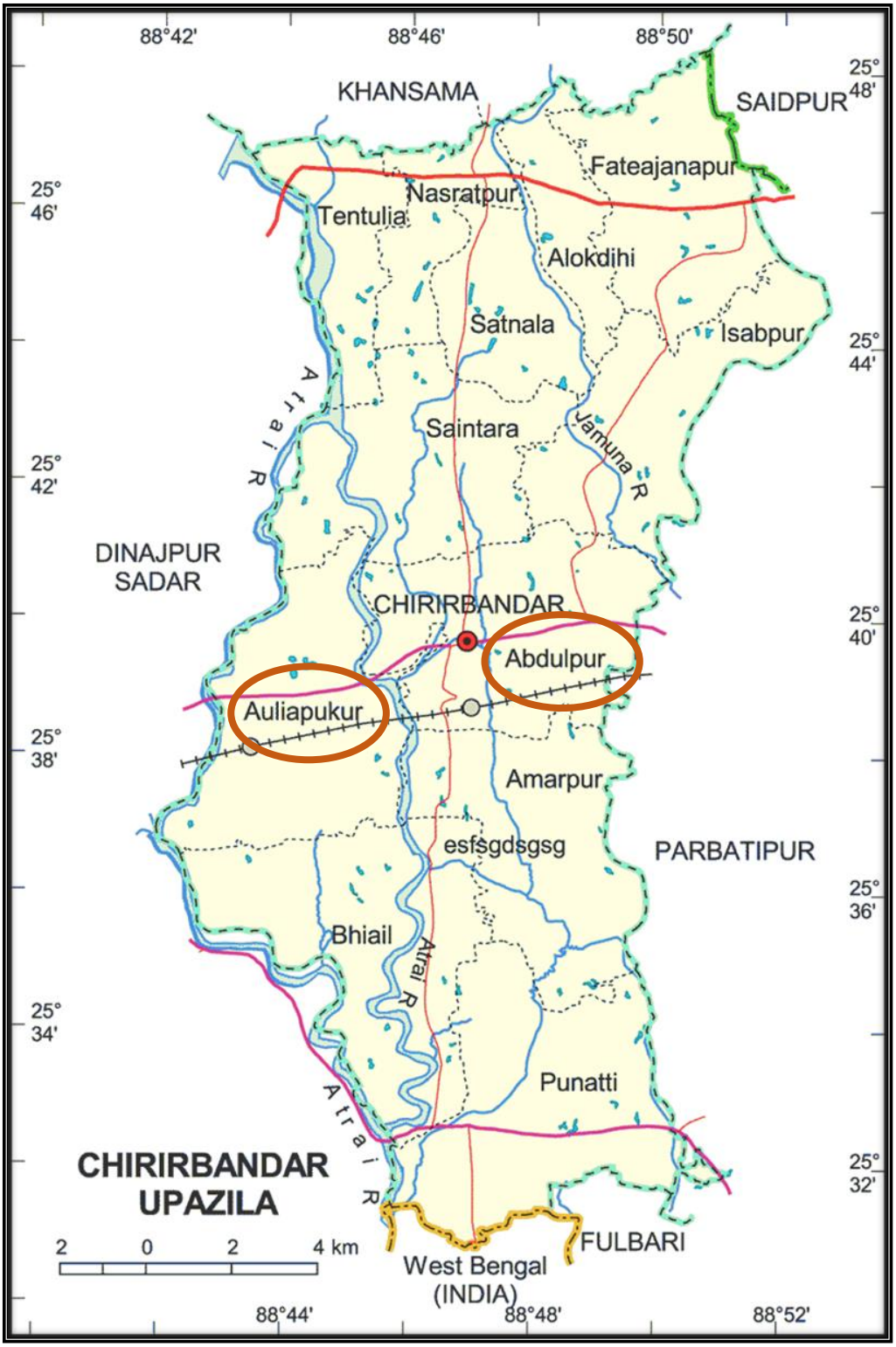

Figure 3.2 A map of Chirirbandar upazila showing the study area (Abdulpur union and Auliapukur Union)

3.2 Population and Sample of the Study

The researcher herself prepared lists of vegetable farmers of the selected four villages with the help of the Sub-Assistant Agriculture Officer (SAAO) of upazila Agriculture Office (UAO). The list comprised a total of 1177 vegetable farmers, from which 540 farm family heads from Hazaratpur village, 310 from Mamudpur village under the union of Abdulpur and 110 from Krishnopur village and 217 from Golahar village under the union of Auliapukur, which constituted the population of the study.

There are several methods for determining the sample size. Hear, Yamane's (1967) formula was used for determining the sample size for study group:

$$n = \frac{z^2 P(1-P)N}{z^2 P(1-P) + N(e)^2}$$

Where,

n = Sample size

N (Population size) = 1177

e (The level of precision) = 8%

z = the value of the standard normal variable given the chosen confidence level (e.g., z= 1.96 with a confidence level of 95%) and

P (The proportion or degree of variability) = 50%

Using the above formula, the sample size was determined 133 for this study. The sample was drawn from the population using a proportionate random sampling method. A reserve list of 12 vegetable farmers was also prepared by using 10 percent of the sample size so that this list could be used for interview if the respondents included in the original sample were not available at the time of interview. The distribution of the population sample distribution and the number of respondents in the reserve list is given in Table 3.1.

Table 3.1 Distribution of the population and sample of the respondents in four Villages of Abdulpur and Auliapukur union with reserve list

Name of the villages	Population	Sample size	Reserve list
Hazaratpur	540	61	6
Mamudpur	310	35	3
Krishnopur	110	24	2
Golahar	217	13	1
Total	**1177**	**133**	**12**

3.3 Data Collection Instrument

In social research, preparation of an interview schedule for collecting information with very careful consideration is necessary. Keeping this fact in mind, the researcher prepared an interview schedule carefully for collecting data from the respondents. Objectives of the study were kept in view while preparing the interview schedule. The initially prepared interview schedule was pre-tested among ten respondents in the study area. The pretest helped find out gaps and locate faulty questions and statements. Alterations and adjustments were made in the schedule on the basis of the experience of the pretest. The English version of the interview schedule is shown in appendix-A.

3.4 Collection of Data

The researcher collected data from the sample farmers with the help of a pre-tested interview schedule. Before starting the collection of data, the researchers met with the local SAAOs of the respective blocks to explain the objectives of the study. They requested them to provide the necessary help and cooperation in the collection of data. The local leaders of the area were also approached to render essential help. As a result of all these, a good working atmosphere was created in the study area, which was very helpful for the collection of data by the researcher.

Before going to the respondents for the interview, they were informed earlier that they would be available in their respective areas. The interviews were held individually in the house or farms of the respective respondent. The researcher established adequate rapport so the respondents did not hesitate to provide actual information. Whenever any respondent faced difficulty in understanding a particular question, the researcher took

care to explain the same clearly. The researcher in collecting data faced no serious problems. Data collection took 20 days, from 25th August to 20 September 2020.

3.5 Selection of Dependent and Independent Variables

Problems faced by the farmers in vegetable marketing was the main focus of this study and it was considered as the dependent variable.

For the selection of independent variables, the researcher went through the past related literature as far as available and discussed it with the experts in the relevant fields in agricultural and related disciplines. Availability of time, money and other resources were also kept in view in selecting the variables. Characteristics of the farmers like educational qualification, farm size, farm size under vegetable cultivation, vegetable cultivation experience, annual family income, income from vegetable marketing, credit availability, extension contact, duration of training on vegetable marketing, use of modern communication devices, knowledge on vegetable marketing were selected as the independent variables.

3.6 Measurement of Variables

The variable is a characteristic that can assume varying or different values in successive individual cases. A research work usually contains at least two important variables like independent and dependent variables. An independent variable is that factor that is manipulated by the researcher in her attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor that appears, disappears or varies as the researcher introduces or varies the independent variables (Townsend, 1953). The various characteristics of the farmers might influence their problems faced in vegetable marketing. In order to conduct the study following the objectives, it was necessary to measure the selected variables. This section contains procedures for the measurement of both independent as well as dependent variables of the study.

3.6.1 Measurement of independent variables

As mentioned earlier, eleven selected characteristics of the farmers were considered as the independent variables of the study. Procedures followed for measuring these variables are described below:

3.6.1.1 Educational qualification

Educational qualification was measured by assigning a score against a successful year of schooling by a farmer. One sore was given for passing each level from an educational institution (Rashid, 2014). For example, if the farmer did not know how to read and write, her education score was 0, a score of 0.5 (half) was given to that respondent who could only sign his/her name. If the respondent passed the S.S.C. examination, her education score was given as 10. If the farmer did not go to school but studied at home or adult learning center, her education level was determined as the equivalent to a formal school student. Question regarding this variable appears in item no. 1 in the interview schedule (Appendix-A).

3.6.1.2 Farm size

Farm size was measured by the land area under his/her management for cultivation. The unit of measurement was in ha and was considered as the farm size of a respondent. Question regarding this variable appears in item no. 2 in the interview schedule (Appendix-A).

3.6.1.3 Farm size under vegetable cultivation

The area of land measured farm size under vegetable cultivation under his/her management only for vegetable cultivation. The unit of measurement was in ha and considered the vegetable cultivation area. Question regarding this variable appears in item no. 3 in the interview schedule (Appendix-A).

3.6.1.4 Vegetable cultivation experience

The vegetable cultivation experience of the respondent was measured by the total number of years involved in vegetable cultivation. The measurement included from the year of starting first vegetable cultivation till the year of data collection. A score of one (1) was assigned for each year of experience Question regarding this variable appears in item no. 4 in the interview schedule (Appendix-A).

3.6.1.5 Annual family income

A respondent's annual family income was measured in '000' BDT on total yearly earnings from agricultural and non-agricultural sources by the respondent herself and other family members. Question regarding this variable appears in item no. 5 in the interview schedule (Appendix-A).

3.6.1.6 Income from vegetable marketing

Income from vegetable marketing refers to the financial returns in one year from vegetable. It was measured in '000' BDT on the basis of yearly earnings from vegetable marketing. Question regarding this variable appears in item no. 6 in the interview schedule (Appendix-A).

3.6.1.7 Credit availability

Credit availability of a respondent was measured in '000' BDT on the basis of the total yearly availability of credit from different sources by the respondent himself and other family members. Question regarding this variable appears in item no. 7 in the interview schedule (Appendix-A).

3.6.1.8 Extension contact

The extension contact of a respondent was measured with nine selected extension media. A scale was developed arranging the weights for 0, 1, 2, 3 and 4 for the responses for never, rarely, occasionally, often and regularly contact with these media, respectively. The respondents extension contact score of the respondents could range from 0 to 36, while '0' indicates no extension contact and '36' indicates very high extension contact. Question regarding this variable appears in item no. 8 in the interview schedule (Appendix-A).

3.6.1.9 Duration of training in vegetable marketing

Duration of training was measured by the total number of days a respondent received training in her life on vegetable cultivation. A score of 1 (one) was given to a respondent for every training day. A zero (0) score was assigned for no training received. Question regarding this variable appears in item no. 9 in the interview schedule (Appendix-A).

3.6.1.10 Use of modern communication devices

Use of modern communication devices of a respondent was measured with five selected modern communication devices. A scale was developed, arranging the weights for 0, 1, 2, 3 and 4 for the responses for never, rarely, occasionally, often and regular use of the communication devices. The score of the respondents could range from 0 to 20, while '0' indicating no use of modern communication devices and '20' indicating very high use of modern communication devices. Question regarding this variable appears in item no.10 in the interview schedule (Appendix-A).

3.6.1.11 Knowledge of vegetable marketing

Knowledge refers to the ability of a respondent to recall or recognize items of information related to anything. It was measured based on knowledge of the farmers on post-harvest practices and the marketing system of vegetables. A farmer's knowledge on vegetable marketing was determined by computing a knowledge score based on the responses against ten statements regarding post-harvest practices and marketing. These statements were collected after consulting with relevant experts reviewing existing literature and searching websites. Each of the statements carried a full weight of 1 (one). For each proper right response, a farmer received a full mark of 2, for each partial response, he received 1, and wrong or no response (as I don't know), he received 0 (zero). Thus, the knowledge score of a farmer could range from 0 to 20, where '0' indicated no knowledge and '20' showed the highest level of knowledge of vegetable marketing. Question regarding this variable appears in item no.11 in the interview schedule (Appendix-A).

3.6.2 Measurement of dependent variable

Problems faced by the vegetable farmers in marketing was the main focus and marketing problems of vegetable farmers were measured on the basis of eighteen problems. Each of the sample vegetable farmers was asked to indicate the degree of problems faced by him / her against each of 18 selected problems. The alternative response were 'very high', 'high', 'medium', 'low' and 'not at all'. The score of 4, 3, 2, 1 and 0 was assigned to these alternative responses, respectively. Finally, the marketing problems score of a respondent was determined by summing up the weights of his /her responses to all the eighteen statements. Thus, the marketing problems face

a score of the respondent ranging from zero (0) to 72, where ‘0’ indicates no problems in marketing vegetables faced by the farmers and ‘72’ indicates a very high problem.

Attempts were made to compare the problems by using the Problems Faced index (PFI) with the following formula:

PFI = Pvh × 4 + Ph × 3 + Pm × 2 + Pl × 1 + P0 × 0

Where, PFI= Problems Faced Index

Pvh = No. of vegetable farmers faced very high problems

Ph = No. of vegetable farmers faced high problems

Pm = No. of vegetable farmers faced medium problems

Pl = No. of vegetable farmers faced low problems

P0 = No. of vegetable farmers faced no problems

Thus, the possible PFI score could range from 0 – 532, where ‘0’ indicates no problem and ‘532’ indicates a very high problem. To compare the severity of the problems, rank order was determined.

3.7 Statement of the Hypotheses

According to Kerlinger (1973) "a hypothesis is a conjectural statement of the relation between two or more variables". Hypotheses are always in declarative sentence form and are generally related to or specifically to variables. In a broad sense, hypotheses are categorized into two parts:

a) Research hypotheses

b) Null hypotheses

3.7.1 Research hypotheses

In the light of the objectives of the study and the variables selected, the following research hypotheses were formulated to test them. The research hypotheses were stated in positive form. The hypotheses were as follows:

“Each of the selected characteristics of the vegetable farmers had the contribution of their problems faced in vegetable marketing.”

3.7.2 Null hypotheses

A null hypothesis states that there is no relationship between the concerned variables. To conduct statistical tests, the research hypotheses were converted to null form. Hence the null hypotheses were as follows:

"Each of the selected characteristics of the vegetable farmers had no contribution of their problems faced in vegetable marketing."

3.8 Data Processing

After completion of the field survey, all the data were coded, compiled and tabulated according to the objectives of the study. All collected data were carefully entered in SPSS Windows 23.0, which offered statistical tools applied to social sciences. Exported data were checked randomly against the original completed interview schedule. Errors were detected and necessary corrections were made accordingly after exporting. Local units were converted into standard units. All the individual responses to questions of the interview schedule were transferred into a master sheet to facilitate tabulation, categorization, and organization. In the case of qualitative data, an appropriate scoring technique was followed to convert the data into a quantitative form.

3.9 Statistical Analysis

Data collected from the respondents were analyzed and interpreted in accordance with the objectives of the study. The analysis of data was performed using statistical treatment with SPSS (Statistical Package for Social Science) computer program, version 23. The statistical measures such as range, mean, standard deviation, percentage, rank order was used to describe problems severity. Tables were also used in presenting data for clarity of understanding. Initially, the Multiple Regression Coefficient was run to determine the relationship between the selected characteristics of the vegetable farmers to their marketing problems. Five percent (0.05) probability level was used as the basis for rejecting a null hypothesis throughout the study. Co-efficient values significant at 0.05 level are indicated by one asterisk (*) and that at 0.01 level by two asterisks (**). For determining the severity of the problems, rank order was made based on the descending order of the Problems Faced Index (PFI).

CHAPTER IV

RESULTS AND DISCUSSION

This Chapter deals with the result and discussion of the present research work. Necessary explanations and appropriate interpretations have also been made, showing the possible and logical basis of the findings. However, the findings are systematically presented in the following sections for the convenience of the discussions.

4.1 Characteristics of the Vegetable Farmers

This section deals with the selected characteristics of vegetable farmers, which were assumed to be associated with the problems faced by the farmers in vegetable marketing. Different farmers possess different characteristics which are focused on by his/her behavior. In this section, 12 characteristics, including problems, have been discussed. The selected characteristics of the farmers were; educational qualification, farm size, farm size under vegetable cultivation, vegetable cultivation experience, annual family income, income from vegetable marketing, credit availability, extension contact, duration of the training, use of modern communication devices, knowledge on vegetable marketing, and problems faced by the farmers in vegetable marketing. This section describes the measurement unit, range, mean and standard deviations of those characteristics of vegetable farmers. Table 4.1 provides a summary profile of vegetable farmers' characteristics.

Table 4.1 Characteristics profile of the respondents with key variables

Sl. No.	Characteristics	Measuring unit	Range		Mean	Standard Deviation
			Possible	Observed		
1	Educational qualification	Schooling year	Unknown	0.5-14.00	4.28	4.28
2	Farm size	Hectare	Unknown	0.25-3.00	0.91	0.46
3	Farm size under vegetable cultivation	Hectare	Unknown	0.10-1.25	0.46	0.22
4	Vegetable cultivation experience	Years	Unknown	3.0-35.0	15.61	6.76
5	Annual family income	'000'BDT	Unknown	40.0-455.0	126.63	66.82
6	Income from vegetable marketing	'000'BDT	Unknown	0.0-100.0	43.92	16.54
7	Credit availability	'000'BDT	Unknown	0.0-70.0	22.64	15.21
8	Extension contact	Score	0-36	6.0-29.0	16.92	5.34
9	Duration of training	Score	Unknown	0.0-94.0	2.81	8.82
10	Use of modern communication devices	Score	0-20	0.0-18.0	8.25	4.12
11	Knowledge of vegetable marketing	Score	0-20	8.0-20.0	13.38	3.20
12	Problems faced by farmers in vegetable marketing	Score	0-72	19.0-57.0	35.69	8.90

4.1.1 Educational qualification

Educational qualifications of the respondents ranged from 0.5-14 years of schooling. The average education score of the respondents was 4.28 with a standard deviation of 4.28. On the basis of their level of education, the farmers were classified into four categories as shown in Table 4.2.

Table 4.2 Distribution of the vegetable farmers according to their educational qualification

Categories	Basis of categorization (Schooling year)	Respondents		Mean	SD
		Number	%		
Can Sign Only	0.5	71	53.4	4.28	4.28
Primary Level	1-5	8	6.0		
Secondary Level	6-10	48	36.1		
Above Secondary	Above 11	6	4.5		
Total		**133**	**100**		

Data presented in Table 4.2 show that respondents under the can sign only category constitute the highest proportion (53.4 percent) followed by the secondary level education category (36.1percent). On the other hand, the lowest proportion (4.5 percent) in the above secondary education category, followed by the primary education category (6.0 percent).

Education helps the farmers face adverse condition and adjust to unfavorable conditions by reading leaflets, booklets, books and other printed materials. Education helps the farmers broaden their outlook and expand mental horizon by assisting them to develop favorable attitudes, correct perceptions and knowledge about vegetable marketing technology. A comparatively educated person is more responsive to the facts, ideas, technology and innovation. To adjust to the same, they would be progressive-minded to adopt and become involved with modern production, processing and marketing facilities of vegetables, along with searching for the opportunities to export their vegetables to different countries through proper marketing channels (Azad et al., 2014).

4.1.2 Farm size

Farm size of the respondents ranged from 0.25 hectare to 3.00 hectares with a mean of 0.91 and a standard deviation of 0.46. On the basis of their farm size, the farmers were classified into two categories, as shown in Table 4.3.

Table 4.3 Distribution of the vegetable farmers according to their farm size

Categories	Basis of Categorization (ha)	Respondents		Mean	SD
		Number	%		
Small farm	0.21 to 1.0	111	83.5	0.91	0.46
Medium farm	Above 1.0	22	16.5		
Total		**133**	**100**		

Data presented in Table 4.3 show that the highest proportion (83.5 percent) of the farmers had small farm compared to 16.5 percent having a medium farm. No other category (marginal and large farm) was found in this study. In Bangladesh, most of the farmers live below a subsistence level. This is one of the vital reasons for not adopting improved farming practices on their farm and having lower skills in marketing practices.

4.1.3 Farm size under vegetable cultivation

The farm size of the respondents ranged from 0.10 hectares to 1.25 hectares, with a mean of 0.46 and a standard deviation of 0.22. Based on their farm size, the farmers were classified into three categories, as shown in Table 4.4.

Table 4.4 Distribution of the vegetable farmers according to their farm size under vegetable cultivation

Categories	Basis of Categorization (ha)	Respondents		Mean	SD
		Number	%		
Marginal farm	Up to 0.2	12	9.0	0.46	0.22
Small farm	0.21-1.0	119	89.5		
Medium farm	Above 1.0	2	1.5		
Total		**133**	**100.0**		

Data presented in Table 4.4 show that the highest proportion (89.5 percent) of the farmers had small farms compared to 9.0 percent having a marginal farm and only 1.5 percent had a medium farm. The findings indicated that the overwhelming majority (91.0 percent) of the farmers had marginal to small farm sizes.

4.1.4 Vegetable cultivation experience

Vegetable cultivation experience of the farmers ranged from 3 to 35 years, with a mean of 15.6 and a standard deviation of 6.76. Based on farming experience, the respondents were classified into three categories as follows in Table 4.5.

Table 4.5 Distribution of the vegetable farmers according to their vegetable cultivation experience

Categories	**Basis of Categorization (Years)**	**Respondents**		**Mean**	**SD**
		Number	**%**		
Less farming experience	Up to 9	11	8.3	15.61	6.76
Medium farming experience	10-22	103	77.4		
High farming experience	Above 22	19	14.3		
Total		**133**	**100**		

Data presented in Table 4.5 show that 77.4 percent of the farmers had medium farming experience, whereas 14.3 percent had high farming experience and 8.3 percent had less farming experience. Farming experience helps increase knowledge, improve skills and change the attitude of the farmers. It also builds the confidence of the farmers to make appropriate decisions in their time of need. The findings indicated that the overwhelming majority (91.7 percent) of the farmers had high to medium farming experience.

Generally, experience helps to cope with any problematic situation. Therefore, the higher experience might increase the risk-bearing ability of the farmers in vegetable cultivation as well as their knowledge and skill in marketing practice (Azad et al., 2014).

4.1.5 Annual family income

Annual family income of the respondents ranged from 40 to 455.00 thousand taka. The mean was 126.63 and standard deviation was 66.81. On the basis of annual family income, the respondents were categorized into three groups, as shown in Table 4.6.

Table 4.6 Distribution of the vegetable farmers according to their annual family income

Categories	Basis of Categorization ('000' BDT)	Respondents		Mean	SD
		Number	%		
Low annual income	Up to 100	50	37.6	126.63	66.82
Medium annual income	101-200	70	52.6		
High annual income	Above 200	13	9.8		
Total		**133**	**100**		

Data presented in Table 4.6 show that the highest proportion (52.6 percent) of the respondents had medium family income, while 37.6 and 9.8 percent had low and high annual family income, respectively. The gross annual family income of a farmer is an important indicator of how much she/he can invest in his farming. Generally, higher income encourages one's integrity to achieve better performance and show his/her individual better status in society. The higher income increases the risk taking capacity of the farmers' vegetable production and marketing. Farmers with low income generally invest less in their farms. Therefore, many farmers likely face difficulty in vegetable production and marketing (Azad et al., 2014).

4.1.6 Income from vegetable marketing

Income from vegetable marketing of the respondents ranged from 0.0 to 100.00 thousand Taka. The mean was 43.92 and the standard deviation was 16.54. On the basis of income from vegetable marketing, the respondents were categorized into three groups, as shown in Table 4.7.

Table 4.7 Distribution of the vegetable farmers according to their income from vegetable marketing

Categories	Basis of Categorization ('000' BDT)	Respondents		Mean	SD
		Number	%		
Low income from vegetable marketing	Up to 2.5	17	12.8	43.92	16.54
Medium income from vegetable marketing	2.51-60.5	100	75.2		
High income from vegetable marketing	Above 60.5	16	12.0		
Total		**133**	**100**		

Data presented in Table 4.7 show that the highest proportion (75.2 percent) of the respondents had medium income while 12.8 and 12.0 percent had low and high income from vegetable marketing, respectively. The income from vegetable marketing of a farmer is an important indicator of how much she/he can invest in his farming. Generally higher income encourages one's integrity to achieve better performance. The higher income increases the risk taking capacity of the farmers' vegetable production and marketing. Farmers with low income generally invest less in their farms. Therefore, a considerable portion of farmers likely face difficulty in vegetable production and marketing (Azad et al., 2014).

4.1.7 Credit availability

Credit availability for vegetable cultivation and marketing of the respondent ranged from 0.0 – 70.0 thousand Taka. The mean was 22.64 and the standard deviation was 15.21. Based on credit availability for vegetable cultivation and marketing, the respondents were categorized into three groups, as shown in Table 4.8.

Table 4.8 Distribution of the vegetable farmers according to their credit availability

Categories	Basis of Categorization ('000' BDT)	Respondents		Mean	SD
		No. of farmers	%		
Low credit availability	Up to 15	46	34.6	22.64	15.21
Medium credit availability	15.01 – 30.0	65	48.9		
High credit availability	Above 30.0	22	16.5		
Total		**133**	**100**		

Data presented in Table 4.8 show that 48.9 percent of the farmers had medium credit availability, where 34.6 percent of farmers had low and 16.5 percent had high credit for vegetable marketing. Thus, 83.5 percent of the farmers had low to medium credit availability for vegetable cultivation and marketing. Credit availability of an individual allows her to invest more in vegetable cultivation and marketing and take the opportunity to improve marketing.

4.1.8 Extension contact

The observed extension contact of the vegetable grower ranged from 6.0-29.0 against the possible range from 0 to 36, the mean and standard deviation were 16.92 and 5.34, respectively. According to this score, the vegetable grower were classified into three categories: "low extension contact" (up to 12), "medium extension contact" (13-22) and "high extension contact" (above 22). The distribution of the vegetable farmers according to their extension contact is shown in Table 4.9.

Table 4.9 Distribution of the vegetable farmers according to their extension contact

Categories	Basis of Categorization (Score)	Respondents		Mean	SD
		No. of farmers	%		
Low contact	Up to 12	30	22.6	16.92	5.34
Medium contact	13 – 22	82	61.7		
High contact	Above 22	21	15.8		
Total		**133**	**100**		

Data presented in Table 4.9 show that 61.7 percent of the vegetable farmer had medium extension contact compared to 22.6 percent of the having low extension contact. Only15.8 percent of the vegetable farmer had high contact. Thus, an overwhelming majority (84.3 percent) of the vegetable farmer had low to medium extension contact. Extension contact is a very effective and powerful source of receiving information about various new and modern technologies.

4.1.9 Duration of training in vegetable marketing

The score of the duration of training in vegetable marketing of the farmers ranged from 0-94 days. The mean was 0.281 and the standard deviation was 8.82. On the basis of the duration of training in vegetable marketing, the respondents were categorized into two groups, as shown in Table 4.10.

Table 4.10 Distribution of the vegetable farmers according to their duration of training in vegetable marketing

Categories	**Basis of Categorization (Days)**	**Respondents**		**Mean**	**SD**
		No. of farmers	**%**		
No training received	0.0	81	60.9	2.81	8.82
Training received	Above 1	52	39.1		
Total		**133**	**100**		

Data presented in Table 4.10 show that 60.9 percent of the farmers received no training while only 39.1 percent received training. An overwhelming majority (60.9 percent) of the farmers had no training. Training received develops the farmers' knowledge, skill, and attitude in a positive manner.

4.1.10 Use of modern communication devices

Use of modern communication device scores of the respondents ranged from 0 to 18.0, having an average of 8.25 and a standard deviation of 4.12. On the basis of the score of modern communication devices, the respondents were classified into three categories namely, 'low use', 'medium use' and 'high use'. The distribution of the respondents according to their use of modern communication device on marketing of vegetables is given in Table 4.11.

Table 4.11 Distribution of the vegetable farmers according to their use of modern communication devices

Categories	Basis of Categorization (Score)	Respondents		Mean	SD
		No. of farmers	%		
Low use	Up to 6	53	39.8	8.25	4.12
Medium use	7-10	37	27.8		
High use	Above 10	43	32.3		
Total		**133**	**100**		

Data presented in Table 4.11 show that the majority of the respondents (39.8%) used modern communication devices were found low compared to one-third (32.3 percent) of the respondent used highly and a little above one-fourth (27.8 percent) used moderately. So, there is a scope to increase their level of use.

4.1.11 Knowledge of vegetable marketing

Respondents' knowledge of vegetable marketing ranged from 8.0-20.0, having an average of 13.38 and a standard deviation of 3.20. On the basis of knowledge scores, the respondents were classified into three categories: ' low knowledge', 'medium knowledge' and 'high knowledge'. The distribution of the respondents according to their knowledge of the marketing of vegetables is given in Table 4.12.

Table 4.12 Distribution of the vegetable farmers according to their knowledge of vegetable marketing

Categories	Basis of Categorization (Score)	Respondents		Mean	SD
		No. of farmers	%		
Low knowledge	Up to 10	22	16.5	13.38	3.20
Medium knowledge	11-17	93	69.9		
High knowledge	Above 17	18	13.5		
Total		**133**	**100**		

Data presented in Table 4.12 show that 69.9 percent of the respondents felt in the medium knowledge category, followed by 16.5 percent in the low knowledge category and 13.5 percent in the high knowledge category. Knowledge is considered a vision of an explanation in any aspect of the situation regarding vegetable marketing. It is an act or state of understanding, a clear perception of fact or truth that helps an individual foresee the consequence he may have to face in the future. It makes individuals become rational and conscious about the related field. To perform optimum production and marketing, farmers should have adequate knowledge of different aspects of vegetable marketing.

4.2 Problems Faced in Vegetable Marketing

The scores of problems faced in vegetable marketing of the respondents ranged from 19.0-57.0 with an average of 35.69 and a standard deviation of 8.90. Based on the observed scores of problems faced in vegetable marketing, the respondents were classified into the three categories, i.e., 'low marketing problem', 'medium marketing problem' and 'high marketing problem'. The distribution is shown in Table 4.13.

Table 4.13 Distribution of the vegetable farmers according to their problems faced in vegetable marketing

Categories	**Basis of Categorization (Score)**	**Respondents**		**Mean**	**SD**
		No. of farmers	**%**		
Low problem	Up to 27	27	20.3	35.69	8.90
Medium problem	28-45	85	63.9		
High problem	Above 45	21	15.8		
Total		**133**	**100**		

Data presented in Table 4.13 show that the majority (63.9 percent) of respondents had medium problems. In comparison, one-fifth had faced low and the remaining (15.8 percent) had faced high problems in vegetable marketing. Thus, most of the vegetable farmers had faced (84.2 percent) low to medium problems in vegetable marketing.

4.3 Contribution of Selected Characteristics of the Vegetable Farmers and Their Problems Faced in Vegetable Marketing

In order to estimate the contribution of the selected characteristics of the vegetable farmers and their problems faced during marketing, the Multiple Regression analysis was used, shown in Table 4.14.

Table 4.14 Multiple Regression Coefficient showing the contribution of selected characteristics of the vegetable farmers to problems faced in vegetable marketing

Dependent variable	Independent variables	B	P	R^2	Adj R^2	F
Problems faced by the farmers in vegetable marketing	Educational qualification	-0.051	0.483	0.447	0.396	8.756**
	Farm size	0.144	0.265			
	Farm size under vegetable cultivation	-0.149	0.261			
	Vegetable cultivation experience	-0.335	0.000**			
	Annual family income	0.103	0.263			
	Income from vegetable marketing	-0.031	0.701			
	Credit availability	-0.069	0.368			
	Extension contact	-0.166	0.040*			
	Duration of training in vegetable marketing	-0.036	0.686			
	Use of modern communication device	-0.207	0.009**			
	Knowledge of vegetable marketing	-0.324	0.000**			

* Significant at $p< 0.05$, ** Significant at $p<0.01$

Data show that vegetable cultivation experience, extension contact, use of modern communication devices and knowledge of vegetable marketing were the most important variable in this study. Out of these four significant predictors, vegetable

cultivation experience was found to be the strongest predictor (β= -0.335, p=.00) followed by knowledge of vegetable marketing (β=-0.324, p=0.00), use of modern communication devices (β=-0.207, p=0.01) and extension contact (β=-0.166, p=0.04) was the lowest contributor. Eleven (11) factors were considered as independent variables in this study which jointly explained 44.7% of the variance of problems faced by farmers in vegetable marketing. Out of 11 variables, vegetable cultivation experience, extension contact, use of modern communication devices and knowledge of vegetable marketing were found negatively influence problems faced by the farmers. The F value is 8.756, which is highly significant.

4.3.1 Significant contribution of the vegetable cultivation experience to vegetable marketing problems faced by the farmers

The contribution of experience to problems faced by the farmers in vegetable marketing by testing the null hypothesis; there is no contribution of experience to problems faced by the farmers in vegetable marketing. The β value of the concerned variable was found -0.335 and the P value was found 0.000. The following observation was made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of vegetable cultivation experience to problems faced by the farmers in vegetable marketing was at 1% level of significance. So, the null hypothesis could be rejected.

Farmers' experience in vegetable marketing had a negative influence on problems faced by the farmers in vegetable marketing. This implies that the increase in experience of the farmers will decrease the problems. The findings support that farmers with more experience with the different market strategies and improved practices faced less problems.

4.3.2 Significant contribution of the knowledge of vegetable marketing to vegetable marketing problems faced by the farmers

The contribution of knowledge for problems faced by the farmers in vegetable marketing by testing the null hypothesis; there is no contribution of knowledge on problems faced by the farmers in vegetable marketing. The β value of the concerned variable was found -.324 and the P value was found .000. The following observation was made on the basis of the value of the concern variable of the study under consideration.

a. The contribution of knowledge for problems faced by the farmers in vegetable marketing was at 1% level of significant. So, the null hypothesis could be rejected.

Farmers' knowledge had a negative influence on problems faced by the farmers in vegetable marketing. This implies that the increase in knowledge of the farmers will decrease the problems. The findings show that farmers with more knowledge about marketing technology and improved practices generally faced fewer problems at work. Knowledge is considered as a vision of an explanation in any aspect of the situation regarding vegetable marketing. It makes individuals rational and conscious about the related field. Vegetable farmers should have adequate knowledge of different aspects of vegetable marketing therefore, they can apply their knowledge in their marketing process.

4.3.3 Significant contribution of the use of modern communication devices to vegetable marketing problems faced by the farmers

The contribution of the use of modern communication devices and problems faced by the farmers in vegetable marketing by testing the null hypothesis; there is no contribution of the use of modern communication devices to problems faced by the farmers in vegetable marketing. The β value of the concerned variable was found -.207 and the P value was found .009. The following observation was made on the basis of the value of the concern variable of the study under consideration.

a. The contribution of extension contact for problems faced by the farmers in vegetable marketing was at 1% level of significant. So, the null hypothesis could be rejected.

Use of modern communication devices had a negative influence on problems faced by the farmers in vegetable marketing. This implies that the farmers' problems decrease with the help of modern communication devices. The communication medium is vital in carrying the messages of improved agricultural practices and marketing information from the source to the intended audience.

4.3.4 Significant contribution of the extension contact to vegetable marketing problems faced by the farmers

The contribution of extension contact for problems faced by the farmers in vegetable marketing by testing the null hypothesis; there is no contribution of extension contact to problems faced by the farmers in vegetable marketing. The β value of the concerned variable was found 0.166 and the P value was found 0.040. The following observation was made on the basis of the value of the concern variable of the study under consideration.

a. The contribution of extension contact for problems faced by the farmers in vegetable marketing was at 5% level of significance. So, the null hypothesis could be rejected.

Farmers' extension contact had a negative influence on problems faced by the farmers in vegetable marketing. This implies that increasing the extension contact of the farmers will decrease their problems. More extension contact makes the people acquainted with new technologies and information. Discussion with the agriculture related personnel makes the people more up to date about the modern practices. Therefore they can apply their knowledge in their marketing process.

4.4 Indexing of the Problems Faced by the Vegetable Farmers

The observed problem faced index (PFI) in vegetable marketing ranged from 0 to 532. The formula for determining PFI has been shown in Chapter III. The selected 18 problems faced by the respondents were arranged in rank order according to their descending order of problem faced index (PFI), as shown in Table 4.15.

According to Problem Faced Index (PFI), 'lack of pucca roads' is the ranked 1st, followed by 'road blockade due to landslide, etc.' and 'inadequate availability of vehicles for each packing' ranked 2nd and 3rd while 'misleading information of market' is ranked the last.

Table 4.15 Indexing of the marketing problems of vegetable farmers in the locale

Aspect of problems	Problem Items	Extent of problem faced					PFI	Rank order
		Not at all (0)	Low (1)	Medium (2)	High (3)	Very high (4)		
Transport	Lack of pucca road	0 (0%)	2 (2%)	17 (13%)	56 (42%)	58 (44%)	436	1
	Road blockade due to landslide, etc.	5 (4%)	6 (5%)	53 (40%)	58 (44%)	11 (8%)	330	2
	Inadequate availability of vehicle for each packing	5 (4%)	14 (11%)	56 (42%)	40 (30%)	18 (14%)	318	3
	Bulkiness and perishable nature of the product	3 (2%)	16 (12%)	61 (46%)	39 (29%)	14 (11%)	311	4
Grading	Lack of machine facilities	3 (2%)	21 (16%)	59 (44%)	39 (29%)	11 (8%)	300	6
	Undefined standards	11 (8%)	47 (35%)	46 (35%)	6 (12%)	13 (10%)	239	11
Packing material	Poor quality	2 (2%)	21 (16%)	64 (48%)	32 (24%)	14 (11%)	301	5
	Unavailability during harvesting time	7 (5%)	55 (41%)	39 (29%)	27 (20%)	5 (4%)	234	12
Storage 0f produce	Inadequate facilities	6 (5%)	19 (14%)	68 (51%)	31 (23%)	9 (7%)	284	7
	Insufficient space	15 (11%)	61 (46%)	30 (23%)	23 (17%)	4 (3%)	206	15
	Inadequate govt. Assistance	44 (33%)	28 (21%)	36 (27%)	18 (14%)	7 (5%)	182	16

Malpractices	Weighing	5 (4%)	29 (22%)	61 (46%)	25 (19%)	13 (10%)	278	8
	In bidding / auctioning	14 (11%)	60 (45%)	34 (26%)	19 (14%)	6 (5%)	209	14
	High and undue market charge	17 (11%)	45 (34%)	39 (29%)	27 (20%)	5 (4%)	224	13
	More number of middlemen	8 (6%)	45 (34%)	52 (39%)	20 (15%)	8 (6%)	241	10
	Arbitrary commission charges	18 (14%)	30 (23%)	52 (39%)	27 (20%)	6 (5%)	239	11
Market information	Inadequate information	8 (6%)	51 (38%)	40 (30%)	23 (17%)	11 (8%)	244	9
	Misleading information	45 (34%)	33 (25%)	30 (23%)	22 (17%)	3 (2%)	171	17

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This Chapter deals with the summary of the findings, conclusions and recommendations of this study. Regression analysis was used to test the proposed hypotheses using SPSSv.23.

5.1 Summary of the Findings: The major findings of the study are summarized below:

5.1.1 Marketing problems of vegetable farmers

The scores of problems faced in vegetable marketing of the respondents ranged from 19.0-57.0 with an average of 35.70 and standard deviation of 8.90. On the basis of marketing problems of vegetable farmers' score, the vegetable farmers were classified into three categories namely; low, medium and high marketing problems of vegetable farmers. Among the vegetable farmers, the highest (63.9 percent) vegetable farmers belong to the group of medium marketing problems and the lowest percentage (15.8 percent) in high marketing problems followed by low marketing problems (20.3 percent). Among the farmers most of the vegetable farmers (84.2 percent) had low to medium marketing problems of vegetable farmers.

5.1.2 Selected characteristics of the vegetable farmers

Eleven characteristics of the farmers were selected to explore their contribution of problems faced by the farmers in vegetable marketing. Findings in respect of the selected characteristics are summarized below:

Education: The highest proportion (53.4 percent) of the farmers were found in the can sign only. Primary, secondary and above the secondary level found 6.0 percent, 36.1 percent and 4.5 percent, respectively.

Farm size: The highest proportion (83.5 percent) of the farmers had a small farm size, while 16.5 percent belonged to the medium farm category.

Farm size under vegetable cultivation: The highest proportion (89.5 percent) of the farmers had small farm sizes, while 9.0 percent and 1.5 percent belonged to the marginal and medium farms, respectively.

Vegetable cultivation experience: About 77.4 percent of the vegetable farmers had medium experience in vegetable cultivation and marketing, followed by 14.3 percent high and 8.3 percent had low farming experience in vegetable marketing.

Annual family income: The highest proportion (52.6 percent) had medium annual family income compared with 37.6 percent having low income and 9.8 percent having a high annual family income.

Income from vegetable marketing: The highest proportion (75.2 percent) had medium annual family income compared with 12.8 percent having low income and 12.0 percent having high income from vegetable marketing.

Credit availability: The highest proportion (48.9 percent) had medium credit availability where 34.6 percent of farmers had low and 16.5 percent had high credit availability for vegetable cultivation and marketing.

Extension contact: The highest portion (61.7 percent) of the farmers had medium extension contact where 22.6 percent had low and 15.8 percent had high extension contact.

Duration of training in vegetable marketing: The highest portion (60.9 percent) of the vegetable farmers had no training. On the other hand, 39.1 percent of farmers received training.

Use of modern communication devices: Most respondents (39.8 percent) used modern communication devices less followed by 32.3 percent had high and 27.8 percent had medium use.

Knowledge of vegetable marketing: Majority (69.9 percent) of the farmers had a medium understanding of various aspects of vegetable marketing, followed by 16.5 percent had a low and 13.5 percent had a high knowledge category.

Problems faced in vegetable marketing: About 63.9 percent of the farmers faced medium problems.

5.1.3 Result of hypothesis testing

Out of eleven selected characteristics of the farmers' vegetable cultivation experience, extension contact, use of modern communication devices and knowledge of vegetable marketing had a significant negative contribution to their problems faced in vegetable marketing. The rest seven characteristics, i.e., educational qualification, farm size, farm size under vegetable cultivation, annual family income, income from vegetable marketing, credit availability and duration of the training, had no significant contribution to the problems faced in vegetable marketing.

5.2 Indexing of the Problems Faced by the Farmers in Vegetable Marketing

For indexing, the problems, the rank order of the eighteen dimensions of marketing problems of vegetable farmers were made by the descending order of problems faced index (PFI). As per the Problems faced index (PFI) 'lack of pucca road' positioned the 1st followed by 'road blockade due to landslide, etc.' while 'misleading information' about the market was in the last position.

5.3 Conclusions

Vegetables are nutritional powerhouses, key sources of micronutrients needed for good health. Vegetables add diversity, flavor, and nutritional quality to diets. A strengthened focus on vegetables may be the most direct and affordable way to deliver better nutrition. Vegetables are also economic engines for productive, profitable agricultural economies. Intensified vegetable production has the potential to generate more income and employment than other segments of the agricultural economy, making vegetables an important element of any agricultural growth strategy.

Findings of the present study and the logical interpretation of other relevant facts prompted the researcher to draw the following conclusions:

- Despite the majority of the farmers faced low to medium problems in vegetable marketing, any sort of problem may negatively impact their market access or participation. Therefore, it is essential to keep continuing our support to improve the condition further.
- Farmers with more experience in vegetable cultivation, keeping regular contact with the local extension office, using modern communication devices and possessing higher knowledge in vegetable marketing faced fewer problems in

marketing than others. This indicates motivating farmers to keep regular contact with the local extension office, updated with the latest knowledge and use of modern communication devices, would enable them to reduce their problems in vegetable marketing.

- On the basis of PFI, the vegetable farmers faced various types of problems. Among all of problems' lack of pucca road' is the ranked 1st followed by the 'road block due to land slide', while 'misleading information of market' is ranked the last. Therefore, it may be concluded that farmers mostly faced problems in terms of vegetable transportation from the farmyard to the market.

5.4 Recommendations

5.4.1 Recommendation for policy implications

On the basis of observation and conclusion drawn from the findings of the study following recommendations are made to the planners and policymakers to mitigate the problems faced by the farmers.

- Vegetable contributes an important role to the economy in our country. However, the farmers in the study area faced problems in vegetable marketing to some extent. So, the problems need to be minimized. Infrastructural development, such as roads, cold storage, etc., must be constructed to mitigate the distance problem.
- Knowledge and experience in vegetable marketing are vital in performing agricultural operations effectively and efficiently. Therefore, it may be recommended that measurement should be taken by the concerned authorities (DAM, NGOs, etc.) by providing accurate and reliable steps at the right time.
- Marketing facilities can be increased by the concerned authorities such as the Department of Agricultural Marketing (DAM) and other NGOs.

5.4.2 Recommendation for further study

Marketing problems of vegetable growers were conducted in two selected unions of Dinajpur District. A small and limited research work cannot provide unique and universal information related to the impact of improving the farmers' socio-economic status. Further studies should be undertaken on related matters. Based on scope and

limitations of the present study and observations made by the researcher, the following recommendations are made for further study:

- The study was conducted in Chirirbandar Upazila under Dinajpur District. Similar studies should be conducted in other parts of the country to get a clear picture of the whole country which will be helpful for effective policy formulation.
- The present study was undertaken to explore the contribution of eleven selected characteristics of the farmers with their problems faced in vegetable marketing. Therefore, it could be recommended that further studies should be designed considering other agricultural and non-agricultural activities and other characteristics of the farmers that might affect problems faced in vegetable marketing.
- In the present study farm size, annual family income, credit availability, training and educational qualification had no significant contribution to their problems faced in vegetable marketing. In this connection, further verification is necessary.
- All problems affect the performance of the vegetable farmers. There is a need for undertaking research on the various problems faced by the farmers in vegetable marketing which affect their performance.
- Further research is needed to explore farmers' problems mitigation strategies in marketing vegetables.
- Research should be undertaken on the effectiveness of agricultural extension services and other related organizations in helping people to solve their vegetable marketing problems.

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APPENDICES

Appendix – A

(English version of the interview schedule)

Department of Agricultural Extension and Information System

Sher-e-Bangla Agricultural University, Dhaka-1207

An Interview schedule for a research study entitled:

VEGETABLE MARKETING PROBLEMS FACED BY THE FARMERS IN CHIRIRBANDAR UPAZILA UNDER DINAJPUR DISTRICT

Serial no ……

Name of the respondent: …… Village: ……

Union: …… Upazila: ……..

District: ……

(Please provide following information. Your information will be kept confidential and will be used for research purpose only)

Part A

1. Educational qualification: Please mention your educational status from the following:

i. Can't read and write

ii. Can sign name only

iii. Studied up to class: ……..

iv. I did not formally study but my education is equivalent to class……

2. Farm size `

(Please mention the total area of land you have cultivated in last year)

…….ha

3. Farm size under vegetable cultivation

(Please mention the total area of land you have cultivated vegetable in last year)

…….ha

4. Vegetable cultivation experience

(Please mention the following information)

How long have you been engaged in vegetable cultivation?

…….……Years

5. Annual family income: Please indicate the production and income of your family has earned last year from different sources

Source of income	**Income (Tk.)**
A. Agricultural Sources	
Rice	
Wheat	
Maize	
Vegetable	
Other crops	
Livestock	
Poultry	
Fisheries	
B. Non-agricultural Sources	
Business	
Services	
Labor	
Remittance	
Others (please specify)…….	
Total(A+B)=	

6. Income from vegetable marketing

(Please mention the total income from vegetable marketing in last year) …….Tk.

7. Credit availability: Please indicate your source of credit and amount.

Sl. No.	**Source of credit**	**Amount (Tk.)**
1.	Friends	
2.	Relatives	
3.	Banks	
4.	NGOs	
5.	Organizations	
6.	Others	
Total		

8. Extension contact:

Please mention the extent of your contact with the following personnel for receiving information regarding your agricultural business.

Sl. No.	**Sources of information**	**Extent of contact**				
		Regularly	**Often**	**Occasionally**	**Rarely**	**Never**
1.	Farmers/neighboring farmers/ relatives	3times or more / month ( )	1-2 times/2 month ( )	1-2times /3month ( )	once/ 6 month ( )	Not even once ( )
2.	Input dealer (e.g. seed, pesticide, fertilizer)	2 times or more / month ( )	1-2 times/2 month ( )	1-2 times/3 month ( )	Once/6 month ( )	Not even once ( )

3.	NGO workers	3 times or more / month ( )	1-2 times / 2 month ( )	1-2times / 3month ( )	Once /6 month ( )	Not even once ( )
4.	Sub-Assistant Agricultural Officer (SAAO)	2 or more times / month ( )	1-2 times / 2 month ( )	1-2times / 3 month ( )	Once/ 6 month ( )	Not even once ( )
5.	Upazila Agricultural Officer (UAO)	6 or more times / year ( )	4-5 times /year ( )	2-3 times / year / ( )	Once / year ( )	Not even once ( )
6.	Agricultural extension Officer (AEO)	6 or more times / year ( )	4-5times /year ( )	2-3 times / year ( )	Once/year ( )	Not even once ( )
7.	Farm Publications (e.g. Krishi katha, poster, leaflet)	10 or more times/ year( )	6-9 times/ year( )	3-5 times/ year ( )	1-2 times/ year( )	Not even once ( )
8.	Farm Television programs	4 times or more / month ( )	3 times / month ( )	2 times/ month ( )	once/ month ( )	Not even once ( )
9.	Farm Radio programs	4 times or more / month ( )	3 times / month ( )	2 times / month ( )	once/ month ( )	Not even once ( )

9. Duration of training in vegetable marketing:

Have you attended any agricultural training program? ( ) Yes ( ) No

If yes, please mention the following information

Sl. No.	**Name of the training course**	**Sponsoring organization**	**Duration (Days)**
1.			
2.			
3.			
4.			
5.			
Total			

10. Use of modern communication devices:

Please put the tick mark (√) against each statement

Sl. No.	**Statement**	**Extent of use**				
		Regularly	**Often**	**Occasionally**	**Rarely**	**Never**
1.	Do you use internet for your vegetable marketing					
2.	Do you use mobile for your vegetable marketing					
3.	Do you use any apps for your vegetable marketing					
4.	Do you watch farm TV program for					

	your vegetable marketing					
5.	Do you receive information from radio program for your vegetable marketing					

11. Knowledge of vegetable Marketing:

Sl. No.	**Questions**	**Full mark (2)**	**Partial mark (1)**	**No answer (0)**
1.	Which is the proper time for vegetable harvesting?			
2.	How many days ago is it better to spray pesticide /insecticide to harvest vegetable?			
3.	Which stage of vegetable is more suitable for marketing?			
4.	Which type of marketing is more profitable?			
5.	Do you need to wash vegetables before marketing to get more profit?			
6.	Is sorting and grading necessary for getting high market price?			
7.	Which is the better storage condition for harvested vegetables?			
8.	Which vegetables need to pack for marketing purpose?			
9.	How can minimize loss of marketing vegetables by using lining material?			
10.	How to reduce transportation cost in marketing vegetables?			

12. Problems faced by the vegetable farmers in marketing:

Please mention the extent of the following problems you face during marketing?

Sl. No.	Problems	Very high (4)	High (3)	Medium (2)	Low (1)	Not at all (0)
A.	**Transport**					
1.	Lack of pucca roads					
2.	Road blockade due to land slide, etc					
3.	Inadequate availability of vehicle for each packing					
4.	Bulkiness and perishable nature of the produce					
B.	**Grading**					
5.	Lack of machine Facilities					
6.	Undefined standards					
C.	**Packing material**					
7.	Poor quality					
8.	Unavailability during harvesting time					
D.	**Storage of produce**					
9.	Inadequate facilities					
10.	Insufficient space					
11.	Inadequate govt. Assistance					

E.	**Malpractices**					
12.	Weighing					
13.	In bidding /auctioning					
14.	High and undue market charge					
15.	More number of middleman					
16.	Arbitrary commission charges					
F.	**Market information**					
17.	Inadequate information					
18.	Misleading information					

Thanks for your cooperation.

Signature of the interviewer ----------

Date ---------