VALUE CHAIN ANALYSIS OF TOMATO IN SOME SELECTED AREAS OF MANIKGANJ DISTRICT

MD. IMRAN HOSSAIN

DEPARTMENT OF AGRIBUSINESS AND MARKETING
SHER-E-BANGLA AGRICULTURAL UNIVERSITY
DHAKA- 1207

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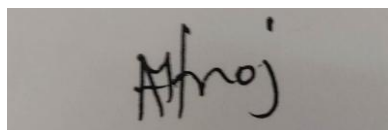# VALUE CHAIN ANALYSIS OF TOMATO IN SOME SELECTED AREAS OF MANIKGANJ DISTRICT

BY

MD. IMRAN HOSSAIN
REGISTRATION NO. 14-06254

A Thesis
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Approved By:

Mahfuza Afroj	**Md. Abdul Latif**
Assistant Professor	Professor
Department of Agribusiness and Marketing	Department of Agricultural Statistics
SAU, Dhaka	SAU, Dhaka
Supervisor	**Co-Supervisor**

Dr. Sharmin Afrin
Chairman
Department of Agribusiness and Marketing
Examination Committee

CERTIFICATE

This is to certify that the thesis entitled, **"VALUE CHAIN ANALYSIS OF TOMATO IN SOME SELECTED AREAS OF MANIKGANJ DISTRICT"** *submitted to the Faculty of Agribusiness & Management, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of* **MASTER OF SCIENCE** *in* **AGRIBUSINESS AND MARKETING**, *embodies the result of a piece of bonafide research work carried out by* **MD. IMRAN HOSSAIN**, *Registration No. 14-06254 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

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

Date: June 2022
Place: Dhaka, Bangladesh

Mahfuza Afroj
Assistant Professor
Department of Agribusiness
and Marketing
SAU, Dhaka
Supervisor

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DEDICATED
TO
MY BELOVED PARENTS

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VALUE CHAIN ANALYSIS OF TOMATO IN SOME SELECTED AREAS OF MANIKGANJ DISTRICT

ABSTRACT

A series of value-generating activities associated with product marketing from farm level to the ultimate consumer referred to as the value chain. In Bangladesh tomato value chain starting from producer then there may have many intermediary channels like tomato producer, Faria, Bepari, Wholesaler, Retailer and Consumer etc. The study was conducted at saturia and singair upazila under Manikganj district. To identify the actors involved in value chain and their function in tomato marketing, to estimate the value addition of tomato by the actors in tomato market, to identify the constraints of tomato marketing and suggest measure for the improvement of tomato marketing in the selected area. The selected samples included 70 (Farmer 25, faria 10, bepari 10, wholesaler 10 and retailer 15). In the study areas there are five value chain included. In this study cost and margin analysis of tomato, cost of production, variable cost, fixed cost, gross cost, gross return, gross margin, net return, value addition, marketing cost, market price calculated. Value addition of farmer is 25.16%, bepari is 22.63% and faria is 7.37% and wholesaler is 31.72%. Marketing cost of retailer is 1.30 tk/kg, wholesaler is 3.62 tk/kg, bapari is 1.84 tk/kg and faria is 0.70 tk/kg. Net marketing margin of retailer is 2.15 tk/kg, wholesaler is 2.20 tk/kg, bapari 0.47 tk/kg and faria is 0.29 tk/kg. Proper credit facility, fertilizer supply, seed supply, irrigation facilities, electricity supply and transport facility should be improve for tomato development in Bangladesh.

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CHAPTER I
INTRODUCTION

1.1 Introduction

Tomato (*Solanum lycopersicon*) is one of the most famous, versatile and broadly grown vegetable all through the world and in nearly every domestic garden. Vegetable production in the world has executed great boom in last 20 years because of new generation adoptions like current manufacturing practices, new variety seeds and mechanization of farming. In Bangladesh, the area of cultivation is about 13,066 ha with the production of about 74,000 m tons (FAOSTAT, 2021). Among distinct veggies, tomato captures about 60% of total fresh vegetables produced in the global. Tomato is rich a source of vitamins (A and C), minerals, organic acid, essential amino acid and dietary fibers. Tomato contains lycopene and beta-carotene pigment (Debjit *et al*., 2012). Aside from its dietary importance, huge productivity of tomato is that the blessing for landless farmers, laborers, distressed of developing nations as it assists to boom income and reduce inequality (Mitra and Yunus, 2018).

Bangladesh, a growing has witnessed approximately 6.5 instances increase in tomato manufacturing after its independence. Tomato is one a few of the predominant greens produced in Bangladesh that occupies approximately 25% of overall sparkling vegetables produced in Bangladesh. Farming machine is transferring from huge to industrial stage this is answerable for increasing tomato productivity (Mitra and Prodhan, 2018). Although tomato is understood as a wintry weather vegetable, it is also available in summer season due to the occasion of cutting-edge sorts by means of Bangladesh Agricultural Research Institute (BARI) and Bangladesh Institute of Nuclear Agriculture (BINA). Tomato is the second one maximum vital vegetable export commodity after potato. It is found that other veggies have restrained call for as they're consumed solely most effective by using

the urban affluent/elite elegance, so the tomato is familiar, it is consumed by means of each affluent/elite and poor training. Tomato is appeared due to the fact the vegetable of the in large part negative masses (Adepetu, 2005). The notably perishable nature of tomato makes it tough to domesticate by means of many farmers at commercial level in Bangladesh; no matter its numerous demand and significance in the vitamins of the humans. This is regularly seemingly due to the fact the producers of the crop are usually small-scale farmers who nevertheless perform inside the frame paintings of traditional agriculture. In view of the possibility which this crop holds for the agro-allied industries and domestic intake in Bangladesh, that there may be a transparent need for the behavior of research on profitability evaluation of seasonal tomato production. Tomato is an essential vegetable that is fed on all of the year spherical.

Tomatoes are labeled into two categories consistent with its manufacturing season. These are rabi tomato and summer tomato. Tomatoes are produced all of the year spherical however its high season during December to March. There are few studies associated with tomato administered in Bangladesh. Zaman *et al*. (2006) studied approximately manufacturing potentiality of summer season tomato in Manikganj. Vegetables sub-region plays a crucial function for the improvement of Bangladesh. Vegetables are an herbaceous plant whose culmination, seeds, roots, tubers, leaves and so forth are used as food. Vegetables can be counted as a less expensive but maximum crucial dietary supply. Here it might be stated that veggies can be grown in a small region of land, even within the domicile or inside the rooftops. Another benefit of vegetable cultivation is that huge variety of greens may be produced all the year round .In addition, vegetable quarter is hard work intensive and it offers the county a considerable and huge street for generating rural employment possibilities substantially. Our fertile land gives our countrymen to grow diverse forms of veggies in a big amount spherical the 12 months but iciness weather is maximum appropriate for growing veggies. Previous researches were highlighted the

profitability of tomato production and find out the primary problems of tomato production in distinct regions of Bangladesh. The gift look at has emphasized no longer only the prices and returns of tomato production however also mounted the relationship between socioeconomic characteristics and troubles faced by using the tomato farmers. This observe cautiously investigates the foremost problems of tomato farmers inside the decided on districts. The findings of the research will be beneficial to the coverage maker to formulate an effective guiding principle for the tomato cultivators' days beforehand. In Manikganj district tomato is grown in 398 thousand hectares with the production of 4634 million tones approximately and productivity is 11.64 tons ha1 (BBS, 2018).

1.2 Importance of Vegetable Production

In modern day generation of diversification of agriculture, farmers are now moving from traditional subsistence agriculture to commercial agriculture land holdings are in standard small in our country. This makes a farmer to undertake vegetable production.

Vegetables are crucial in lots of approaches, including:

• Changing food conduct of humans and so their food baskets.

• Increasing awareness of people towards balanced diet plan and idea of nutritional protection, vitamins, minerals, flavor, palatability, variability and boom appetite.

• Vegetables produce extra biomass in step with unit vicinity and fetch greater charges consistent with unit production so are greater low in cost to grow.

Generally greens are the main component of human meals that supplies proteins, carbohydrates, fat, vitamins and minerals. Majority of the population in Bangladesh be afflicted by extreme malnutrition, which has a terrible impact at the improvement of the physical and intellectual growth. Vegetable production provides a promising

monetary opportunity for reducing rural poverty and unemployment in developing nations and is a key component of farm diversification techniques. Vegetables are mankind's most low cost supply of nutrients and minerals needed for true fitness. A deficiency of these nutrients can result in eye infection, terrible vision, night blindness, and frequent cold, loss of appetite and skin issues. Vegetable are edible as root, stem, leaf, fruit and seed. Each institution contributes to diet in its own manner. Fleshy roots are excessive in electricity fee and top resources of diet B. Seeds are extraordinarily high in carbohydrates and proteins. Leaves, stem and end result are superb resources of minerals.

According to FAO, per capita consumption of vegetables in Bangladesh is very low (40 g/day/person) compared to that in Nepal (175.1g), India (190.4g) and Srilanka (91 8g). Therefore, vegetable production and consumption in the country must be increased manifold to upgrade the food supply and dietary standard.

As vegetables are generally short duration crops, these are suitable for mixed, companion and intercropping. Nevertheless, there is a bright scope of earning foreign exchange by strengthening the export of fresh and processed vegetables.

1.3 Background information on tomato

The tomato, or nightshade own family (Solanaceae), consists of about eighty five genera and a pair of 300 species. The place under tomato farming has accelerated through the years. The production of tomato has also extended from approximately 415490 metric heaps in 2019-20 to about 447,815 metric heaps in 2020-21 (BBS, 2021).

1.4 Status of tomato Production

Tomato is one of the vital veggies for boom and renovation of fitness of human beings. In the month of December to March sorts of tomatoes are all through Bangladesh. But within the relaxation part of the year human being frequently

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confront first rate shortage of tomatoes. Bangladesh is pre-dominantly an agricultural country with rich soil situation and climate. Numerous kinds of vegetables could also be grown over right here in April to November. It is an issue of regret that when four decades of independence we could not produce sufficient veggies for the human being. Current vegetable production in Bangladesh is appreciably underneath domestic call for.

At present, vegetable production is around 1.8 million MT, whilst demand is envisioned to be 10 million MT (BBS, 2010). This demand-supply gap is probably to amplify with the increase of population and boom in line with capita income. Tomatoes in Bangladesh is generally grown small farmers that is (42%) in comparison to medium (40%) and big farmers (16%). Annual production of tomato in the country from 2018-2019 to 2020-2021

Table 1.1: Annual Production of Tomato in this Country in 2019-2020

Year	Area(Acres)	Production(M. Tones)
2018-2019	69697	387653
2019-2020	70460	415494
2020-2021	72878.64	447815.43

Source: BBS 2021

1.5 Statement of problem

Vegetables occupy hardly 2.64 percent of the total cropped area of the country which is very low in view of the national need. Hence, it is necessary to increase the production and productivity of vegetables to meet the demand of growing population to ensure better nutrition by adopting improved technology. Present production of 1.5 million tons of vegetable supply only 145 g per capita per day against recommended requirements of 300 g (BBS, 2018). Agricultural development can be constrained by many factors. Key constraints include high

transaction costs, market imperfection, lack of technology, lack of access to credit, perishability of the products and the prevalence of staple foods that are only slightly traded (World Bank, 2008). These constraints may result in either exclusion ofsmallholders from market or unequal distribution of benefits. This high loss is due to packaging and poor means of transportation such as human labor, donkeys and mules, public transport and rented trucks (Kebede, 1991; Samira *et al*. 2011). Massaoud and Srinivass (2012) revealed that there is the tendency to increase producer's share in the consumer's price if the number of intermediaries is reduced and the government intervenes in order to organize and structure the marketing cooperative unions so that the farmer can use these unions as profitable channels to sell their produce. In view of the agro-climate condition and increasing popularity of tomato cultivation in Manikganj District, it is felt necessary to study value chain analysis and existing marketing channels of tomato in Bangladesh: A study based on some selected areas of Manikganj District.

1.6 Significance of the study

The study will help provide scientific information on the necessary social and psychological factors that would influence the cultivation and any large scale tomato production in the study area as well as in Manikganj. Bangladeshi's age-old farming practices have taken a turn in recent years. There has been a technological breakthrough because of the evolution of high yielding variety seeds, increasing use of fertilizer, insecticides, pesticides, the installation of irrigation facilities and tractorization. To maintain this tempo and pace of increased production through technological development, an assurance of remunerative prices to the farmers is a prerequisite and this assurance can be given the farmer by developing an efficient marketing system. Thus the present study bought to provides answer to the following questions.

❖ What is per unit cost incurred and returns obtained from tomato production?

❖ What is the technological breakthrough has led to a substantial increase in production on the farms and to the larger market?

❖ What are the possibilities of the resource for profit maximization?

1.7 Objectives of the Study

Looking to the above facts, it is essential to conduct a study, which could say something about variation and growth rate in area, production and marketing of tomato in the Manikganj District of Bangladesh. The present study is therefore, under taken in view ofthe following specific objectives:

a. To ascertain the socio-economic characteristics of tomato producers in the study area.

b. To analyze the profitability of tomato production.

c. To identify the problems of tomato production.

1.8 Limitations of the study

A. The coverage of study area was limited. This is due to the fact that coverage of large area is beyond the capacity of investigator.

B. The primary data collected for the study were entirely based on memory of the respondents because cultivators do not keep any record regarding their farm practices and marketing.

C. The illiteracy of the farmers was also a problem for gathering the data. Some of the farmers did not co-operate in giving data because of some misunderstanding regarding agricultural taxes, ceiling etc.

D. They were biased in giving data towards higher side of the investment and lower side towards productivity. However, sufficient care was taken to collect the data by

cross checking with the educated neighboring farmers and other village leaders and union parishad member etc.

E. The findings from this observe might be useful for all stakeholders concerned in tomato enterprise and in formulation of policies related to tomato manufacturing and advertising for the examine regions and other similar areas.

CHAPTER II
REVIEW OF LITERATURE

The purpose of this chapter is to review of literature having relevance to the present study. The researcher made an elaborate search of available literature for the above purpose. But it is rare to find a study dealing with the profitability of tomato cultivation. The researcher attempted to search the literatures and found few studies on the use of tomato cultivation.

Rahman *et al*. (2022) conducted a study for the assessment of marketing system of summer tomato in Jashore. Summer tomato had high demand and high value crop in summer season among the consumers. Data were collected from 30 randomly selected tomato farmers and 60 traders from different market of Jashore district of Bangladesh during July-October, 2019. Farmer, faria, bepari, wholesaler, commission agents and retailer were involved in marketing of summer tomato. Marketing cost of farmar, faria, bepari, wholesaler, retailer (urban) and retailer (rural) were 430.00, 691.00, 2184.00, 2443.00, 1857.00 and 1074.00 Tk ton^{-1}, respectively. Net margin or profit of the faria, bepari, wholesaler and retailer were 1300.00, 817.00, 557.00 and 2143.00 Tk ton^{-1}, respectively. There were seven marketing channel exist in tomato marketing. Total marketing cost of all intermediaries was 7604.00 Tk ton^{-1} and net margin was 4826.00 Tk ton^{-1}. Marketing efficiency was 2.25. Price spread between consumer paid and producer received was 8000.00 Tk ton^{-1}. On the other hand, producer share was 78%. Spoilage and damage, transportation and packaging were the main marketing problem of summer tomato.

Khatun *et al*. (2022) conducted a study aim to overview the production and marketing of vegetables and value chains and channels of vegetable marketing and the problems related with the production and selling of vegetables. Conspicuously,

the cultivation of vegetables in our country is growing day by day due to the higher profitability. Nearly 1.25 million hectares of cultivable land area are engaged for producing vegetable. This study makes an attempt to pronounce the existing vegetable supply chain system along with the problems and constraints faced by the farmers during producing and marketing of vegetables. The usual supply chain is that the middlemen collect vegetables from growers at cheaper price then sell it to the general consumers with markup. There is almost a complete absence of specialized facilities and equipment for handling vegetables in the market. The study reports some policies on the basis of the problems with a view to increasing the production and marketing opportunities of the farmers. In particular, vegetable marketing system is unorganized in Bangladesh which needs to be developed for the wellbeing of the farmers and common people.

Ghasemi *et al*. (2022) conducted a study to compare the global market structure of these two products as two links in the tomato supply chain and calculate the revealed comparative advantage of their exports in the world and the target countries. According to the results, the global market structure of both products in the period 2010-2018, despite the high share of the top four market powers, has been an open oligopoly for most of the years, which indicates a small share of the most competitors and high competition between them. However, due to the large share and stability of market leadership, it is unlikely that small countries will be able to capture the share of large countries. Therefore, it is suggested that Iran, with an average share of 1.61% in the tomato market and 5.30% in the paste market, prioritize a number of markets in which it has more competitiveness for market penetration, market development, and branding. On average, exports of tomatoes and tomato paste to Turkmenistan, Iraq, and Afghanistan have had the greatest comparative advantage for Iran. It is proposed to prioritize competition, market development, and branding in a number of markets in which it has competitiveness and stability based on the revealed comparative advantage index, including

Turkmenistan and Afghanistan. Development of the export market of tomato paste should be a priority of the country.

Haverkort *et al.* (2022) found the actors (breeders, growers, processors, retailers and users) in the value chain are recognized, and their information and material flows identified. The influence of genotype, environment and crop management and the efficient use of resources during the production of raw material, tubers harvested for processing purposes, are delineated. It is shown that climate change affects performance and that consumers looking for quality and new products are hardly interested in the primary processes, nor are breeders and processors showing interest in consumer concerns. Crop performance is dependent on yield and quality (dry matter, sugars, tuber size and desired and undesired constituents). Factory performance relies on recovery, reuse of rejects and avoidance of wastes. Heatmaps drawn of classes of productivity and losses and their attributes reveal where gains are to be made on fields, farms and factories to improve efficiencies, reduce the impact on the environment, and opportunities for decarbonisation. Data were obtained from secondary sectoral sources and open interviews with key players across the supply chain—covering all its main stages, i.e., production, packaging, storing, transportation, wholesaling, and retailing. The findings are summarized in three supply chain maps that illustrate the areas concerning sustainability, value chain and stakeholders. These maps synthesize a bigger picture of the supply chain that reveals the complicated interactions among its actors, the hidden bottlenecks in the flow of information and the areas that need deeper exploration. Its fundamental implication is the design of a targeted research framework, underlying the main priorities of the Greek tomato supply chain and eventually the Greek agri-food sector.

Quaderi *et al.* (2021) tried to forecast the home marketplace chain and export potentiality of horticultural crops specially the vegetable manufacturing, estimation

of domestic demand, determining the character of the market, integration of domestic and global markets, estimating growers profitability, figuring out the advertising and marketing channel and result consisting of their troubles and possibilities. Vegetable production without supervision causes poor quality production, high percentages of rejected vegetables due to poor post-harvest handling, rough transportation, and also related to the presenting irregular shape and size, different maturity indices, insects and diseases infestation, mechanical injury and moisture losses. Another cause for higher fees at the retail stage is the profit earned by middlemen, who play a vital function in Bangladesh in bringing fruits and veggies from manufacturers to markets. Ultimately, fees boom due to the absence of modern-day storage and transportation system. As a result, shops of fruits and vegetables gain larger profit margins, and the growers on common can get hold of very less. Most effective 71% and forty eight% of retail charges for end result and vegetables respectively in comparison in the case of cereals.

Tavassoli *et al.* (2021) develop a study on double frontier fuzzy network data envelopment analysis (FNDEA) model for assessing the sustainable supply chains. The proposed FNDEA model evaluates the optimistic and pessimistic sustainability of supply chains. The α-cut approach is used to solve the proposed models. The main contribution of this paper is to develop a novel double frontier FNDEA model in the presence of undesirable outputs. To demonstrate the applicability of the proposed approach, the sustainable supply chains of tomato paste are assessed.

Gazi (2020) found that about 75% of the population of Bangladesh is engaged in agriculture as their source of income. The primary purpose of this study is to analyze the overall logistics support for agro products in context of supply chain management in Bangladesh. The result reveals from the study that the agro products marketing in Bangladesh scrappy supply chain system, lack of transportation facilities, higher transaction cost, multiple market intermediaries, lack of awareness

and several other socio-economic problems facing agro products supply chain management in Bangladesh. Effective supply chain management helps to secure better position in the competitive environment and improve the efficiency of the agribusiness organization.

Anastasiadis *et al*. (2020) found that sustainable food supply chains are complex systems involving several stakeholders, processes, flow of goods/materials and information. The value generated in combination with the contradictory agendas among actors makes any groundwork for future research a challenging endeavor. Hence, an end-to-end mapping of the food supply chain under examination is a vital prerequisite for the design of a comprehensive research framework. This study exemplified such a mapping approach in the Greek sustainable tomato supply chain, providing significant insights for an impactful research agenda.

Mitra and Pradhan (2018) found that among various vegetables, tomato production in 2016 has reached 177042 thousand tons which hold about 60% of total world fresh vegetable production.

Willersinn *et al*. (2017) found there have been dramatic increases and rapid upscaling of modern cold storages in Bihar, one of the poorest states in India and an area where smallholders dominate. These investments have been triggered by market reform, investment subsidies, and better overall public service provision and governance. Almost all potato farmers, small and large, participate in cold storage and the availability of cold storages is associated with improved efficiency in value chains because of lower wastages even as a number of these cold storages have become involved in input, output, and especially credit markets. The increasing availability of modern cold storages has therefore led to important changes in potato value chains, with significant implications for smallholders.

Gunwant *et al.* (2015) resulted that the was conducted in the nainital and U.S nagar districts of uttarakhand .On an average the cost of cultivation per hectare of tomato was found Rs. 89005.00 and 74604.00 respectively.

Kumar *et al.* (2015) examinesthe marketing efficiency has been worked out total marketing cost and marketing margin involved in channel-I was Rs.100, Rs.466.42 in channel-II, Rs.731.19 in channel-III and Rs.154 in channel-IV. Since the marketing cost and marketing margin in channel-III was higher, the marketing efficiency was very low for channel-III. For channel-I, because ofsaving of marketing cost due to absence of market intermediaries and relatively low consumer's price, the marketing efficiency was higher. It was highest for channel-I i.e. 16.30% and lowest in channel-III i.e. 2.735%. Thus channel-I is more efficient than all other channel of marketing of vegetables.

Meena and Singh (2014) studies were conducted in jaipur and kota which were selected on the basis of highest area and production of tomato. There was no difference in marketable and marketed surplus of tomatoes to total marketing cost accounted for 18.20 per cent and marketing margin accounted for 31.80 per cent of consumer's rupee. In kota, producer's share in consumer's rupee was 52.73 per cent. Total marketing cost accounted for 18.21 per cent and marketing margin were 29.06 per cent of consumer's rupee.

Meena *et al.* (2014) conduct was undertaken in two districts of Rajasthan, viz., Jaipur and Kota districts. In this study it was found that 13543 quintal of tomato was produced bythe sample households, in which 13425 quintal was the marketed surplus. Due to perishable nature of vegetable, the farmers did not stock tomato for sale in lean months. Therefore, there was no difference in marketable and marketed surplus of tomato. Two marketing channels were found in marketing of tomato. In channel–I and channel–II, producer's share in consumer's rupee was 50.0 per cent and 47.27 per cent, respectively in Jaipur Market and 52.73 and 43.33%,

respectively in Kota Market. Marketing efficiency was 1.12 for channel-I and 1.07 for channel–II in Kota market. In case of Jaipur market marketing efficiency was 1.00 for channel-I and 0.76 for channel-II. ChannelI was found more efficient than channel II in all the markets of both districts in Rajasthan.

Hussein *et al*. (2013) analysis of marketing margin of tomato in the area of the study reveals that the sampled respondents had a marketing margin estimated at (2.69 SG/kg), (2.33 SG/kg) and (1.97 SG/kg) for wholesalers and (0.77 SG/kg), (0.67 SG/kg) and (0.75 SG/kg) for retailers in Khartoum, Madani and Sinnar, respectively. The proposed factors affecting marketing margins (i.e. transportation cost, packing cost, level of education and experience etc.) explained about 30% of variation of factors affecting marketing margin of respondents. Transportation cost forms the largest component of total marketing costs in both markets in the study area.

Khatun *et al.* (2012) studied at post-harvest loss assessment of tomato in some selected areas of Bangladesh. They found that absence of proper storage and marketing facilities, farmers are forced to sell their produces at throw away prices. Lack of storage facility, low price of tomato and unfavorable transportation system were the major problems at the farmers and traders level.

Kalash (2010) conducted a study which was carried out to analyses the marketing system of tomato in Lalitpur district of Nepal during the year 2010. Specifically, this study was intended to identify marketing channels, to estimate gross margin, marketing margin and producer share, to find out the situation of market information and to identify constraints related to production and marketing of vegetables, especially tomato. Accordingly, a representative sample size of 20 tomato growers comprising 10 each from Lamatar and Lubhu village development committees were purposively selected. Similarly, 10 wholesalers from Kalimati fruits and vegetables wholesale market and 10 retailers from Lagankhel vegetable market were

purposively selected. The required information was obtained by interviewing with semi structured questionnaire. This was supplemented with information from group discussion with farmer groups and key informants; and observation. The research showed that tomato growing is a profitable and potential agricultural enterprise in the research area.

Swaminathan *et al*. (2013) conducted on wholesale, retail and farmers' markets in Coimbatore to understand market efficiency, marketing efficiency (Shepherd's index) and price spread analysis of different vegetables. It revealed that the farmer's share in consumer's rupee was highest in wholesale market (72.23 per cent) followed by farmers' market (66.83 per cent) and retail market (60.33 per cent).The Shepherd's index was more tilted in the favour of farmer's market (3.33) and it was 3.03 and 2.07 in wholesale and retail markets respectively.

Akter and Islam (2011) analyzed economics of winter vegetables production in some selected areas of Narsingdi district, Bangladesh. The collected data was tabular and quantitative analyses were done to achieve the major objectives of the study. The major findings of the study revealed that production of all the selected vegetables were profitable. The per hectare gross cost of production of tomato, cauliflower and cabbage were Tk. 118000, 116977 and 120522, respectively and the corresponding gross returns were Tk. 217020, 210000 and 220000, respectively. The per hectare net returns of producing tomato, cauliflower and cabbage were Tk. 97000, 93023 and 99478, respectively. The study reported some problems and constraints which are related to production and marketing of these vegetables.

Haque *et al.* (2001) studied about adoption and profitability of BARI winter tomato in different districts in Bangladesh. They found that Raton and BARI hybrid tomato-5 variety were profitable than its competing crops potato, lentil and mustard. They investigate different problems of farmers. Non-availability of BARI tomato variety

seed at proper time, lack of technical knowledge, lack of storage facilities, infestation of insects and diseases were the major constraints of BARI tomato cultivation.

Concluding remarks

The above mentioned discussion and review indicate that most of the studies dealt with cost, return and profitability of tomato production. Some studies also determine the factors affecting the profitability. Maximum studies examined parameters, which influence production. Within this period changes might have taken place in production process, and owing to these changes, the validity of those factors needs to be looked into again. Side by side the influence of other factors identified by the researchers of other countries is needed to study in the context of Bangladesh. Very limited integrated studies were conducted on supply chain of tomato production in Bangladesh. Therefore, this study is expected to be conducted taking into account those aspects. The review of literature was helpful to re-design methodological aspects with a view to overcome the limitations of previous studies. From the above studies the researcher felt the need of conducting and analyzing the value chain of tomato production in Bangladesh within the current development context, which will help the policy makers to understand the current situation and take programmes to increase tomato production and improving the livelihood of people in Bangladesh. On the other hand, this researcher believed that the findings of this study would provide useful updated information, which would help the policy makers and researchers for further investigations.

CHAPTER III

METHODOLOGY

3.1 Introduction

The validity of farm control research is contingent upon the have a look at approach. Appropriate method is a precondition for doing sound studies. The design of every survey is largely governed by using the examines nature, cause and dreams. Additionally, it's miles contingent upon the availability of required resources, elements and time. There is an expansion of facts series techniques to be had for farm control studies. A farm commercial enterprise studies frequently includes the gathering of records from character farmers; facts collection for farm business analysis requires the analyst to use judgement in selecting records amassing techniques in the constraints given with the aid of the to be had sources for the assignment (Dillon and Hardaker 1993). The "survey approach" became used on these studies often for two motives: It lets in rapid evaluation of a big variety of instances; and ii. Its conclusions have a broader software. The number one downside of this method is that the investigator should depend on the farmers' recollection. To cope with this problem, frequent trips to the studies place have been performed to gather facts and within the occasion of any omission or contradiction, farmers were contacted to get the 'missing and/or accurate information. The following tiers were used in designing the survey for this investigation

3.2 Selection of the study area

Manikganj district was chosen purposively as a study area because this district is one of the renowned areas for tomato production in Bangladesh. Saturia upazila and Singair upazila was selected at random from the two upazila of Manikganj districts as the study area. An opening survey was carried on in some villages of Saturia and Singair upazila to collect primary knowledge about the tomato production,

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productivity and efficiency of the tomato growers. After preliminary visit three villages namely; Bangala, Boro Kaliakair, Choto Kaliakair and Sahebpara were selected randomly as the study area. Most of the farmers in these villages used to produce high yielding varieties of tomato and sell their product to different middlemen. The main criteria behind the selection of the upazila were as follows:

a. The selected upazila was a good tomato producing area.

b. The researcher is well-known with the language, living, beliefs and other socioeconomic characteristics of the villages of this upazila.

c. No study of this type was conducted previously in this area

Figure 3.1: Map of Manikganj District

3.3 Period of the study

The present study covered 12 months from January to December 2021. Data were collected during the period from February to April, 2021 through face to face interview with tomato growers and tomato traders using structured survey schedule. For collecting supplementary data the researcher personally visited the area.

3.4 Sampling Technique and Sample Size

Two criteria must be considered even as selecting samples for a research. The pattern lengths need to be as massive as viable at the same time as but offering enough ranges of freedom for statistical evaluation. On the other hand, field research management, fact processing, and evaluation must be achievable within the constraints of bodily, human, and monetary resources. However, due to the style of the technological and human environments, it is needed to pattern a representative pattern of the populace before drawing any conclusions. Due to time, economic, and manpower constraints, it become now not feasible to sign up all the study location's farmers. A total of 25 farmers had been selected at random. The modern-day studies used a functional random pattern approach to keep costs and time and to accomplish the take a look at's final objectives.

3.4.1 Selection of tomato growers

The tomato growers of the selected areas were considered as major part of the study. A list of tomato growers of the selected areas was prepared through a preliminary survey. Considering the limitation of time and fund, the sample size for tomato grower was fixed at 25, taking from the selected villages' i.e. Bangala, and Boro Kaliakair. Out of 25 selected growers, 10 from Bashaile and 10 from Bujarhati, 5 were from Choto Kaliakair and 5 from Sahebpara were selected in Saturia and Singair upazila of Manikganj district through simple random sampling technique by using random number table for the present study.

3.4.2 Value chain actor of tomato

Seventy value chain actors of tomato from each of two retail markets Bangala, Boro Kaliakair, Choto Kaliakair Bazar were selected from Singair upazila. In addition, Sahebpara was chosen from Saturia upazila of Manikganj district by applying purposive sampling technique for the present study.

In the selected areas tomato farmers and intermediaries were considered as the population of the study.

Table 3.1 Different actors and size of sample

Value chain actors	Sample size
Farmer	25
Faria	10
Bepari	10
Wholesaler	10
Retailer	15
Total	70

3.5 Preparation of the survey schedule

For this purpose, 5 separate types of interview schedules were prepared for collecting necessary data from different types of samples. An interview schedule contains questions about the production, marketing and disposal of tomato at the grower's level. An interview schedule was prepared for collecting data from tomato traders and including question related to buying and selling of tomato. The third number of interview schedule was prepared for obtaining data from owners and/or authorities of the selected plants relating to tomato preservation, pattern of plant utilization, expenditure incurred for it. All the schedules were pretested and finally prepared after careful modifications. Interview schedules were prepared on the basis of specific objectives of this study.

3.6 Data Collection

The researcher himself collected the relevant data from the selected samples through face to face interview. Before taking actual interviews the whole academic purpose of the study was clearly explained to the sample farmers and traders. Initially, they were hesitated to answer the questions; but when they were assured that the study was purely an academic one and it would not affect any way, they were convinced to cooperate with the researcher. At the time of interview, the researcher asked questions systematically and explained the question whenever it was felt necessary. Farmers were requested to provide correct information as far as possible. Many did not any records of their businesses and activities. This problem was confronted by memory recalling technique. Data were also collected from tomato traders like Faria, Bepari, wholesaler and retailer.

In addition to primary data, secondary data were also collected from various publication like journals, different organization like Department of Agricultural Marketing of Bangladesh and website searching.

3.7 Tabulation and Analysis of Data

The first step was taken to examine the data of each and every schedule to find out any changeability or omission in the data collection and to avoid irrelevant information. The data were edited carefully to eliminate possible errors contained in the schedules while recording information. Processed data were transferred to excel spread sheet and compiled with a view to facilitating tabulation. Information was collected initially in local units. After checking them these were converted into quantitative form by using suitable scoring. Necessary tables were prepared by shortening the data. The collected data were analyzed according to the objectives of the study. Inconsistencies in the data were removed. Analysis was done using the concerned software Microsoft Excel version.

3.8 Analytical Technique

An agribusiness study could be judged by the appropriate analytical technique. Data were analyzed with the purpose of achieving the objectives of the study. The probable techniques used were as follows:

3.8.1 Gross return and net return of the tomato grower

Gross return was calculated by multiplying the total volume of output of an enterprise by the average price in the harvesting period (Dillon and Hardaker, 1993). It consisted of sum of the volume of main product and by product. The following equation was used to estimate gross return:

$$GR = \sum Qm.Pm$$

Where:

GR= Gross return from product

Qm = Quantity of product

Pm=Average price of product

Net return was calculated by deducting all costs (variable and fixed) from gross return. To determine the net return of tomato production the following equation was used in the resent study:

Π= Gross return – (Variable cost + fixed cost)

Here,

Π= Profit per cycle

Gross return = Total production * per unit price of tomato

Variable costs,

- Production cost of tomato

Fixed costs,

- Land use cost

- Interest on operating capital Marketing cost of tomato

- License fee

- Loading and unloading

- Power and electricity charge

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- Mobile charge

- Market toll

- Transportation

- Personal expenses

- Unofficial payment

3.8.2 Marketing margin and net margin of value chain actors

The marketing margin and net margin of different value chain actors were estimated by the following formula:

- Marketing Margin=Sales price – Purchase price

- Net marketing margin =Marketing margin – Marketing cost

- Value Addition (%) $=\dfrac{\text{Sales price}-\text{Purchase price}}{\text{Purchase price}}$ x 100

- Interest on operating capital= Amount of operating capital× Interest rate (%)× Time required (in years) /2

- Variable cost of tomato production was considered as operating capital.

The important methods of measuring seasonal movements are

- Method of simple average;

- Ratio to trend method;

- Ratio to moving average method; and

- Link relative method

In the present study ratio to moving average method was applied to examine the price fluctuation of tomato considering the following factors.

a. It is an improvement over the ratio to trend method.

b. It is the most satisfactory and popular method and is widely used for estimating the seasonal variations because it eliminates both trend and cyclical components from the indices of seasonal variations.

3.9 Problems encountered in collecting data

Though the respondent tomato growers were available in the village, collection of required data was not an easy task. The researcher of the study had to face certain problems during data collections, which are noted below:

- Education of the respondents was a pre-requisite factor for having accurate data. Since most of the respondents were not well educated they were suspicious of outsiders and therefore, they were likely to be less co-operative;

- Some respondents did not keep any written records of the faring activities. Therefore, the researcher had to depend upon their memory;

- Respondents from all categories were often unable to recall the exact information, say, income, sales volume, cost, total production etc. Reliability of data therefore, posed some confuting;

- There was the limitation of time and personnel and inadequate information about tomato production and marketing aspects and for this reasons data and other necessary information had to be collected within the shortest possible time;

- Since the respondents remained busy at their work, they were not always available at home. For this, frequent visits were made to get information from them;

3.10 Primary data

Primary data were collected by the researcher through personal interview with the respondents. To get accuracy and reliability of data, care and caution were taken in data collection. The researchers took all possible effort to establish a congenial relationship with the respondents do not feel hesitation or hostile to provide correct data. Prior to interviewing, the objectives of the study were explained to each and every owner of the Tomato growers. As a result, they were convinced that the study was purely an academic one and was not likely to have an adverse effect on their business. During data collection an attention was also paid to the mood of the owners of the Tomato growers.

3.10.1 Questionnaire design

A questionnaire is a very effective assessment tool that allows the accumulating of records thru multi-dimensional questions. A questionnaire created without a clear goal and goal might usually ignore important subjects and waste the time of each enumerators and respondents via asking and responding to beside the point questions. All of those factors have been taken into consideration to the degree possible at the same time as constructing the survey questionnaire.

3.10.2 Pre-testing the questionnaire

The questionnaire became pre-tested to determine the period of time required to complete the i.e. Whether or not the information obtained through it turned into connected to the survey's universal aim and the months of March and April 2021. I picked randomly a few farmers to be responders.

3.10.3. Finalization of the questionnaire & method of data collection

After resolving all the modifications advised by the pre-check, the questionnaire turned into introduced to my supervisor. My supervisor also contributed considerably to the questionnaire. Eventually, I received permission to making specific questionnaire. A face-to-face interview became carried out in response to the questionnaire.

3.10.4 Data enhancing and coding

Editing and Coding of Data Other crucial aspects of the survey covered records editing and coding, which have been required for statistics processing. It should be achieved previous to the processing of information. Coding changed into finished simultaneously with questionnaire advent so as for the enumerator to sincerely and well mark an appropriate responses. The term "statistics editing" refers to the system of verifying and cleaning previously acquired data from the discipline.

3.11 Data Processing

Data processing included several procedures that were critical since they had an effect on the survey's findings. The following actions were conducted during data processing.

♦ Data entry

♦ Appending and merging files

♦ Data validation (further computer checking, editing, and imputation)

♦ Final decision on errors

♦ Completion of data processing and generation of data files

♦ Final documentations

♦ Conversion of data files to another software

♦ Storage of all files

3.12 Processing, tabulation and analysis of data

Manual enhancing and coding of the collected information befell. The acquired information turned into then meticulously compiled and analyzed. Additionally, information input becomes carried out electronically, and analyses have been performed using the correct equipment, Microsoft Excel and STATA. It ought to be remembered that statistics turned into first accumulated in neighborhood gadgets. After required assessments, it was converted to international preferred devices.

3.13 Problems faced during data collection

The researcher encountered a few difficulties when gathering data. These issues are summarized below:

i. The majority of respondents expressed hesitation in responding to the question, seeing that they'd in no way encountered this form of thinking earlier than. To clear up this trouble, a great deal effort was spent organizing report.

ii. It turned into hard to persuade respondents of the observer's use because of the reality that most of the people of respondents have been illiterate and uninformed.

iii. The respondents did not hold music in their business's economic transactions. As a result, it became rather hard for individuals to consider pertinent facts from their reminiscence the usage of the recall approach

iv. The respondents consistently avoided supplying correct data approximately the volume of their holdings and sales from tomato, believing that providing accurate statistics might result in accelerated taxes being imposed on them.

3.14 Estimation of costs and returns:

Present study envisioned the prices concerned and internet value of the produce. Variable prices like tunnel practice fee, land training fee, seed fee, seedling transplantation value, fertilization fee, hoeing price, pesticides price, earthling up cost, irrigation cost, choosing price and advertising and marketing value have been calculated. Tunnel value includes price of iron pipes or bamboos bought for setting up tunnel shape, iron cord value, string cost, nut bolt fee, polythene sheet price, cost of sheet for mulching, transportation fee for tunnel cloth and labor charges for tunnel preparation. Iron pipes, bamboos and iron wire used for multiple year because of their long existence. So, the depreciation cost turned into calculated for each material, that is used for more than one year as defined by means of Mwangi (2012). However, depreciation for low season tomato became calculated for 8 month due to the fact the common lifestyles span of low season tomato become eight months on common. Mwangi (2012) calculated the hobby on general preliminary funding fee and total variable fee. Therefore, interest on general initial investment price and total variable price become calculated at 8% hobby rate. Gross margin, net profits and advantage- value ratio had been calculated through the usage of formulation used by Usman *et al*. (2013) expressed as:

Gross Margin

$$GM=TR-VC$$

Where,

GM=Gross Margin

TR=Total Revenue

VC=Variable Cost

Net Income

NI=TR – TC

Where,

NI=Net Income

TR=Total Revenue

TC= Total Cost

CHAPTER IV
ACTORS INVOLVED IN VALUE CHAIN

4.1 Introduction

In tomato market attempts have been made to identify the actors in the tomato value chain to develop value chain map and to examine the value addition by tomato producers, value chain actors of tomato. Value addition is mainly interpreted as the difference between total expenses involved in making or buying of a commodity and the total revenue accruing from its sales. Value addition activities are mainly concerned with the changes of utilities. When product passes through distribution channels, it creates place, time and possession utilities. For this reason this chapter deals with identifying the actors involved in value chain and their functions of tomato marketing.

4.2 Actors involved in tomato value chain

The chain of actors through which the transaction of goods takes place between producer and consumer is known as a marketing channel. Marketing channels plays an important role in achieving the marketing objectives of any organization. Considering that tomato is an important vegetable in Bangladesh, the product moved from the sellers to consumers through the same chains i.e. through some market actors like Faria, Bepari, wholesaler and retailer. The study revealed that there had a movement of tomato from the point of production to the point of consumers through some actors forming a chain in the tomato market in the study area.

```
                          ┌──────────────┐
                          │    Farmer    │
                          └──────────────┘

  ┌──────────────┐      ┌──────────────┐      ┌──────────────┐
  │     Faria    │      │    Bepari    │──────│  Wholesaler  │
  └──────────────┘      └──────────────┘      └──────────────┘

  ┌──────────────┐                            ┌──────────────┐
  │   District   │                            │   Distance Market  │
  │   Wholesale  │                            │      (Dhaka,       │
  │    Market    │                            │  Chittagong,Sylhet)│
  └──────────────┘                            └──────────────┘

                                              ┌──────────────┐
  ┌──────────────┐                            │  Wholesaler  │
  │   Retailer   │                            └──────────────┘
  └──────────────┘
                                              ┌──────────────┐
                                              │   Retailer   │
                                              └──────────────┘

                  ┌──────────────┐
                  │   Consumer   │
                  └──────────────┘
```
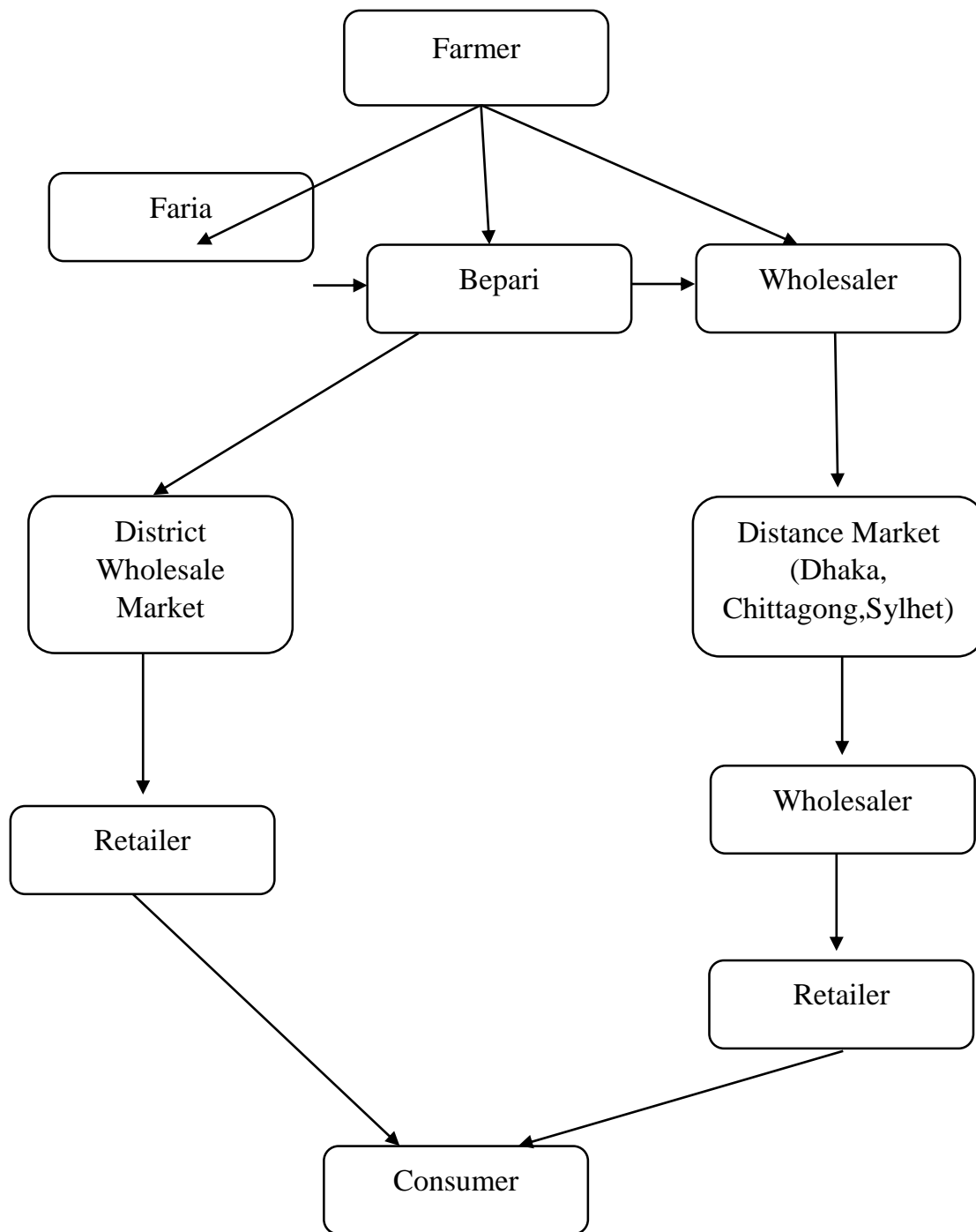
Figure 4.1: Value chain actors of tomato in Manikganj district and distant markets

From Figure 4.1, it is found that the tomato in Manikganj district is moved through the following chains:

Chain I: Farmer→ Faria → Bepari → District Wholesaler → Retailer → Consumer.

Chain II: Farmer → Bepari → District Wholesaler → Retailer → Consumer.

Chain III: Farmer → Faria → Bepari → Wholesaler → Distance Wholesaler →Retailer → Consumer.

Chain IV: Farmer → Bepari → Wholesaler → Distance Wholesaler→ Retailer →Consumer.

Chain V: Farmer → Wholesaler → Distance Wholesaler → Retailer → Consumer.

The analysis reveals that marketing of tomato in Manikganj district is moved from the hands of producers to the hands of consumers through five separate chains. Chain III is the longest value chain. In this chain the major marketing actors were the farmer, Faria, Bepari, wholesaler, distance wholesaler and retailer who added value in the marketing channels. They took a portion of margins at each stage of value addition activities.

It is clear that along with the farmers, a number of actors participated in the marketing of tomato from the production point to the consumer point. The main actors involved in the tomato value chain, their roles and inter relationships are discussed below.

The value chain actors perform the basic functions of the value chain. Typical actors of the tomato value chain in the studies include farmers, traders such as Faria, Bepari, wholesaler and retailer. They are in common become owners of the product at certain stage in the value chain of tomato marketing. The service providers are being subcontracted by the value chain actors.

4.3.1 Producer-seller

The producer-sellers were the farmers who after harvesting the produce performed the role of a seller in marketing tomato. Tomato producers were the main actor and played an important role in the tomato value chain. They produced tomato independently and sold them to the local traders or urban traders. In the study area the producers used to sell tomato to the market actors such as Faria, Bepari, and retailer either at the markets or at the farmyard.

4.3.2 Faria

The Farias were non-licensed traders. They were small traders and they handed relatively small volume of tomato than that done by other traders. They were independently organized. They had no permanent staff and permanent shop in the market and did their petty business in cash. More than half of the Faria was engaged in tomato trading for more than 5 years. The Faria purchased tomato from the farmers in the local market and sold it direct to Bepari and wholesalers in the same market.

4.3.3 Bepari

The Beparis were also non-licensed traders. The Beparis were relatively medium traders and they handled relatively larger volume of tomato than that done by other traders. They were independently organized. They had no fixed business premises. Most of the Bepari had no permanent shop and staff. Cage sale or purchase was very common practice for Bepari. There is strong competition among the Bepari at entry to this type of business is not rather easy. As a result, Bepari could not make high profit in their business. The Beparis were professional traders who purchased tomato from the farmers, Farias at the local market and sold it to district wholesalers and local wholesalers. They themselves financed their business and accepted loan in rare case.

4.3.4 Wholesaler

The wholesalers were licensed traders. The wholesalers were relatively big traders and they handled relatively larger volume of tomato than that done by the other traders. They had fixed business premises. Most of the wholesalers were independently organized and self-financed. They employed both labors and other staff on daily wage basis for performing various functions. They had no permanent staffs. The wholesalers purchased tomato from the producer, Bepari, Faria and sold it to the distance market (Dhaka, Sylhet, Chittagong, etc) through wholesaler in different markets. The wholesalers sometimes used to borrow money from different bank, NGO, other financial institute and other noninstitution (like friends and relatives and other traders) for a short period in rare cases. Among other things, space in the market was the important barrier to enter the wholesale market. In both the markets, there is an association of the wholesalers. Association acted as barriers to new entrants. They also involved in grading, sorting, washing and packaging of tomato.

4.3.5 Retailer

The retailers were the last link in the marketing of tomato. They were the specialized sellers who were directly connected with the consumers. Retailers were the small types of all traders. Sometimes, they purchased tomato from the wholesalers at the district level. They bought the tomato in small volume on the basis of open bargaining and sold it directly to the ultimate consumers at their retail shops. The retailers were the professional traders who used to sell their purchased tomato to consumers directly. Most of the retailers were independently organized having permanent shops usually in the open market place and labor for performing retailing activities. There were some retailers who had no permanent shop usually use open market place for their sale. Most of the retailers (both Manikganj) had been doing

business for more than 5 years. In spite of being self-financed they borrowed money from friends, relatives and other non-institutional sources at the time of need.

CHAPTER V

SOCIO-ECONOMIC CHARACTERISTICS OF THE TOMATO GROWER

5.1. Socioeconomic characteristics of tomato growers

This phase offers with the socio-financial traits of the pattern farmers. To get a whole and accurate situation of tomato generating farmers of a specific vicinity, it is required to understand these socio-financial characteristics. An effort has, therefore, been made in this chapter to describe briefly some of the basic socioeconomic characteristics of the sample farmers of the study area because people differ from one to another in many respects. Decision making behavior of an individual is determined by his socio economic characteristics. There are numerous interrelated and constituent attributes that characterize a person and these profoundly influence development behavior. Socio economic characteristics of the producers affect their production process and technology use. It is, however, not easy task to collect all the relevant information regarding the socio-economic characteristics of the sample farmers due to limitation of time and resources.

5.1.1 Age distribution of tomato growers

Total 25 samples were collected from four villages, Bangala, Boro Kaliakair, Choto Kaliakair, Sahebpara representing the whole population. Age of the farmers ranged from 30 to 75 years, the average being 48.45 years. All the variables were categorized on the basis of their possible scores except age was categorized based on the classification provided by the Ministry of Youth and Sports, Government of the People's Republic of Bangladesh. The distribution of the tomato farmers according to their age is shown in Table 5.1.

Table 5.1 Distribution of the farmers according to their age

Categories	Farmers		Mean (year)
	Number	**Percent**	
Young aged (30-35)	3	12.00	48.45
Middle-aged (36-50)	15	60.00	
Old (>50)	**7**	28.00	
Total	25	100	

Source: Field Survey, 2021

Table 4.1 showed that the highest proportion 60% of the farmers fell in the "middle aged" category, while 12% of them fell in the "young aged" category and 28% in the "old aged" category. The findings indicate that the majority of people in each neighborhood were between the ages of 40 and 70, as we discovered.

5.1.2 Composition of the Family Size

In this study, a family was defined as the total number of people who lived in the same kitchen and ate meals under the direction of a single family head, as described by the researchers. Families include the spouse, children, an unmarried young girl, the father, mother, sister and numerous other relatives who live with the family on a permanent basis, as well as extended family members who visit. The average family size of was 5.15.

Table 5.2 Family size of farmer

Particulars	All Farmers		National Average
	Number	Percent	Family Size
Male	5.5	53.40	4.4
Female	4.8	46.60	
Total	5.15	100	

5.1.3 Education

The education scores of the farmers ranged from 0 to 12. The average was 5.06. On the basis of their educational scores, the tomato growers were classified into four categories, namely "illiterate (0-0.5), primary (1-5), secondary (6-10), higher secondary (11-12) and above degree (above 12). This distribution was supported by Hoque (2016) and Masud, (2007) and shown in the Table 5.3.

Table 5.3: Education of the respondents by study area

Categories	Farmers		National average illiterate
	Number	**Percent**	
Illiterate (0-0.5)	6	24.00	
Primary (1-5)	4	16.00	
Secondary (6-10)	8	32.00	29.5%
Higher Secondary (11-12)	5	20.00	
Above degree (above 12)	2	8.00	
Total	25	100	

Source: Field Survey, 2021

Similar result was observed by Nasreen *et al.* (2013) where highest numbers of respondents were completed up to secondary education level. Table 5.3 indicated that the majority (32.0%) of the farmers had secondary level of education compared to 24% of them having illiterate. About 16% of the farmers were primary level education, while 20% had higher secondary level of education and 8% had above

degree. About 29.5% of the respondents were illiterate which is consistent with national average.

5.1.4 Farm size

The farm size of the respondents varied from 0.28 to 2.75 hectares. The average farm size was 1.13 hectare. The respondents were classified into three categories based on their farm size as followed by DAE (DAE, 1995): "small farm" (0.21 – 1.0 ha) and "medium farm" (1.0 -3.0). The distribution of the farmers according to their farm size is shown in Table 5.4.

Table 5.4: Farm size of the respondents by study area

Categories	Farmers		Mean
	Number	Percent	
Small farm (0.21-1.0 ha)	14	56.00	
Medium farm (1.01-3.0 ha)	8	32.00	
Large farm (above 3 ha)	3	12.00	1.13
Total	25	100	

Source: Field Survey, 2021

Table 5.4 indicated that more than half (56.0%) of the farmers possessed small farms and 32% of them having medium farms. Majority of the farmers were under small farmer's category which is consistent with national scenario.

5.1.5 Experience on tomato marketing

Experience on tomato marketing ranged from 10 to 50. The average was 26.67. On the basis of their knowledge, the farmers were classified into the following three

categories "low experience" (10-17), "medium experience" (18-33) and "high experience" (above 33). Table 5.5 contains the distribution of the farmers according to their experience.

Table 5.5: Farming experience of the respondents by study area

Categories	Farmers		Mean
	Number	Percent	
Low (10-17)	5	20.00	
Medium farm (18-33)	13	52.00	
High (>33)	7	28.00	26.67
Total	25	100	

Source: Field Survey, 2021

Table 5.5 showed that the majority of the 52.0% of the farmers had "medium experience" compared to more different than 28.0% of them having "high experience. The proportion of "low experience" was 20.0%.

5.1.6 Training on tomato cultivation

Training on tomato marketing ranged from 10 to 50. The average was 28.34. On the basis of their knowledge, the farmers were classified into the following three categories "Trained" and "Untrained". Table 5.6 contains the distribution of the farmers according to their training.

Table 5.6: Training experience of the respondents by study area

Categories	Farmers		Mean
	Number	Percent	
Trained (above10)	19	76.00	28.34

Untrained (0-10)	6	24.00	
Total	25	100	

Table 5.6 showed that the majority of the 76.0% of the farmers were "trained" compared to 24.0% of them were "untrained". The maximum farmer have enough training.

5.1.7 Source of tomato seed

The source seed of farmer was open market, neighboring farmer, own stock, seed selling center, BADC/BADC dealer and BARI.

Table 5.7: Source of tomato seed

Categories	Farmers	
	Number	Percent
Open market	5	20.00
Neighboring farmer	3	12.00
Own stock	9	36.00
Seed selling center	5	20.00
BADC/BADC dealer	2	8.00
BARI	1	4.00
Total	25	100.00

Table 5.7 showed that the majority of the 36.0% of the farmers were collected seed from own stock compared to 20.0% of them were collected seed from open market. The second highest 20.0% seed farmer collected seed from open market and seed

selling center. Farmer also collect tomato seed from neighboring farmer, BADC/BADC dealer and BARI 12.00, 8.00 and 4.00% respectively.

5.1.8 Cost and Return Analysis of Tomato Farmer

Table 5.8 Average production cost of tomato (tk/quintal)

Cost Items	Cost (Tk./ quintal)
A. Variable Cost	
1.Land Preparation	41.67
2. Seed	200.70
3. Labor cost	49.17
4.Organic Manure	61.91
5.Chemical Fertilizer	89.60
6.Insecticides	23.66
7.Weeding and earthing-up	17.08
8. Irrigation	24.17
9. Stalking	18.75
10. Other cost	31.25
Total variable cost	557.94
B. Fixed Cost	
1.Rented value of land	48.70
2.Interest on operating capital	27.90
Total Fixed cost	76.60

Total cost (A+B)	634.53

Table 5.9 After production cost:

Cost Items	Cost (Tk./100 kg)
1. Packing cost	12.12
2. Transportation cost	18.48
3. Loading and unloading	4.64
4. Market toll	5.00
5. Personal expense	14.3
6. Unofficial payment	21.49
Total cost	76.03

Summation of the costs of variable inputs made total variable costs, which was Tk. 557.94 per 100 kg of tomato. Summation of the costs of fixed inputs made total fixed costs, which was Tk. 634.53 per 100kg. Interest on operating capital was Tk. 27.90 per 100 Kg of tomato. Total production cost of tomato was Tk. 710.56 per 100 kg. The marketing cost of farmers included the cost of grading, washing and sorting, transportation, loading and unloading, market toll, personal expense, and unofficial payment. It was estimated per 100kg of tomato Tk. 76.03. If the marketing cost is included than total cost becomes Tk. 710.56 (Table 5.8).

Gross return was calculated by multiplying the total amounts of products by average sales price. It was seen that gross return per 100kg of tomato was Tk. 950 and Tk.

9.50 per kg respectively. Variable cost per 100 kg of tomato was Tk. 557.94 and Tk. 5.57 per kg respectively. Total cost per 100 kg of tomato cultivation (with marketing) was Tk. 710.56 and Tk 7.10 per kg respectively. Gross margin was obtained by deducting total variable cost from gross return. Gross margin per 100 kg of tomato was Tk. 392.06 and Tk. 3.92 per kg respectively. Net return was estimated by subtracting total cost from gross return. Net return per 100 kg of tomato was Tk. 239.44 Tk. 2.39 per kg respectively (Table 5.10).

Table 5.10 Profitability of tomato growers

Particulars	Tk. Per 100 Kg	Tk. Per Kg
i. Gross return	950	9.50
ii. Variable cost	557.94	5.58
iii. Total production cost	710.56	7.11
v. Gross margin (i-ii)	392.06	3.92
vi. Net return (i-iii)	239.44	2.39

Source: Field Survey, 2021

Farm gate price is that price which farmer gets through selling their produce at the farm yard. The average farm gate price of tomato was Tk. 900.0 per 100 kg. Average market price per 100 kg of tomato was Tk. 950. The estimated average marketing cost per 100 kg of tomato incurred by the farmers was Tk. 76.03. Value addition per 100 kg of tomato was Tk. 239.44 and Tk.2.39 per kg respectively. Among the value addition farmers covered the 25.16% of total value addition (Table 5.11).

Table 5.11 Value addition of tomato by tomato growers

Average farm gate price Tk. per 100 Kg	Market price Tk. per 100 Kg	Average marketing cost Tk. per 100 kg	Value addition Tk. per 100 Kg	Value addition Tk. Per Kg	Value addition (%)

| 900.0 | 950 | 76.03 | 239.44 | 2.39 | 25.16 |

5.2 Cost and Margin Analysis of Faria

The amount of average transaction per day of tomato by Faria was 1080 kg. Average total return of tomato was Tk. 11026.80 per day. The average purchase price per 100kg of tomato was Tk 950 and sales price was Tk. 1020.21and per Kg of tomato was Tk. 9.5 and Tk. 10.20 respectively. Value addition per 100kg of tomato was Tk. 29.00 and value addition per kg of tomato was Tk. 2.9 (Table 5.12).

Table 5.12 Daily transactions and value addition incurred by faria

Particulars	Amount (Kg)	Tk. Per Kg	Tk. Per 100 Kg	Total return (Tk.
Average Transaction (Per Day)	1080			
Average Purchase Price		950.00	9.5	
Average Sales Price		1020.21	10.20	11026.80
Value Addition		29.00	0.29	

Faria mainly sold tomato to the Bepari or wholesaler. After collecting tomato from the growers from the market they sold it directly to the Bepari or wholesaler. The estimated average marketing cost per kg of tomato incurred by the Faria was Tk. 0.29. Among the cost items market toll covered the highest cost representing 58.62% of total cost. The second highest cost item was personal expanses which was 17.24% of total cost. Among other cost items, unofficial expresses, mobile charge and others were 10.35%, 6.89% and 6.89% respectively (Table 5.13).

Table 5.13 Marketing cost incurred by faria

Cost Items	Cost (Tk./kg)	Percent
1. Personal expence	0.05	17.24
2. Market toll	0.17	58.62
3. Mobile charge	0.02	6.89
4 Unofficial expresses	0.03	10.35
5. Others	0.02	6.89
Total	0.29	100

The average purchase price per 100kg of tomato was Tk 950.00 and sales price was Tk. 1020.21 and it was Tk. 12.29 per kg, respectively. The amount of value addition per 100kg of tomato was Tk. 70.21 (marketing margin) and value addition per kg of tomato was Tk. 0.70. Among the value addition Faria covered the 7.37% of total value addition. The average marketing cost per 100 kg of tomato was Tk. 29.00. (Table 5.14).

Table 5.14 Value addition and marketing margin of tomato incurred by faria

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
i. Purchase Price	950.00	9.50	
ii. Sales Price	1020.21	10.20	
iii. Value Addition (ii-i)	70.21	0.70	7.37
iv. Marketing Cost	29.00	0.29	
v. Net Marketing Margin (iii-iv)	41.21	0.41	

Source: Field Survey, 2021

5.3 Cost and margin analysis of bepari

The amount of average transaction per day of tomato by Bepari was 3200 kg. Average total return of tomato was Tk. 40032.00 per day. The average purchase

price per 100kg of tomato was Tk. 1020.2 and per Kg was Tk. 10.20 and sales price per 100kg of tomato was Tk. 1251.13 and per Kg was Tk. 12.51. The amount of value addition per 100kg of tomato was Tk. 184 (marketing margin) and value addition per kg of tomato was Tk. 1.84 (Table 5.15).

Table 5.15 Daily transactions and value addition incurred by Bepari

Particulars	Amount (Kg)	Tk. Per 100 Kg	Tk. Per Kg	Total return (Tk.
Average Transaction (Per Day)	3200			
Average Purchase Price		1020.2	10.20	
Average Sales Price		1251.13	12.51	40032
Value Addition		184	1.84	

Source: Field Survey, 2021

Bepari mainly sold tomato to the local market wholesalers and district wholesale market. After collecting tomato from the growers and Faria they sold it directly to the end wholesaler. The estimated average marketing cost per kg of tomato incurred by the Bepari was Tk.1.84. Among the cost items transportation covered the highest cost representing 40.22% of total cost. The second highest cost item was personal expence of tomato which was 12.50% of total cost. Among other cost

Table 5.16 Marketing cost incurred by Bepari

Cost Items	Cost (Tk./kg)	Percentage
1. License	0.16	8.70

2. Loading and unloading	0.18	9.78
3. Transportation	0.74	40.22
4. Market cost	0.07	3.80
5. Grading	0.13	7.07
6. Mobile charge	0.05	2.72
7. Personal expenses	0.23	12.50
8. Unofficial express	0.17	9.24
9. Others	0.11	5.98
Total	1.84	100.00

Source: Field Survey, 2021

items, market toll, mobile charge and unofficial payment were 3.80%, 2.72%, 1.18% and 9.24% respectively (Table 5.16)

The average purchase price per 100kg of tomato was Tk. 1020.2 and sales price was Tk. 1251.10. The amount of value addition per 100kg of tomato was Tk. 230.92 (marketing margin) and value addition per kg of tomato was Tk. 2.31. Among the value addition Bepari covered the 22.63% of total value addition. The average market cost per 100 kg of tomato was Tk. 184.00 (Table 5.17).

Table 5.17 Value addition and marketing margin of tomato incurred by Bepari

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
i. Purchase Price	1020.2	10.20	
Ii. Sales Price	1251.10	12.51	
iii. Value Addition (ii-i)	230.92	2.31	22.63
iv. Marketing Cost	184	1.84	

v. Net Marketing Margin (iii-iv)	46.92	0.47	

5.4 Cost and margin analysis of wholesaler

The amount of average transaction per day of tomato by wholesaler was 8500 kg. Average total return of tomato was Tk. 155720 per day. The average purchase price per 100kg of tomato was Tk. 1251.10 and per Kg was Tk. 12.51 and sales price per 100kg of tomato was Tk. 1832.15 and per Kg was Tk. 18.32. The amount of value addition per 100kg of tomato was Tk. 581.05 (marketing margin) and value addition per kg of tomato was Tk. 5.81 (Table 5.18).

Table 5.18 Daily transactions and value addition incurred by wholesaler

Particulars	Amount (Kg)	Tk. Per 100 Kg	Tk. Per Kg	Total return (Tk.
Average Transaction (Per Day)	8500			
Average Purchase Price		1251.10	12.51	
Average Sales Price		1832.15	18.32	155720
Value Addition		581.05	5.81	

Wholesaler mainly sold tomato to the distance wholesaler. After collecting tomato from the farmer, Faria and Bepari sold it directly to the distances wholesale markets (Dhaka, Chittagong, Sylhet). The estimated average marketing cost per kg of tomato incurred by the wholesaler was Tk. 3.62. Among the cost items transportation cost covered the highest cost representing 25.45% of total cost. Among other cost

Table 5.19 Marketing cost incurred by wholesaler

Cost Items	Average cost (Tk./kg)	Percent of total cost
1. License	0.005	0.14
2. Loading and unloading	0.51	14.11
3. Transportation	0.92	25.45
4. Market cost	0.32	8.85
5. Grading	0.53	14.66
6. Mobile charge	0.28	7.75
7. Personal expenses	0.43	11.89
8. Unofficial expresses	0.37	10.24
9. Others	0.25	6.92
Total	3.62	100.00

Source: Field Survey, 2021

items license, loading and unloading, mobile cost, personal expenses, unofficial payment and others were 0.014, 14.11, 8.85, 11.89, 10.24 and 6.92% respectively (Table 5.19).

The average purchase price per 100kg of tomato was Tk. 1251.10 and sales price was Tk 1832.20. The amount of value addition per 100kg of tomato was Tk. 581.05 (marketing margin) and value addition per kg of tomato was Tk.5.81. Among the value addition wholesaler covered the 31.72% of total value addition. The average market cost per 100 kg of tomato was Tk. 361.5 (Table 5.12).

Table 5.20 Value addition and marketing margin of tomato incurred by wholesaler

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
Purchase Price	1251.10	12.51	

Sales Price	1832.20	18.32	
Value Addition (ii-i)	581.05	5.81	31.72
Marketing Cost	361.5	3.62	
Net Marketing Margin (iii-iv)	219.55	2.20	

Source: Field Survey, 2021

5.5 Cost and margin analysis of retailer

The amount of average transaction per day of tomato by retailers was 75.30 kg. Average total return of tomato was Tk. 1881.15 per day. The average purchase price per 100kg of tomato was Tk. 1831.57 and per kg of tomato was Tk.18.31 and sales price per 100kg of tomato was Tk. 2176.31 and per kg of tomato was Tk. 21.76. The amount of value addition per 100kg of tomato was Tk. 130.00 (marketing margin) and value addition per kg of tomato was Tk. 1.30 (Table 5.21).

Table 5.21 Daily transactions and value addition incurred by retailer

Particulars	Amount (Kg)	Tk. Per 100 Kg	Tk. Per Kg	Total return (Tk.
Average Transaction (Per Day)	86.45			
Average Purchase Price		1831.57	18.32	
Average Sales Price		2176.31	21.76	1881.15
Value Addition		130.00	1.30	

Source: Field Survey, 2021

Retailers mainly sold tomato to the ultimate consumers. After collecting tomato from the district wholesale market and they sold it directly to the end users. The estimated average marketing cost per kg of tomato incurred by the retailers was Tk. 1.30. Among the cost items license cost covered the highest cost representing 19.23

Table 5.22 Marketing cost incurred by retailer

Cost Items	Cost (Tk/kg)	Percent
1. License	0.25	19.23
2. Loading and unloading	0.14	10.77
3. Transportation	0.12	9.23
4. Market cost	0.11	8.46
5. Electricity charge	0.23	17.69
6. Mobile charge	0.13	10.00
7. Personal expenses	0.18	13.85
8. Unofficial express	0.04	3.08
9. Others	0.10	7.69
Total	1.30	100.00

Source: Field Survey, 2021

percent of total cost. The second highest cost item was electricity which accounted for 17.69% of total cost. Among other cost items loading and unloading, mobile charge, personal expenses and transportation were 10.77, 10.00, 13.85 and 9.23% respectively (Table 5.22).

The average purchase price per 100kg of tomato was Tk. 1831.6 and sales price was Tk. 2176.3. The amount of value addition per 100kg of tomato was Tk. 344.74 (marketing margin) and value addition per kg of tomato was Tk. 3.45. Among the value addition retailer covered the 15.84% of total value addition. The average market cost per 100 kg of tomato was Tk. 130 (Table 5.23).

Table 5.23 Value addition and marketing margin of tomato incurred by Retailer

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
Purchase Price	1831.6	18.32	
Sales Price	2176.3	21.76	
Value Addition (ii-i)	344.74	3.45	15.84
Marketing Cost	130	1.30	
Net Marketing Margin (iii-iv)	214.74	2.15	

Source: Field Survey, 2021

Table: 5.24 Value addition, marketing cost and net marketing margin of different market actors of tomato

	Value addition (Tk. per Kg)	Marketing cost (Tk. per Kg)	Net marketing margin (Tk. per Kg)
Faria	0.70	0.29	0.41
Bepari	10.20	0.70	0.29
Wholesaler	5.81	3.62	2.20
Retailer	3.45	1.30	2.15

Source: Field Survey, 2021

Following two diagrams (Figure 5.1 and Figure 5.2) were made according to the above table (Table 5.19).
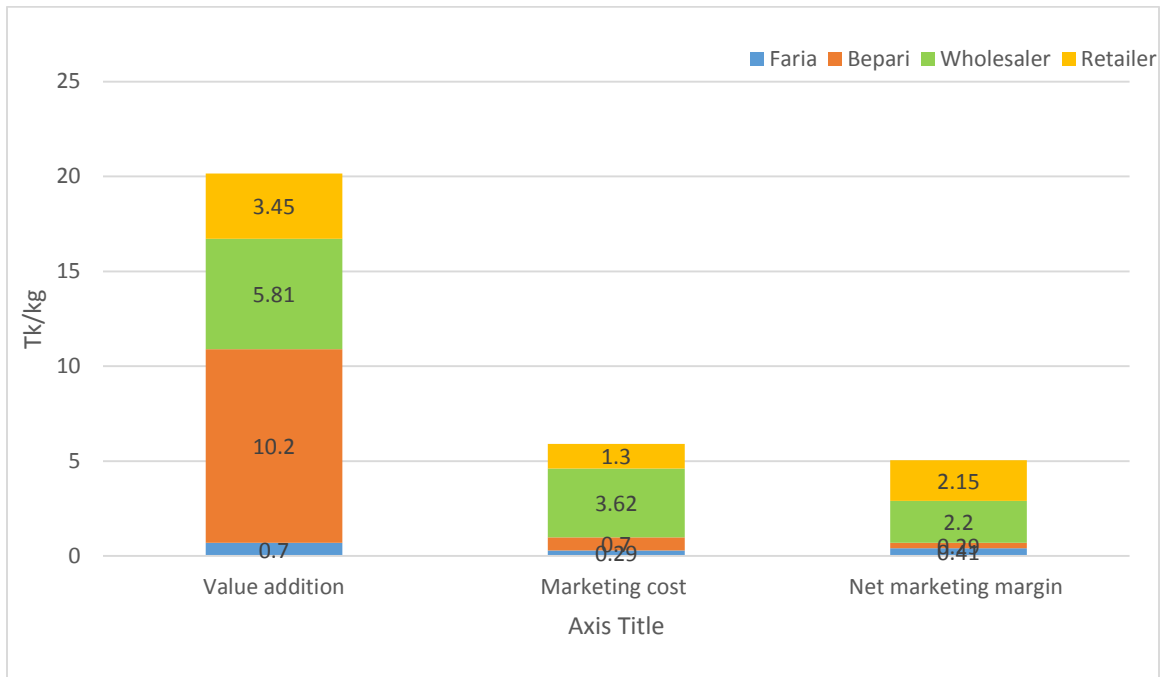
Figure 5.1: Value addition, marketing cost and net marketing margin of different market actors in tomato marketing

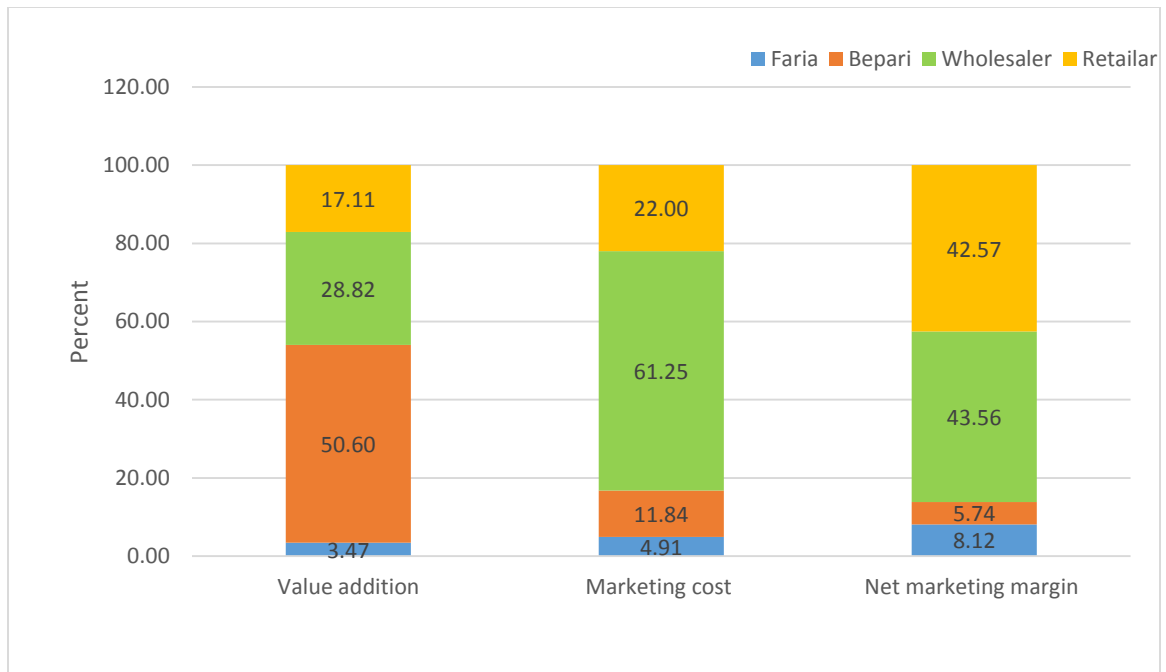Figure 5.2: Share of different actors in value addition, marketing cost and net marketing margin of tomato

Among the different actors, faria incurred lowest (in percentage) marketing cost but earning second highest net marketing margin (near to highest net marketing margin); on the other hand wholesaler incurred highest marketing cost but earning lowest net marketing margin (Figure 5.2).

CHAPTER VI

PROBLEMS OF TOMATO VALUE CHAIN

There were many problems which were faced by farmers and actors in the value chain of tomato. The problems that are faced by the selected farmers and actors in the production and marketing of tomato and the solutions to these problems as suggested by them are discussed below:

6.1 Problems faced by producers

The tomato producers in the study areas were facing various problems which are broadly classified into production problems and marketing problems. Some of the production problems were inadequate capital, diseases and pest attacks, shortage of good quality seed, lack of availability of adequate inputs and high cost of inputs. Marketing problems were related to transportation cost, lower price of tomato, shortage of marketing facilities and dominance of value chain actors etc.

6.2 Production problems

There were some major production problems faced by farmer. Those were as follows:

6.2.1 Inadequate capital

In the study areas tomato producers reported that production of tomato needs proper application of fertilizers, water and other inputs, in addition to special care with respect to timely agronomic practices. The production cost of tomato was high since input requirements were high. It was difficult to manage required capital on the part of the producers. The Table 6.1 shows that about 85% producers (out of 25 farmers) were faced inadequate of capital as a production problem.

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6.2.2 Diseases and pest attack

In the study areas disease and pest attack was a major problem which producers faced in tomato cultivation. They also reported that they were not well trained about pest and diseases control measure on their tomato cultivation. From Table 6.1 it was observed that about 70% producers (out of 25 farmers) were adversely affected in their tomato cultivation.

6.2.3 Lack of availability of adequate inputs

In the study areas producers also reported that lack of availability of adequate input was a major problem for tomato cultivation. Table 6.1 indicates that about 95% producers (out of 25 farmers) faced this problem.

6.2.4 Higher cost of inputs

In the study area, high cost of inputs was one of the most important problems faced by the producers in their tomato cultivation. Table 6.1 indicates that about 90% producers faced this problem.

6.1 Problem faced by farmers in production and marketing of tomato.

Problem faced by producers	Percent(%)
Production problem	
Inadequate capital	85
Diseases and Pest attack	70
Lack of availability of adequate inputs	95
Higher cost of input	90
Marketing problems	
High transportation cost	75
Low price of tomato	90
Dominance of value chain actors	70

Source: Field Survey, 2021

6.3 Marketing Problems

There are various marketing problem faced by value chain actors. Some major problems are discussed below.

6.3.1 High transportation cost

Transportation cost was very high in the study area. The primary and secondary markets were not directly connected with the villages. Due to high transportation cost and poor communication facilities, the farmers were bound to sell tomato in local markets at low prices. About 75% of producers stated that high transportation cost and inadequate communication facility were problem in transporting their produce to the markets (Table 6.1).

6.3.2 Low market price of tomato

All the sample actor reported that low price was a major problem in tomato marketing. Due to lack of remunerative price of tomato, the actors of the selected areas did not get fair returns from tomato cultivation. Table 6.1 shows about 90% producers faced this problem.

6.3.3 Lack of market facilities

In the study areas, there was no shed to protect the producers and their tomato from rain or sunshine and the producers had to sell their produce standing in the open place. So, lack of market facilities was mentioned as a problem by 70% producers (Table 6.1). Lack of pucca floor, drainage facility, supply of water and electricity in the market place also affected the farmers in selling tomato at the markets.

6.4 Measures Suggested Solving for the Problems

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The measures suggested by the producers for solving the above mentioned problems are as follows:

➢ Institutional credit facilities should be made available to the tomato farmers for increasing the volume of production. The Government should provide this facility through Bangladesh Krishi Bank (BKB) and other commercial banks.

➢ Adequate amount of inputs including HYV seeds should be supplied by the government at subsidized prices in the tomato producing areas.

➢ Transportation facilities should be improved in the study areas. On the basis of priority village roads should be developed at least brick bedded roads should be made so that the rickshaws or other motor vehicles can move easily. It would also help in reducing the transportation cost. Local Government administration may develop such facilities.

6.5 Problems Faced by Value Chain Actors

The measures suggested by the value chain actors for solving the above mentioned problems are as follows:

➢ Poor communication and transportation facilities is a marketing problem of tomato. A large amount of marketing cost was incurred by traders while carrying their tomato to the desired places due to poor communication and transportation facilities.

➢ Inadequate of capital is a major marketing problem. They had to borrow money from the non-institutional sources at high interest rate in some special moment.

➢ Inadequate marketing facilities is considered as a problem reported for value chain actors. There was no specific market place for tomato marketing, not to speak of shed and other market facilities.

➢ Market information played an important role in tomato trading. There was inadequate market information in tomato business.

6.6 Measures Suggested for Improving Marketing of Tomato

The problems stated by value chain actors always hampered the sound marketing of tomato. The value chain actors, who identified their problems, also provided some suggestions for improving the existing tomato marketing system.

➢ The value chain actors needed much more cash money for conducting their businesses. They suggested that provision should be made by the Government for adequate and easy loan from institutional sources against the security of their produce.

➢ The value chain actors suggested especially for the improvement of transportation as well as communication system in the study area. Availability of adequate number of transports would also increase marketing efficiency by lowering cost.

➢ The price of tomato in different terminal markets should be disseminated through radio, television and newspapers which could reduce the uncertainty of price. To ease the communication system to different terminal markets necessary effort should be taken to reduce marketing cost.

➢ High rate of transportation cost was a serious problem for tomato business. So, the value chain actors suggested that reasonably low rate of commission and tax should be charged for marketing their tomato.

➢ Other remedial measures which would greatly facilitate the marketing operation in the study areas including building pucca floor in the market place, electric connection to the market places, and dissemination of market information were also suggested by the value chain actors.

CHAPTER VII

SUMMARY, CONCLUSION AND RECOMMENDATION

7.1 Summary of Findings

Bangladesh has made a breakthrough in vegetable production but due to lesser efforts in market creation, farmers are facing a low prices situation. In Bangladesh both the poor and the rich people use tomato as food as well as vegetable. Therefore, its potentiality for solution of chronic food problem of the country cannot be under estimated. Tomato as a cash crop is grown for both sale and consumption. This crop has the desirable characteristics of high yield, nutritious and a palatable food item. A large number of people are involved in the production and marketing of tomato. A number of actors like faria, bepari, wholesaler and retailer are involved in the value chain of tomato marketing system. They played an important role in moving tomato to the consumers but at cost sharper the present study investigate different value chain in which the actors acted as intermediate with their cost and margins. The study caused lights on the following specific objectives.

- To identify the actors involved in value chain and their function in tomato marketing;
- To estimate the value addition of tomato by the actors in tomato market;
- To identify the constraints of tomato marketing and suggest measure for the improvement of tomato marketing in the selected area.

The study was confined to a particular area where tomato production was concentrated. The study was confined to two villages in the Sirajdikhan Upazilla of Manikganj district. The villages were purposively selected for collecting data from the tomato farmers. For convenience, the sample size of farmers was fixed at 25 from four villages. Out of the total 25 farmers, 10 were collected from Bangala

village and 5 were collected from Boro kaliakair, 5 were collected from Choto kaliakair and 5 were from Sahebpara village in Singair and Satuaria Upazilla. Data were also collected from some actors who worked in the valuation of marketing of tomato in study areas. The actors involved in the marketing of tomato included Farias, Beparis, wholesalers and retailers. A total of 45 actors including 10 Farias, 10 Beparis, 10 wholesalers from Sirajdikhan upazila and 15 retailers from Munshiganj sadar in some selected primary markets were selected purposively for the study. Primary data were collected from the respondent farmers and different actors by using separate interview schedules. Secondary data were collected from various books, Journals, different organization like Department of Agricultural Marketing of Bangladesh, website searching and government publications. Both the tabular and descriptive techniques were used for analyzing data.

Considering that tomato is an important vegetable in Bangladesh, the product moved from the sellers to consumers through several changes i.e. through some market actors such as faria, bepari, wholesalers and retailers, since tomato needs to move a long distance from the point of production to the consumers.

In Saturia and singair Upazila tomato is moved from the hands of producers to the hands of consumers through five separate chains. Chain III is the longest marketing chain. In this chain the major marketing actors were the Farmers, Farias, Beparies, wholesalers, distant wholesalers and retailers who performed value adding functions and took a portion of marketing as their tomato.

Farm gate price of tomato received by farmers per 100Kg was Tk. 900.00 and highest purchase price per 100Kg of tomato paid by retailers was Tk. 1831.57. Highest sales price per 100Kg of tomato as received by retailer was Tk. 2176.31 and the lowest sales price as received by farmers was Tk. 950.00.

Interest on operating capital for farmer was TK. 27.90 per 100Kg of tomato. Gross return, gross margin and net return received by farmer per 100Kg of tomato was Tk. 950, Tk. 392.06 and Tk. 239.44, respectively.

Highest average transaction of tomato received by wholesaler was 8500 Kg per day and lowest average transaction of tomato received by retailer was 86.45 Kg per day. Highest marketing cost received by wholesaler was Tk. 361.50 per 100Kg of tomato and lowest marketing cost received by Faria per 100Kg of tomato was Tk. 29.00.

Among the value addition highest value added by wholesaler per 100Kg of tomato was Tk. 581.05 of total value addition and lowest value added by Faria per 100Kg of tomato was Tk. 70.21 of total value addition. As a percentage form of value addition highest value added by wholesaler was 31.72% and lowest value added by Faria was 7.37% of the total value addition.

Farmers of both study areas faced many problems in the production and marketing of tomato. The major problems faced by them included lack of capital, shortage of good quality seed, disease and pest attack, lack of availability of adequate input, low price of tomato, transportation problem and shortage of market facilities and dominance of value chain actors.

The study identified some major problems faced by the actors in the tomato value chain. The major problems faced by them included lack of capital, unavailability of loan, high interest rate, high transportation cost, inadequate communication facilities, low price and inadequate marketing facilities.

7.2 Conclusion

Based on the findings of the study it can be concluded apparently that considerable scope exists to increase the productivity of tomato and to develop the value chain. Expanded tomato cultivation can upgrade the living standard of the function areas of value chain.

Tomato is not only a source of nutrients but also a source of cash income for farmers. A large number of people are involved in the production and marketing of tomato. So, the farmers and actors could certainly be benefited financially if production and marketing system of tomato are well developed.

For stabilizing tomato prices, forecasting of tomato prices and target production should be made in time before sowing, so that the farmers can adjust tomato acreage accordingly. With successful operation of a buffer stock, price instability may be reduced. Government intervention in tomato marketing is necessary to ensure fair price to the farmers by controlling such unexpected price fluctuations.

Farmer engaged in tomato production was not very solvent to make the full utilization of value chain opportunity. Credit facilities should be made available at low interest rate by government. Processing opportunities were not available in the study area. Some local and traditional methods were applied by the processor. So, if there were any technological and financial support in processing industries more value could be added efficiently. Lack of timely and proper market information was a great problem. So, market information should be available and ease accessible for the producers also for other value chain actors.

Finally agro-processing industries especially for study area were badly needed. For making efficient value chain of tomato marketing all the actors including farmer should have proper knowledge, financial assistance and also good transportation system.

7.3. Recommendation

On the basis of the salient findings of the study, certain broad implications that can be derived for policy makers and extension personnel to design suitable development strategy for increasing the tomato production in the study area are indicated here:

- ❖ For increasing production of tomato necessary inputs particularly HYV seeds, Fertilizers, insecticides and pesticides etc. should be made available to the farmers just before the growing period.

- ❖ To reduce the cost of seed it will be necessary to produce sufficient quality seeds locally and make them available to the farmers in time at a reasonable d price.

- ❖ Reduction of transportation cost and damage/wastage of product may help to be more profitable for intermediaries.

- ❖ As a perishable product tomato should delivered to consumer as quick as possible.

- ❖ To increase efficiency in marketing process the number of intermediaries involved in marketing should be decreased.

- ❖ Market facilities are not available in Bangladesh. Markets are not available in in the season for tomato. Market facilities have to be increased in Bangladesh for improving the tomato production and development.

- ❖ Value chain actors in the study area were small in number but they were well organized. Whereas the farmers were scattered but in large number. The value chain actors always dominated the marketing system and they were in better position in setting the prices of tomato. As a result most of the producers were compelled to sell their tomato at a lower price because there was no way to bring back the product from market as it involved extra cost of transportation and risks of tomato damage. Value chain actors dominancy have to be reduce.

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Interview Schedule

A. Interview Schedule for Farmer

Serial No: [_____]   Date: [_____]

1. Area:

Name of farmer……………………………………………… Age..……………..

District:……………………………Upazila:…………………………………...

Union/Pourashava…………………… Village/Road:………………………..

Mobile No……………………………………………………………………………

2. Family size………..

Male:………………… Female:………………………………………

3. Educational Qualification (put √ mark):

☐ Illiterate ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Above degree

4. Types of farm:

Types of land	Area (Ha)
Small farm (0.21-1.0 ha)	
Medium farm (1.01-3.0 ha)	
Large farm (above 3 ha)	

5. Experience of tomato marketing...Years

6. Have you got training on tomato cultivation? (Put √ mark):

☐ Yes   ☐ No

If 'Yes', how many times?...

7. What is the source of tomato seeds? (Put √ mark):

☐ Open market (01) ☐ Neighboring farmer (02) ☐ Own stock (03)

☐ Seed selling center (04) ☐ BADC\BADC dealer (05) ☐ BARI (06)

6. Cost of tomato's cultivation

Cost Items	Cost (Tk./ha)
Variable Cost	
1.Land Preparation	
2. Seed	
3. Labor Cost	
4.Organic Manure	
5 .Chemical Fertilizer	
6.Insecticides	
7.Weeding and earthing-up	
8. Irrigation	
9. Stalking	
10. Other cost	
Fixed Cost	
1.Rented value of land	
2.Interest on operating capital	

7. After Production cost:

Cost Items	Cost (Tk./ha)
1. Packing cost	
2. Transportation cost	
3. Loading and unloading	
4. Market toll	
5. Personal expense	
6. Unofficial payment	

8. Problem face by tomato farmer:

9. Solutions:

10. Production of fresh tomato in this year (Kg.):

Interview Schedule

B. Interview Schedule for Faria

Serial No: ⬚   Date: ⬚

Location of faria:

Name of faria……………………………………… Age..…………..……..

District:……………………………Upazila:………………………............

Union/Pourashava………………… Village/Road:………………………..

Mobile No…………………………………………………………………………

1. Educational qualification of faria (Put √ mark):

☐ Illiterate ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Above degree

2. When did you start your business?

3. Does the price vary for different sellers? (Put √ mark):

Yes ☐   No ☐

5 Cost of Tomato Purchase (Farmer / Faria / wholesaler):

Cost Items	Cost(Tk./ha)
1. Personal expence	
2. Market toll	
3. Mobile charge	
4 Unofficial expresses	
5. Others	

7. Where do you sell your tomato?

8. How do you set selling price?

a) Purchase + cost + fixed amount of profit

b) Price set by government

c) Market price

d) Other

9. What are the main problems of your business?

10. What are the solutions?

Signature: _____ Date: _____

Interview Schedule

C. Interview Schedule for Bepari

Serial No: [   ]   Date: [   ]

1. Location of bepari:

Name of faria…………………………Age..…………..….. ………………….

District:……………………….Upazila:…………………….....................

Union/Pourashava…………………..Village/Road:…………………………..

Mobile no………………………………………………………………… …….

2. Educational qualification bepari: (Put√ mark):

☐ Illiterate ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Above degree

3. When did you start your business?

4. From where do you buy tomato? (Put √ mark):

☐ Farmer ☐ Faria ☐ W.S ☐ Aratdar

5. Does the price vary for different sellers? (Put√ mark):

Yes ☐   No ☐

6. Cost of Tomato Purchase (Farmer / Faria/ wholesaler):

Cost Items	Cost (Tk./ha)
1. License	
2. Loading and unloading	
3. Transportation	
4. Market cost	
5. Grading	
6. Mobile charge	
7. Personal expenses	
8. Unofficial express	

9. Others	

7. Where do you sell your tomato?

8. How do you set selling price?

a) Purchase + cost + fixed amount of profit

b) Price set by government

c) Market price

d) Others

9. What are the main problems of your business?

10. What are the solutions?

Signature: Date:

Interview Schedule

D. Interview Schedule for Wholesaler

Serial No: ☐   Date: ☐

1. Location of wholesaler:

Name of wholesaler…………………………………….…Age.…………..…..

District:……………………………Upazila:……………………...……………..

Union/Pourashava…………………… Village/Road:………………………..

Mobile No…………………………………………………………………………..

2. Educational qualification of wholesaler (Put √ mark):

☐ Illiterate ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Above degree

3. When did you start your business?

4. From where do you buy tomato? (Put √ mark):

☐ Farmer ☐ Faria ☐ W.S ☐ Aratdar

5. Does the price vary for different sellers? (Put √ mark):

Yes ☐   No ☐

6. Cost of Tomato Purchase (Farmer / Faria / wholesaler):

Cost Items	Cost(Tk./ha)
1. License	
2. Loading and unloading	
3. Transportation	
4. Market cost	
5. Grading	
6. Mobile charge	
7. Personal expenses	

8. Unofficial expresses	
9. Others	

7. Where do you sell your tomato?

8. How do you set selling price?

a) Purchase + cost + fixed amount of profit

b) Price set by government

c) Market price

d) Others

9. What are the main problems of your business?

10. What are the solutions?

Signature: Date:

Interview Schedule

E. Interview Schedule for Retailer

Serial No: [_____]   Date: [_____]

1. Location of Retailer:

Name of retailer………………………………………… Age...…………..……

District: ……………………………Upazila: ……………………….............

Union/Pourashava………………… Village/Road: ………………………..

Mobile no………………………………………………………………………

2. Educational qualification: (Put√ mark):

☐ Illiterate ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Above degree

3. When did you start your business?

4. From where do you buy tomato? (Put √ mark):

☐ Farmer ☐ Faria ☐ W.S ☐ Aratdar

5. Does the price vary for different sellers? (Put√ mark):

Yes ☐   No ☐

6. Cost of Tomato Purchase (Farmer/ Faria/ wholesaler):

Cost Items	Cost (Tk./ha)
1. License	
2. Loading and unloading	
3. Transportation	
4. Market cost	
5. Electricity charge	
6. Mobile charge	
7. Personal expenses	
8. Unofficial express	

9. Others	

7. Where do you sell your tomato?

8. How do you set selling price?

a) Purchase + cost + fixed amount of profit

b) Price set by government

c) Market price

d) Others

9. What are the main problems of your business?

10. What are the solutions?

 Signature: