

**VALUE CHAIN ANALYSIS OF POTATO IN THE SELECTED AREAS OF
THAKURGAON DISTRICT IN BANGLADESH**

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**VALUE CHAIN ANALYSIS OF POTATO IN THE SELECTED AREAS
OF THAKURGAON DISTRICT IN BANGLADESH**

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CERTIFICATE

This is to certify that the thesis entitled “**VALUE CHAIN ANALYSIS OF POTATO IN THE SELECTED AREAS OF THAKURGAON DISTRICT IN BANGLADESH**” submitted to the department of Agribusiness and Marketing, Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Sher-e-Bangla Nagar, Dhaka in partial fulfilment of the requirements for the degree of **Master of Science (MS) in, Agribusiness and Marketing** embodies the result of a piece of bona fide research work carried out by **MD. RUKUNUZZAMAN, Registration No. 11-04515** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

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*DEDICATED
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VALUE CHAIN ANALYSIS OF POTATO IN THE SELECTED AREAS OF THAKURGAON DISTRICT IN BANGLADESH

ABSTRACT

The study was conducted to value chain analysis of potato in the selected areas of Thakurgaon district in Bangladesh. Besides, attempt had given to examine the actors involved in value chain, and to estimate the value addition of potato by the actors in potato market in the study area and to identify the constraints of potato marketing and suggest measure for the improvement of potato marketing in the selected area. Thakurgaon districts were selected purposively for the study on the basis of extensive potato production. A total number of 30 potato cultivators were randomly selected to conducting farm level survey with pre-tested questionnaire. Data were collected during August to September, 2019. The selected samples included 60 (faria-15, bepari-15, wholeseller-15, and retailer-15). In the study areas there are five value chain included. In this study cost and margin analysis of potato, cost of production, variable cost, fixed cost, gross cost, gross return, gross margin, net return, value addition, marketing cost, storage cost, market price calculated. Value addition of retailer is 22.15 percent, wholesaler is 29.63 percent, bepari is 20.28 percent and faria is 27.94 percent. Marketing cost of retailer is 20.18 percent, wholesaler is 45.32, bapari is 29.91 and faria is 4.59 percent. Net marketing margin of retailer is 24.19 percent, wholesaler is 13.33, bapari 10.29 percent and faria is 52.19 percent. Proper credit facility, fertilizer supply, seed supply, irrigation facilities, electricity supply and transport facility should be improve for potato development in Bangladesh.

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ABBREVIATIONS

DAE	Department of Agricultural Extension
U.S	United States
FAO	Food and Agricultural Organization
BBS	Bangladesh Bureau of Statistics
BB	Bangladesh Bank
SPSS	Statistical Package For Social Sciences
BCR	Benefit Cost Ratio
CFI	Constraint Faced Index
NGOs	Non-Governmental Organizations
BARI	Bangladesh Agricultural Research Institute
TC	Total cost
GR	Gross returns
TVC	Total variable costs
GOs	Government Organizations
FC	Fixed cost
HYV	High Yielding Varieties

CHAPTER I

INTRODUCTION

1.1 General Background of the Study

Potatoes are edible tubers, available worldwide throughout the entire year. They are relatively cheap to grow, rich in nutrients, and they can make a delicious treat. The humble potato has fallen in popularity in recent years, due to the interest in low-carb foods. However, the fiber, vitamins, minerals, and phytochemicals it provides can help ward off disease and benefit human health. Potatoes were first domesticated in the Andes in South America up to 10,000 years ago. Spanish explorers introduced them to Europe in the early 16th century (Islam, 2009).

They are now the biggest vegetable crop in the United States (U.S.), where the average person eats 55 pounds, or 35 kilograms (kg) of potatoes every year. They are an important staple food in many countries around the world (Lutaladio *et al.*, 2009)

The potato is the world's most significant root and tuber crop. It is grown in more than 125 countries and consumed almost daily by more than a billion people. Hundreds of millions of people in developing countries depend on potatoes for their survival (Lutaladio *et al.*, 2009). In sixteenth century potato was introduced in this subcontinent. It was grown then in tiny plots as a vegetable. Potatoes have been grown in Bangladesh since at least the 19th century (Islam, 2009). By the 1920s, the first commercial production of the crop was established in the country (Islam, 1983). In Bangladesh potato occupied the first position among all the vegetables in respect of area coverage and production and contributed 65.65 percent of the total production of vegetables in Bangladesh in 2019 (BBS, 2019). In 2017-18, the area coverage (5.3 lakh hectare), production (89.5 lakh MT) and yield (18.4 t/ha) of potato were comparatively higher. Simultaneously export also increased sharply during this time. Considering the area coverage in the country, potato is the third major crop after paddy and wheat (Mukul *et al.*, 2004).

The study conducted by (Akter *et al.*, 2001) showed that potato production was highly profitable and it could be provide cash money to farmers. In terms of profitability, potato production was more attractive than any other winter vegetables. Per unit yield and gross return of potato were found higher than other competitive crops. Innumerable individuals in Bangladesh is legitimately and by implication relied upon potato generation and showcasing. There is a worth chain framework engaged with potato showcasing in fact. A progression of significant worth creating exercises related with item promoting from ranch level to a definitive customer alluded to as the worth chain. In Bangladesh potato esteem chain beginning from maker then there may have numerous mediators like Faria, Bepari, Wholesaler, and Retailer. Worth chain investigation distinguishes the reasons for value variety or ascending of potato value, make proper showcasing procedure and estimating strategy of potato (Saiyem, 2007). Most agrarian items are portrayed by some regularity underway emerging from climatic elements and the natural development of the plant (Tomek *et al.*, 1997).

However, due to the seasonality in production, temporal price variation is more prominent for perishable commodities than many other agricultural products. Fluctuations of price create uncertainty about the market prices and hence risk in production. The biological nature of agriculture production is the principle cause of price instability (Tomek *et al.*, 1990).

In Bangladesh, potato is mainly consumed as vegetable. Various other food items are also made from potato. Adequate supply of potato stabilizes the vegetable market all-round the year (Dillon *et al.*,1993). Recently, the government has been trying to diversify food habits and encourage potato consumption to reduce pressure on rice. Therefore, potato is becoming an important food for food security in Bangladesh. Therefore, stability of price is an important factor in taking economic decisions in agriculture.

Potato-growers of Thakurgaon district, which is known as the country's one of the key potato farming zone, are fast losing interest in the crop, as a steady fall of its prices has hit them hard in the last couple of years. Thakurgaon is known for its fertile land and this

region is one of the prime potato cultivation hubs in the country. In spite of the district’s proximity to the capital, potato farmers of Thakurgaon have abandoned their full-grown crops in field to avert further losses seen at the end of the farming session.

“This year we have cultivated potato with the hope that we would be able to recover the losses incurred in the previous year,” Farmers said. “Our recovery dream is shattered as the prices have started falling this year,” he said. According to field-level pricing of freshly harvested potato, traders are offering only Tk. 250 a sack of 40 kg potatoes, whereas, last year, the same was priced at Tk. 350.

Table 1.1: Potato production in Bangladesh

Year	Cultivable Land (in lakh hectares)	Production (in lakh hectares)	Export (in tones)
2012-2013	4.44	86.03	28,416
2013-2014	4.62	89.50	102,983.564
2014-2015	4.71	92.83	90,490.967
2015-2016	4.75	94.47	40,239.405
2016-2017	4.99	102.16	55,652.38
2017-2019	4.77	97.44	53,485.639
2019-2019	4.69	109	27,811.602 (till April)

Source: (DAE, 2019)

“This is a straight loss of Tk. 100 on every sack of potato,” rued farmers. Local farmers and agriculture experts told The Independent that in spite of bumper production, lack of capacity in local cold-storages and manipulations in trading are driving potato farmers to look for other crops. There are 69 cold-storages in the area, which can store less than one-third of the production. All these cold-storages are run by private owners only too willing to exploit farmers in case of a bumper crop. Farmers is expecting to harvest nearly 1, 000

mounds of potatoes, but he is reluctant to do it as he could see the loss. “I incurred losses to the tune of Tk. 2 laky on the 300 sacks of potatoes I stored last year,” he added.

In absence of any state-run cold storage in Thakurgaon district, farmers alleged that private owners arbitrarily increase storing charges. “Even stored potatoes sometimes suffer heavy damage and we don’t get any compensation for the damage,” said another farmer of the district. In order to store a sack (containing 80 kg) of potato, farmers have to spend about Tk. 400 including Tk. 250 as cold-storage charges. At the end of a season, they have to sell the stored potato at above Tk. 650 a sack to make profits. “But with the production cost for a ton of potato soaring to Tk. 400 now, we have to sell a sack of potatoes at Tk. 1200 to avoid losses,” farmers explained.

Besides, cold-storage charges have gone up from Tk. 160 in 2009 to Tk. 250 this year. According to district agriculture office, farmers of Thakurgaon have cultivated potato in 38,006 hectares this year, which comprises almost 60 per cent of the district’s total cultivable land. It is 1,336 hectares more than the previous year’s area of cultivation. Local farmers said private owners would not be able to increase storage charges every year if there are government-run cold-storages.

In Bangladesh, potato is particularly fed on as vegetable. Various different meals items are also made from potato. Adequate supply of potato stabilizes the vegetable market all-round the 12 months (Moazzem *et al.*, 2004). Recently, the authorities has been trying to diversify meals behavior and encourage potato intake to lessen pressure on rice. So, potato is becoming an essential food for food protection in Bangladesh. Therefore, stability of rate is a crucial component in taking monetary choices in agriculture.

1.2 Value Chain

The value chain concept was developed and popularized in 1985 by Michael Porter, in “Competitive Advantage,” a seminal work on the implementation of competitive strategy to achieve superior business performance. A broad definition of value addition is to economically add value to a product and form characteristics more preferred in the

market place. There are two main types of value addition. The one is innovation and the other is coordination. Innovation focuses on improving existing processes, procedures, products or services. The enhancement added to a product or service by a company before the product is offered to customers. Different economist defined value chain in different ways. Some of the definitions are given below.

Humphrey (2002) maps out a concise description of the value chain approach based on few basic ideas:

- Products pass through a value chain or sequence of activities, with value added in each stage from design to transforming inputs, reaching to final market;
- Increased globalization has contributed to the dispersal of these activities over greater distances; and
- In chains dominated by the increasing concentration and clout of retailers, value is increasingly derived by product differentiation and innovation that reduces cost and enhances the importance of reliable supply.

In case of agricultural commodity e.g. focus on various value adding opportunities to ensure better potato as well as demand supply equilibrium. Various actors namely farmers, Farias, Beparies, wholesaler always concerned about their fair price beside improvement of rice quality.

A progression of significant worth creating exercises related with item promoting from ranch level to a definitive buyer is suggested as worth chain. For the most part the worth chain activities of potato are conveying potato from field in the wake of cutting, cleaning, sacking, putting away, conveying to the business sectors, offering to the dealers (for example Faria, Bepari), offering to the potato then stockpiling believer potato into potato keeping up different quality and evaluating. Cold stockpiling merchants are the beginning on-screen characters in putting away, stowing, shipping to various market, at that point potato dealers carry out the responsibility of offering to a conclusive customer.

1.3 Value Chain Techniques

Robert Fries and Banu Akin (2004) in order to carry out a value chain analysis, the literature used mostly the following techniques:

- ✓ Mapping: Mapping is a central element of value chain analysis, using diagrams to show the progression of transformations and transactions from sourcing raw material and inputs, to production, to further processing, to marketing and final sale. The maps can also illustrate costs, value added at each stage, secondary services (such as finance or communications infrastructure) important to each stage, critical constraints, and the relative clout of players along a value chain. In potato value chain different value adding steps, costs of production, handling costs, marketing channels, value added with potato and potato in each stage etc. will be included into value chain maps.
- ✓ Participatory approach: Because each player along a value chain impacts the value earned, and because players performing different functions and exerting different levels of clout often have very different viewpoints on critical opportunities, bottlenecks and the potential and feasibility of different interventions, value chain analysis demands the participation of the full range of stakeholders. This range includes buyers (i.e.in case of potato value chain Faria, Bepari, wholesaler, cold storage owner, retailer etc.), processors, producers, input suppliers, public agencies and associations that impact industry, trade, labour and commercial regulations and practices. Value chain maps diagram downstream and overseas players, interviews and strategic sessions. It also taps the range of actors along the chain. The perspective, buy in and participation of stakeholders increase the chances that the most critical bottlenecks and opportunities will be not only identified, but successfully overcome.

1.4 Justification of Present Study

Potato has been developed as a basic nourishment crop in Bangladesh. At regular intervals Bangladesh creates a huge measure of potato. An enormously high return and intermittent expense of assembling of the harvest with the presentation of present day advances have maybe given a motivation to the ranchers to blast the area just as generation of potato and consequently increment the attractive overflow of potato in Bangladesh. Anyway because of absence of right publicizing and showcasing focuses ranchers do never again get genuine charge even at some point they can't come up with

the cash for to improve creation expense. The cultivators ought to advance fundamental a piece of their produces immediately in the wake of reaping at an absolutely low cost because of absence of carport offices and cash need of the farmers. Farmers are pressured to spoil potato inside the maximum potato developing regions of Bangladesh. However, it's been observed that during a couple of regions potato rate is very excessive during off season and even in the height season.

If farmers fail to sell their produce at an incentive price they are likely to cease its production, which may adversely affect the economy. Therefore it is very important to make the market efficient for the sake of both farmers and consumers. Value chain analysis of potato marketing can be used for distinguishing the various issues related to marketing problems of potato and may help to identify probable solution.

The present look at intends to discover some of the shortcomings of the prevailing potato marketing system with the goal that continuous increase in its production may be maintained. It is extensively believed that potato growers do no longer get honest charge due to lack of monetary and clinical storage centers, lifestyles of more potent middlemen, inefficient transportation centers, and absence of right advertising records and pressing requirement of cash at once after the harvesting period by the farmers. The seasonal individual of potato arrivals is extraordinarily stimulated through the farmer's failure to reliant them due to its semi perishable nature which results in put up harvest market glut.

There is a robust want for an efficient advertising and marketing device in an effort to accelerate and keep up potato production and thereby promote agricultural boom in the country. Marketing performance to manufacturers whose role is crucial for the advantage of closing clients. The gift examine has been intended to investigate the diverse functions of potato marketing in Thakurgaon district in order to verify the advertising performance by using studying advertising margins of intermediaries, internet proportion of producers, marketing value, advertising performance and the prevailing troubles in potato marketing. On the basis of findings of the have a look at precise suggestions may be made to assist manufacturers, customers, intermediaries (buyers) and coverage makers within the

formulation of practical approaches concerning production and marketing of potato in Bangladesh.

However, this study would first enlarge the volume of value chain research in Bangladesh. Findings of this research for example the efficiency or inefficiency level of value chain and the factors affecting value chain efficiency in different marketing stages will be useful for researchers, policy makers, and development practitioners and most importantly for actors in the potato value chain in Bangladesh. The research would help to formulate recommendation to reduce the marketing cost of potato, institutional constraints to solve problems in the entire potato advertise is so splendidly aggressive because of different government interventions in the market and furthermore possibly presence of some value creators in the potato and potato promoting framework. Potato makers are principally subsistence and semi-subsistence in nature. Most ranchers sell paddy following harvest for quick money needs. Regardless, net revenues change in the rice esteem bind as a result of market defects, inconsistent dealing power among various on-screen characters, and inaccessibility of auspicious market data and so forth. On the off chance that the on-screen characters were known the advantage of investment in the worth chain framework on-screen characters would be benefitted. Since support in improved worth chain ensures the ideal nature of potato and potato, this thus increment both on-screen character's just as extreme buyer's welfare. potato value chain.

Value chain analysis would help understand how to improve the farmer's performance in every value adding steps. Therefore this study will provide an indepth understanding how to increase farmer's share on potato and diminish the share of middlemen. Efficient value chain means efficient potato marketing. The understanding of the efficient market chain would encourage to figure how the country`s food security can be ensured. Thus this study might be of importance to the policymakers, individual farmers, consumers i.e. both macro and micro level.

Moreover, this kind of study has not been conducted in any of the research institutions or government organizations in Bangladesh. Despite the fact that this study was an attempt

for an academic purpose and due to lack of time, man power, and resources, small number of samples uses, this could still provide a shed for understanding the potato value chain in Bangladesh. This study can as proto study to explore further research scope and opportunities for the future research works.

1.5 Objectives of the Study

The main objectives of this study are as follows:

1. To identify the actors involved in value chain
2. To estimate the value addition of potato by the actors in potato market
3. To identify the constraints of potato marketing and suggest measure for the improvement of potato marketing in the selected area

1.6 Limitations of the Study

- i. The first limitation of this study was the shortage of time. The primary data and other necessary information were collected within a brief timeframe and hence could not cover wider area.
- ii. This study became restricted to a limited place, the location where more amount of potato become grown.
- iii. Potato producers did not keep proper records of their farm business. Because of illiteracy and hidden business interest no written records were kept up by the respondents (producers, and traders). Subsequently, the accuracy and the reliability of data mostly depend on their memories. This situation may have caused a built in impediment of the data used in the analysis.
- iv. Potato traders, storage owner and merchants had records of transaction and price in many cases but they were reluctant to disclose their records due to fear of any adverse situation for example imposition of tax. They were reluctant to reveal the actual figures on purchase price, sales price, production, monthly sale, income, profit.

- v. The researcher had to work with small samples because of time constraint. However, the data were analyzed quite exhaustively but a large sample might have strengthened the findings.
- vi. The findings of the study were based on the data of some selected areas of Thakurgaon district in Bangladesh. Therefore, the study may not be representative of the whole Bangladesh.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to review of previous studies, which are related with the present study. There are some studies on value chain of vegetables and fisheries in Bangladesh but studies on potato value chain in Bangladesh are scanty. The review is presented and discussed below. The motive of this chapter is to provide reviews of studies, which might be associated with the present examine.

Akteret *et al.* (2016) led an investigation on An Analysis of Potato Value Chain in Bogra District of Bangladesh. Diverse worth chain entertainers were associated with generation and showcasing framework, for example, Faria, Bepari, distributor, retailer and cold stockpiling proprietor. In Kahaloo upaziala the entire worth chain of potato was finished through five separate stock chains of potato from the hand of ranchers to a definitive customers. Longest store network included rancher, Faria, Bepari, distributor, Distance distributor, Retailer lastly purchaser. Most elevated deals cost of potato was gotten by retailer and the least deals cost was gotten by rancher. Complete worth expansion by various entertainers was discovered 338.12 Tk. per 40 Kg potato. In esteem chain, most elevated worth was included by distributor and least worth was included by Faria of the all out worth expansion. Proportion to moving normal strategy was applied to examinethe value variance of Bogra and Dhaka showcase with the assistance of optional information. The value variance of potato in Bogra and Dhaka advertise was moderately corresponded.

Alam (2004) identified three distinct channels in the supply chain of rice mills in Bangladesh. These are rice processing channel, imported machinery channel and rice mill equipment production channel. In the rice processing channel raw rice from the farmers was bought by the Aratdars or commission agents and supplied to rice millers. Sometime the rice mill owners themselves bought raw rice directly from the farmers through their own intermediaries. The milled rice was then sold to the wholesalers of different districts and cities, sold to consumers through retailers.

Alam (2005) found major value addition of husking mills as rice milling (51.59%), retailing (26.58%) and wholesaling (13.49%) for parboiled rice. The profit margin at husking mill was found about Taka 465.5 (28.65% of value addition at this level). In semi-automatic mills, rice milling (47.62%), retailing (25.39%) and wholesaling (13.49%) constituted the major value addition for parboiled rice. For aromatic rice the major value additions were- rice milling (54.46%), retailing (16.34%) and wholesaling (12.38%). The profit margins were identified as Taka 715.75/ton (47.72% of value addition at this level) and Taka 865.75/ton (62.96% of value addition at this level) for parboiled and aromatic rice, respectively. In case of parboiled rice the profit margins per ton for husking, semi-automatic and automatic rice mills were found Taka 466/ton, 716/ton and 1190/ton, respectively. The variation in profit margins was because of variable processing different types of rice mills. The labour requirement per ton of rice processing at husking mill (Taka 538/ton) was much higher than automatic (Taka 59/ton) and semi-automatic (Taka 338/ton) rice mills. Moreover, high capacity and capacity utilization of automatic rice mills provided an edge over processing cost of rice in husking and semi-automatic rice mills.

Alvero (2008) conducted a study on rice value chain in selected areas of Abuyog, Leyte, Phillipines. The author presented a cost structure and paddy production cost. The author considers the costs for purchasing inputs such as seeds, water supply, pesticides, fertilizers, and transportation costs, and costs for attaining labor for cultivation of land, planting, harvesting, and threshing of paddy. The author also estimated costs in the post-production and marketing of rice from the hands of the assemblers in Abuyog town to wholesaler-millers, retailers, and consumers in Eastern Visayas. The author found that more than half of its total costs are for laborers yet they only receive quarter of the total production's revenue where the rest are shared by the tenant and landlord. Furthermore, farmers play a crucial role in rice production in Abuyog but they are the ones who experience the highest level of social costs among the actors in the rice sub-sector value chain. The author commented that to empower these farmers, the government should initialize or reinforce programs that would benefit them, such as comprehensive agrarian reform, agricultural and cooperative education.

Anna (2006) stated supply chain as the art and science of managing and controlling the flow of goods, energy, information and other resources like products, services and people, from the source of production to the marketplace. It is difficult to accomplish any marketing or manufacturing activity without supply chain network or logistic support. It involves the integration of information, transportation, inventory, warehousing, material handling and packaging. The operating responsibility of logistics is the geographical repositioning of raw materials, work in process, and finish inventories where required at the lowest cost possible.

Azad (2014) conducted a research on value chain analysis of potato in selected areas of Munshiganj district and found that cost and margin analysis of potato, cost of production, variable cost, fixed cost, gross cost, gross return, gross margin, net return, value addition, marketing cost, storage cost, market price calculated. Value addition of retailer is 26.13 percent, wholesaler is 32.16 percent, bepari is 26.13 percent and faria is 15.58 percent. Marketing cost of retailer is 19.56 percent, wholesaler is 45.57, bapari is 30.81 and faria is 4.06 percent. Net marketing margin of retailer is 39.19 percent, wholesaler is 5.49, bapari 16.85 percent and faria is 38.47 percent.

Hajong (2011) found many intermediaries are involved such as Farias, Beparis, Paikars, retailers and cold storage owners in the production and marketing system of potato. The farmers distribute their production for family consumption, gift and kind payment to relatives, seed and maximum portion for sell. Again some potatoes were damaged and loss during storage. Storing of potato in the cold storage plants certainly reduces the excessive losses of potato but all farmers can not avail the facility of cold storages due to several reasons, such as high cold storage charge, uncertainty of future market price, financial insolvency, bad communication and inadequate transport facilities and lack of any provision in getting compensation for damage of potato in the cold storage plants.

Hossain (2004) investigated that the potato marketing in selected areas of Bogra district. This study was mainly based on Sadar Upazila of Bogra district. The sample included 30

farmers and 30 intermediaries. Production cost, yield, marketing cost, marketing margin and net margin of potato farmers and intermediaries were calculated in this study.

Islam (1987) carried out a study on potato preservation in cold storage in Bangladesh including the marketing aspects. He found that price spread per tonnes of potato appropriated by traders was higher in the case cold stored potato than that of non-stored potato.

Kapur (2003) identified value addition of raw rice (Grade-A) milling unit as process cost which includes Rs. 69.6 per quintal (12%) for taxes and levies, cleaning, loading and miscellaneous costs (Vat-4%, Arat-2.5%, market fee-2%, process fee 2%, miscellaneous-1.5%), Rs. 9 per quintal for drying, Rs.20 per quintal for de-husking and polishing, Rs. 2 per quintal for grading. After grading yield of raw rice @ 67% accumulated value becomes Rs. 1015.8. Cost of rice bran (7%) at 500 per quintal. Cost of rice husk (19%) at Rs. 100 per quintal. was Rs.19. Overall gross profit was Rs. 79.2 per quintal. The author also found that percentage of gross profit on sale in respect of rice as 7.5% for raw rice and 6.2% for parboiled rice. In view of the quantum of work load given by purchasing agencies this profit margin appears to be rational. *Grade-A (Basmati rice and superfine quality). (*Here exchange rate of Rupee (and Bangladeshi Taka was 1 Rupee= 1.49 Taka)

Minten *et al.*(2011) found that the lack of availability of high yielding varieties of the highest-quality (fine) rice leads to important costs in the rice value chain, resulting from the conversion of high quality rice. If higher-yielding varieties of fine rice were more readily available, it seems that farmers, if not directly then at least indirectly, should be able to capture a larger share of consumers' increasing willingness to pay for quality, and these varieties would then also become available at lower prices for consumers. The resulting price decreases at the end of the value chain might then also make Bangladesh more competitive in rice export markets.

Mustafa *et al.* (2009) in their study on “Improving Food Security through Value Chain Management: A Study of Rice Value Chain in Bangladesh“ intended to link the concepts of value chain management and food security, a linkage that has received little research attention, particularly in the context of Bangladesh. The broad objective of the research is to analyze whether applying the concepts of value (supply) chain management could improve the competitive advantage of Bangladesh rice industry, and if so, how this could be achieved in practice.

Porter (1985) defined value chain as a chain of activities. Products pass through all activities of the chain in order and at each activity the product gains some value. The value chain categorizes the generic value adding activities of an organization. The “primary activities” include inbound logistics, operation (production), outbound logistics, sales and marketing, and service (maintenance). The “support activities” include administrative infrastructure management, human resource management, research and development, and procurement. The costs and value drivers are identified for each value activity. The value chain framework quickly makes its way to the forefront of management as a powerful analysis tool for strategic planning. Its ultimate goal is to maximize value creation while minimizing cost.

Sabur (1986) conducted a study on marketed surplus of potato in two districts of Bangladesh and found that production and marketed surplus of potatoes moved in same direction and land under potatoes was the most important factor determining the marketed surplus. He showed that the average production cost per hectare was Tk.29637.57 which was the lowest medium farmers and net returns and benefit cost ratio were calculated at Tk.30947.82 per hectare and 1: 2.25 respectively which were the highest for medium farmers in both the areas. Regional Agricultural Research station, Jamalpur under the Farm Research Division of BARI, Joydebpur conducted a research on "Improvement of existing fanning system through holistic approach". They summarized the findings in a report (1992-93). They found that the yield per hectare of HYV potato was 9.25 tones and cost per hectare was Tk. 17,000.00. They observed that the net return depended largely on the harvest price of potato.

Saiyem (2007) investigated the potato marketing system and price behavior in selected areas of Rangpur district. The samples include 60 sample farmers and intermediaries. In this study production cost, yield, marketing cost, marketing margin, net margin and price behavior of potato farmers and intermediaries were estimated.

Saklayen (1999) investigated that the potato marketing in selected areas of Munshiganj district. This study was mainly based on Sadar Upazila and Tongibari Upazila of Munshiganj district. The sample included 30 farmers and 30 market intermediaries of Munshiganj Sadar Upazila and Tongibari Upazila. He found that the marketing cost per quintal of potato incurred was Tk. 43.46 and Tk. 44.36 for farmers of Munshiganj Sadar Upazila and Tongibari Upazila respectively. The marketing costs incurred per quintal potato were Tk. 60.95, Tk. 56.87, Tk. 133.60 and Tk. 37.81 for Beparis, Paikers, cold storage owners and retailer of Munshiganj bazar respectively. The marketing costs incurred per quintal were Tk. 45.42, Tk. 61.21, Tk. 134.64 and Tk. 37.32 for Beparis, Paikers, Cold storage owners and retailers of Tangibari bazar respectively. The net margins of per quintal potato of Beparis, paikers, the cold storage owners and retailers of Munshiganj bazaar were calculated at Tk. 21.73, Tk. 21.50, Tk. 19.57 and Tk. 23.28 respectively. The net margin of per quintal potato of Beparis, Paikers, the cold storage owners and retailers of Tongibari bazar were calculated at Tk. 30.02, Tk. 26.91, Tk. 25.62 and Tk. 21.94 respectively.

Sarkar (1990) conducted a research on potato marketing in Bangladesh. His study expounded that only few growers store their potato in cold storage plants due to high storage charge. His study revealed that communication system should be developed to transport potato from production area to the terminal market to strengthen the economic condition of the potato growers. Storage facilities should be improved at the primary and secondary markets by establishing public as well as private cold storage plants at different points of potato marketing channel. His study emphasised on the improvement of ordinary storage in scientific manner as well as innovation of low-cost storage technique which would not only ensure timely availability of quality seed but also better

price at reduced storage costs throughout the year by enlarging storage period at farm level.

Stryker (2008) concluded that major advances were made in rice competitiveness through liberalization of rice marketing and milling. This led to the introduction of small rice hullers, which were able to process rice relatively inexpensively compared with larger mills. There were also substantial savings in the cost of transporting paddy and the value for animal feed of the hulling byproducts. However, with rice prices having risen on world markets and with advances in milling technology, it is time to revisit this question. The imported rice with which domestic production competes is of a quality standard not met by most small hullers, resulting in price discounts and lost profits. Evidence from Rwanda and a few other countries suggests that milling technology currently exists that allows for upgrading of quality without necessarily losing the advantages of operating on a relatively small scale. Better milling should take care of the problems of impurities, lack of uniformity, and high percentage of broken grains. Complementary investment in storage should also ensure that adequate supplies of local rice are available year round. This will not necessarily solve problems of taste, storability, cooking time, water absorption and other characteristics that are not apparent to the eye.

Research Gap

Value chain of potato is very important in the context of Bangladesh. Till now sufficient research study had not been conducted in this important area. Very extensive and in-depth research works are urgently needed for providing information for the policy makers so that better policies can be formulated. The aforesaid reviews reveal that studies were undertaken exclusively on the marketing aspect of potato. A few studies on value chain of potato marketing have been undertaken in Bangladesh. The existing research has been undertaken to make an in depth study to provide knowledge in the field of potato marketing.

CHAPTER III

METHODOLOGY

The technique utilized in carrying out any studies plays a fundamentally crucial position and deserves cautious consideration through the researcher while formulating methods and technique. It enables the researcher to accumulate valid and dependable facts in phrases of speculation or research tool and to explore the facts well to reach at correct and valid outcomes. The tools and methods used and followed for the study with considering the specific objectives of the study are given below.

3.1 Study area

Pirganj upazilla of Thakurgaon District was selected purposively for the study. The justification behind selection of Pirganj upazila that it is one of the leading potato producing area of Thakurgaon district.

3.2 Sampling Technique

Data were collected during the period from February to August, 2019 through face to face interview. Four retail markets Futani town bazar, Gonirhat bazar, Pirganj bazar and Gogor Bazar were selected from Pirganj upazila of Thakurgaon district by applying purposive sampling technique. The sample size was 30 and data were collected from each of the upazila through simple random sampling technique by using random number table. Sixty other value chain actors (15 Farias, 15 Beparis, 15 wholesalers and 15 retailers) and two cold storage owners were selected from the study area by using purposive sampling.

3.3 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, traders and cold storage owner. At first, 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 persuaded to cooperate with the researcher. At the time of interview, the researcher asked questions

systematically and clarified the question whenever it was felt necessary. Farmers were requested to provide correct information as far as possible. Many did not keep any records of their businesses and activities. This problem was confronted by memory. Data were also collected from potato traders like Faria, Bepari, wholesaler and retailer.

3.4 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 collected initially in local units. After checking them these were converted into quantitative form by using suitable scoring. Inconsistencies in the data were removed. Analysis was done using the concerned software Microsoft Excel version.

3.5 Analytical Technique

In this study cost benefit analysis was used to analyze profitability of potato, additionally researcher also used Tabular analysis to analyze value chain of potato.

3.5.1 Gross return and net return of the farmer

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

$$GR = \sum Q_m \cdot P_m$$

Where,

GR= Gross return from product

Q_m = Quantity of product

P_m =Avg. price of product

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

$$\Pi = \text{Gross return} - (\text{Variable cost} + \text{fixed cost})$$

Here, Π = Profit per cycle

$$\text{Gross return} = \text{Total production} * \text{per unit price of potato}$$

Variable cost: Production cost of potato

Fixed Cost:

- Land use cost
- Interest on operating capital Marketing cost of potato

Marketing Cost of Potato:

- License fee
- Loading and unloading
- Power and electricity charge
- Telephone charge
- Market toll
- Transportation
- Grading
- Storage cost
- Personal expenses
- Unofficial payment

3.5.2 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

$$\text{Value Addition (\%)} = \frac{(\text{Sales Price} - \text{Purchase Price})}{\text{Purchase Price}} \times 100$$

- Interest on operating capital = Amount of operating capital x Interest rate (%) x Time required (in years) /2
- Variable cost of potato production was considered as operating capital.

CHAPTER IV

RESULTS AND DISCUSSIONS

4.1 Introduction

In potato showcase endeavors have been made to perceive the on-screen characters in the potato esteem chain to create esteem affix map and to look at the worth expansion by potato makers, esteem chain on-screen characters of potato and cold stockpiling proprietors. Worth expansion is essentially translated as the contrast between absolute costs engaged with making or purchasing of a product and the complete income accumulating from its arrangements.

Worth expansion exercises are mostly worried about the progressions of utilities. At the point when item goes through dissemination channels, it makes spot, time and possession utilities. Hence this section manages recognizing the entertainers engaged with esteem chain and their elements of potato advertising.

4.2 Actors Involved in Potato 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 out a vital role in achieving the marketing objectives of any organization. Considering that potato is a vital vegetable in Bangladesh, the product moved from the dealers to purchasers via the indistinguishable chains i.e. through some market actors like Faria, Bepari, wholesaler, retailer and cold storage owner. The observe discovered that there had a motion of potato from the point of production to the factor of clients through certain entertainers shaping a chain within the potato market within the take a look at location.

From Figure 4.1, it is found that the potato in Thakurgaon district is moved through the following chains (Azad, 2014):

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 evaluation famous that marketing of potato in Thakurgaon district is moved from the hands of producers to the fingers of purchasers via 5 separate chains. Chain III is the longest value chain. In this chain the essential marketing actors have been the farmer, Faria, Bepari, wholesaler, distance wholesaler and store who introduced value within the advertising and marketing channels. They took a portion of margins at every degree of value addition sports.

It is clear that at the side of the farmers, some of actors participated inside the advertising of potato from the production factor to the purchaser factor. The predominant actors involved inside the potato 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 potato value chain inside the studies encompass farmers, investors which include Faria, Bepari, wholesaler and store. They are in commonplace end up proprietors of the product at positive stage within the value chain of potato advertising. The service vendors are being subcontracted by means of the value chain actors. One of the important providers in the have a look at area became the cold storage owners.

4.2.1 Producer-seller

The producer-seller had been the farmers who after harvesting the produce executed the position of a supplier in advertising potato. Potato producers had been the principle actor

and played a critical position inside the potato fee chain. They produced potato independently and sold them to the neighborhood investors or urban buyers.

In the study region the producers used to sell potato to the market actors consisting of Faria, Bepari, cold storage proprietor, and retailer either on the markets or on the farmyard.

4.2.2 Faria

They were small investors and that they handed particularly small volume of potato than that completed by using various traders. They had been independently organized. They had no permanent body of workers and permanent save within the market and did their petty business venture in cash. More than half of the Faria became engaged in potato trading for more than five years. The Faria bought potato from the farmers in the nearby market and offered it direct to Bepari and wholesalers inside the equivalent market.

4.2.3 Bepari

The Beparis had been additionally non-authorized investors. The Beparis have been noticeably medium buyers and that they dealt with fairly large quantity of potato than that accomplished through different buyers. They have been independently prepared. They had no fixed commercial enterprise premises. Most of the Bepari had no permanent shop and group of workers. Cage sale or purchase turned into very commonplace practice for Bepari.

There is powerful competition some of the Bepari at access to this form of enterprise is not instead clean. As a result, Bepari couldn't make high profit in their commercial enterprise. The Beparis have been expert traders who purchased potato from the farmers, Farias on the local market and offered it to district wholesalers and nearby wholesalers. They themselves financed their business and typical contract in rare case.

4.2.4 Wholesaler

The wholesalers have been certified traders. The wholesalers had been exceptionally massive traders and that they dealt with incredibly larger quantity of potato than that

completed via the alternative buyers. They had fixed business premises. Most of the wholesalers have been independently organized and self-financed.

They employed both labors and other group of workers on daily wage basis for performing diverse features. They had no permanent staffs. The wholesalers purchased potato from the producer, Bepari, Faria and sold it to the space market (Dhaka, Rajsahi, Rangpur city and many others). The wholesalers now and again used to borrow cash from unique bank, NGO, other monetary institute and different non- institution (like friends and spouse and children and other investors) for a short period in uncommon instances. Among different matters, space in the market turned into the significant barrier to go into the wholesale market. In both the markets, there may be an association of the wholesalers. Association acted as obstacles to new entrants. They likewise concerned in grading, sorting, washing and packaging of potato.

4.2.5 Retailer

The stores were the remaining hyperlink in the advertising and marketing of potato. They had been the specialized dealers who were immediately related with the purchasers. Retailers were the small sorts of all traders. Sometimes, they bought potato from the wholesalers at the district stage. They sold the potato in small volume on the idea of open bargaining and offered it at once to the ultimate purchasers at their retail stores. The outlets were the expert buyers who used to elevate their purchased potato to customers without delay. Most of the stores were independently organized having everlasting shops usually inside the open market place and exertions for performing retailing activities. There were a few outlets who had no everlasting save generally use open market place for his or her sale. Most of the outlets (each Thakurgaon) have been doing business for extra than five years. In spite of being self-financed they borrowed cash from pals, household and other non-institutional resources at the time of need.

4.2.6 Cold storage owner

The cold storage of perishable commodities for periods longer than eight is practiced for the following reasons (GOEP, 1969):

- To extend the period of marketing;
- To ensure even supplies of raw materials used in processing plants;
- To reduce the wide fluctuation between the prices in the peak harvesting period and in the lean supply period or off-season;
- To enable the farmers to get better return from their produce;
- To allow fruits and vegetables to be placed on distant markets and
- To sustain the good quality of seed for better production.

The cause of storing potato in cold storage is to maintain tubers edible situation and to provide uniform supply of potato to the marketplace during off season. Cold storage facilitates in orderly advertising and marketing of perishable gadgets through casting off or reducing storage loss and lengthening advertising durations narrowing seasonal fluctuation in deliver and fees. Cold storage performs a very critical function in increasing manufacturing of potato via imparting nice seed potato in time (GOEP, 1969).

The cold storage proprietors possessed bloodless storage flora for potato storage and rendered storage facilities to the potato traders and farmers on receipts of storage charges. They keep potato greater than 7 to eight months within the year. They additionally sold potato from farmer and Bepari, stored the same of their plant life and offered to the distributing Bepari and wholesaler.

CHAPTER V

VALUE ADDITION OF POTATO

5.1 Introduction

One of the targets of the present investigate is to assess cost presented via the actors of fee chain, specifically the potato growers and numerous buyers. Value addition activities are particularly worried with the adjustments of utilities. In economics, value added is the difference among the sale fee of a product and the fee of materials to produce it. In national money owed utilized in macroeconomics, it refers to the contribution of the factors of producing, i.e., land, exertions, and capital goods, to elevating the fee of a product and corresponds to the earning obtained by the owners of those factors. The country wide fee added is shared among capital and exertions (as the elements of producing), and this sharing gives upward push to troubles of distribution. Value delivered refers to the additional value of a commodity over the cost of commodities used to provide it from the previous level of producing. The price delivered to any product or service is the result of a specific method.

A broad definition of value addition is to economically add value to a product and characteristics greater favored inside the marketplace region. There are two foremost styles of price addition, innovation and coordination. Innovation makes a specialty of improving present strategies, techniques, merchandise or carrier. The enhancement brought to a products or services by a corporation before the product is offered to customers.

Hence this bankruptcy is concerned with the estimation and analysis of fees, returns and value addition of potato manufacturing. Here the cost addition of potato cultivation turned into computed Tk/100 kg. In potato cultivation value of inputs like human hard work, land coaching fee, seed price; fertilizer and manure price, insecticide cost, irrigation fee and some fixed price like land hire and interest on operating capital have been required. Marketing price is also predicted at distinct levels of cost chain.

5.2 Cost and Margin Analysis of Potato

The cost incurred in providing the commodity and markets received by various traders are discussed below.

5.2.1 Cost of production

Costing is a critical part of walking a commercial enterprise efficiently. This segment targets at identifying and quantifying one-of-a-kind expenses that are incurred through the farmers in manufacturing method. The cost concerned in potato cultivation can be subdivided in two ways: variable price and fixed cost.

5.2.2 Variable cost

The variable prices are the expenses of the use of the variable inputs. These costs vary with the level of production. Higher the production more could be the variable fees, decrease the manufacturing, decrease can be the variable costs.

5.2.3 Fixed cost

Fixed property encompass the items, which are permanent in nature and remaining longer than the duration of the crop. Fixed belongings are the ones, which do not alternate and are incurred even when production is not undertaken. Fixed fee of potato cultivation includes rent of land and interest on working capital.

5.2.4 Gross cost

In order to estimate gross cost per kg and per 100 kg all the resource uses in potato cultivation have been recaptured together.

5.2.5 Gross return

Gross return was calculated by multiplying the total amounts of products by average sales price.

5.2.6 Gross margin

Gross margin is the gross return over variable cost. Gross margin is obtained by deducting total variable cost from gross return.

5.2.7 Net return

Net return is very useful tool to analyze or compute performance of enterprises. It is calculated by subtracting gross cost from gross return.

5.2.8 Value addition

When any product creates utility then it adds value. The difference in the price at the farm level (price received by the farmer) and that at the retail level (price paid by the consumer) may be used to measure the value added (Acharya and Agarwal, 2004, p.388)

5.2.9 Marketing cost

The marketing cost represents the fee of acting the numerous advertising functions. It additionally stated about operations with the aid of numerous companies concerned in the advertising and marketing system. In other words the cost, which incurred to move the product from manufacturers to customers are commonly known as advertising value. Marketing price of potato on the actors, at intermediaries' degree includes the prices incurred by way of unique actors for motion of the product thru the cost chain. Major items of advertising fee of actors of all the kinds were transportation, storage, wastage, grading, market toll, loading and unloading, commission, license, personal expenses, unofficial payment and others price (i.e., power price, stationary item like papers, pad, weighing charge, leisure and tips etc.).

5.2.10 Storage cost

Storage is an important feature of marketing. It creates time software. The garage characteristic is generally involved with making items to be had on the desired time. Proper garage centers are important to be able to minimize quantitative and qualitative losses of agricultural commodities. All the cold garage owners of the look at areas stored

potato in their personal bloodless storage from April to November (8 months) under managed temperature of zero-2 diploma Celsius.

5.2.11 Market price

Pricing is an important feature in shopping for and selling of any commodity. Fixing potato fee via open bargaining was usually practiced in the look at regions. The price become fixed by using eye estimation of the product. Price of potato relies upon on its coloration, size and range. Both call for and supply affected the fee, which indicated that potato market turned into greater or less aggressive. It changed into determined that the high-quality best potato sold at better prices.

5.3 Cost and Return Analysis of Potato Farmer

Table 5.1 Average production cost and return of potato for 100 Kg

	Cost Items	Cost(TK. /100 Kg)
Variable cost	Human and labor cost	88.68
	Land Preparation	35.67
	Seed	40.34
	Fertilizer	23.60
	Insecticides	18.78
	Irrigation	24.67
	Total	231.74
Fixed costs	Rental value of Land	395.75
	Interest on operating capital	4.70
	Total	400.45
Total production cost (TK./100Kg)		632.19
Marketing cost	Grading, washing and sorting	55.75
	Transportation cost	32.35
	Loading and unloading	15.50
	Market toll	14.50
	Personal expense	18.50
	Unofficial payment	15.50
	Total	152.1
Total cost		784.29
Cold storage charge		380.75

(Field survey, 2019)

Summation of the costs of variable inputs made general variable costs, which changed into Tk. 231. Seventy four in step with a hundred kg of potato. Summation of the charges of constant inputs made total constant fees, which changed into Tk. 400.45/100 kg. Interest on working capital was Tk.4.70 consistent with 100 Kg of potato. Total

manufacturing cost of potato was Tk. 632.19 consistent with 100 kg. The advertising value of farmers protected the fee of grading, washing and sorting, transportation, loading and unloading, market toll, non-public rate, and unofficial payment. It changed into envisioned in keeping with 100 kg of potato Tk. 152.1. If the marketing price is covered than overall fee will become Tk. 784.29. It became showed that bloodless storage charge according to one hundred kg of potato turned into Tk. 380. Seventy five farmers keep their potato as seed (Table 5.1).

Gross return was calculated by multiplying the total amounts of products by average sales price. It was seen that gross return per 100kg of potato was Tk.1352 and Tk. 13.52 per kg respectively. Variable cost per 100kg of potato was Tk. 231.74 and Tk. 2.31 per kg respectively. Total cost per 100 kg of potato cultivation (with marketing) was Tk. 784.29 and Tk. 7.84 per kg respectively. Gross margin was obtained by deducting total variable cost from gross return. Gross margin per 100 kg of potato was Tk. 1120.26 and Tk.11.20 per kg respectively. Net return was estimated by subtracting total cost from gross return. Net return per 100 kg of potato was Tk. 567.71, Tk.5.68 per kg respectively (Table 5.2).

Table 5.2 Profitability of potato farmer

Particulars	Tk. Per 100 Kg	Tk. Per Kg
Gross return	1352	13.52
Variable cost	231.74	2.31
Total cost	784.29	7.84
Gross margin (i-ii)	1120.26	11.20
Net return (i-iii)	567.71	5.68

(Field survey, 2019)

Farm gate price is that price which farmer gets through selling their produce at the farm yard. The average farm gate price of potato was Tk. 1056.56 per 100 kg. Average market price per 100 kg of potato was Tk.1326. The estimated average marketing cost per 100 kg of potato incurred by the farmers was Tk. 152.1. Value addition per 100 kg of potato was Tk. 295.44 and Tk.2.95 per kg respectively. Among the value addition farmers covered the 26.45 per cent of total value addition (Table 5.3).

Table 5.3 Value addition of potato by farmer

Average Farm gate price per Kg	Market price per Kg	Average marketing cost per 100 kg	Value addition Tk. per 100 Kg	Value addition Tk. Per Kg	Value addition (%)
1056.56	1352	152.1	295.44	2.95	26.45

(Field survey, 2019)

5.4 Cost and Margin Analysis of Faria

The amount of average transaction per day of potato by Faria was 875 kg. Average total return of potato was Tk.11856.25per day. The average purchase price per 100kg of potato was Tk.1056.00 and sales price was Tk. 1355.00 and per Kg of potato was Tk. 10.56 and Tk. 13.55 respectively. Value addition per 100kg of potato was Tk. 299.00 (marketing margin) and value addition per kg of potato was Tk. 2.99 (Table 5.4).

Table 5.4 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)	875	-	-	-
Average Purchase Price	-	10.56	1056.00	-
Average Sales Price	-	13.55	1355.00	11856.25
Value Addition	-	2.99	299.00	-

(Field Survey, 2019)

Faria mainly sold potato to the Bepari or wholesaler. After collecting potato from the growers from the market they sold it directly to the end Bepari or wholesaler. The estimated average marketing cost per kg of potato incurred by the Fariawas Tk.0.25. Among the cost items market toll covered the highest cost representing 64.00 percent of total cost. The second highest cost item was personal expanses which was 20.00 per cent of total cost. Among other cost items, telephone bill and others was 12.00 per cent and 4.00 per cent respectively (Table 5.5).

Table 5.5 Marketing cost incurred by Faria

Particulars	Average cost (Tk./kg)	Per cent of total cost
Personal expenses	0.05	20
Telephone charge	0.03	12
Market toll	0.16	64.
Others	0.01	4
Total	0.25	100

(Field Survey, 2019)

The average purchase price per 40 kg of potato was Tk. 1056.00 and sales price was Tk. 1326.00 and it was Tk. 10.56 and Tk. 13.26 per kg, respectively. The amount of value addition per 100kg of potato was Tk.299.00 (marketing margin) and value addition per kg of potato was Tk. 2.99. Among the value addition Faria covered the 25.57per cent of total value addition. The average marketing cost per 100 kg of potato was Tk. 25.00. Here Faria was not involved in storage activities (Table 5.6).

Table 5.6 Value addition and marketing margin of potato incurred by Faria

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
Purchase Price	1056.00	10.56	
Sales Price	1326	13.26	
Value Addition (ii-i)	299.00	2.99	25.57
Marketing Cost	25.00	.25	
Net Marketing Margin (iii-iv)	274	2.74	

(Field Survey, 2019)

5.7 Cost and Margin Analysis of Bepari

The amount of average transaction per day of potato by Bepari was 2250 kg. Average total return of potato was Tk. 30937.5per day. The average purchase price per 100 kg of potato was Tk. 1158.00 and per Kg was Tk. 11.58 and sales price per 100kg of potato was Tk.1375.00 and per Kg was Tk. 13.75. The amount of value addition per 100kg of potato was Tk.217.00 (marketing margin) and value addition per kg of potato was Tk. 2.17 (Table 5.7).

Table 5.7 Daily transactions and value addition incurred by Bepari

Particulars	Amount (Kg)	Tk. Per Kg	Tk. per 100 Kg	Total Return (Tk.)
Average Transaction (Per Day)	2250	-	-	-
Average Purchase Price	-	11.58	1158.00	-
Average Sales Price	-	13.75	1375.00	30937.5
Value Addition	-	2.17	217	-

(Field Survey, 2019)

Bepari mainly sold potato to the local market wholesalers and district wholesale market. After collecting potato from the growers and Faria they sold it directly to the end wholesaler. The estimated average marketing cost per kg of potato incurred by the Bepari was Tk.1.63. Among the cost items transportation covered the highest cost representing 47.85 percent of total cost. The second highest cost item was storing of potato which was 28.84 per cent of total cost. Among other cost items, market toll, loading and unloading, rent of store, telephone charge, unofficial payment, and personal expenses were 9.82 per cent, 10.43, 0.00per cent, 1.23 per cent, 0.00 per cent, and 1.83 per cent respectively (Table 5.8).

Table 5.8 Marketing cost incurred by Bepari

Cost items	Average cost (Tk./kg)	Per cent of total cost
Market toll	0.16	9.82
loading and unloading	0.17	10.43
Transportation	0.78	47.85
Rent of store	0.00	00
Storage cost	0.47	28.84
Telephone charge	0.02	1.23
Unofficial payment	0.00	00
Personal expenses	0.03	1.83
Total	1.63	100

(Field Survey, 2019)

The average purchase price per 100kg of potato was Tk. 1158.00 and sales price was Tk.1375.00 the amount of value addition per 100kg of potato was Tk. 217.00 (marketing margin) and value addition per kg of potato was Tk. 2.17. Among the value addition Bepari covered the 18.74per cent of total value addition. The average market cost per 100 kg of potato was Tk. 163.00. Here Bepari was involved in storage activities. The storage cost per 100kg of potato was Tk. 54.00 per month (Table 5.9).

Table 5.9 Value addition and marketing margin of potato incurred by Bepari

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
Purchase Price	1158	11.58	-
Sales Price	1375	13.75	-
Value Addition (ii-i)	217	2.17	18.74
Marketing Cost	163	1.63	-
Net Marketing Margin (iii-iv)	54	0.54	-
Storing Cost (Per Month)	57.78	0.57	-

(Field Survey, 2019)

5.6 Cost and Margin Analysis of Wholesaler

The amount of average transaction per day of potato by wholesaler was 6550 kg. Average total return of potato was Tk. 116917.5 per day. The average purchase price per 100kg of potato was Tk. 1468.00 and per Kg was Tk. 14.68 and sales price per 100kg of potato was Tk. 1785.00 and per Kg was Tk. 17.85. The amount of value addition per 100kg of potato was Tk. 317.00 (marketing margin) and value addition per kg of potato was Tk. 3.17 (Table 5.10).

Table 5.10 Daily transactions and value addition incurred by Wholesaler

Particulars	Amount (Kg)	Tk. Per Kg	Tk. per 100 Kg	Total Return (Tk.)
Average Transaction (Per Day)	6550	-	-	-
Average Purchase Price	-	14.68	1468.00	-

Average Sales Price	-	17.85	1785	116917.5
Value Addition	-	3.17	-	-

(Field Survey, 2019)

Wholesaler mainly sold potato to the distance wholesaler. After collecting potato 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 potato incurred by the wholesaler was Tk.2.473. Among the cost items transportation cost covered the highest cost representing 27.45 percent of total cost. The second highest cost item was storage cost which was 23.10 percent of total cost. Among other cost items license, loading and unloading, market toll, grading, telephone charge, personal expenses, unofficial payment and others were 0.12, 10.11, 4.45, 18.60, 6.87, 4.85, 1.62 and 2.83 percent respectively (Table 5.11).

Table 5.11 Marketing cost incurred by Wholesaler

Cost items	Average cost (Tk./kg)	Per cent of total cost
License	0.003	0.12
loading and unloading	0.25	10.11
Transportation	0.67	27.10
Storage cost	0.58	23.45
Market toll	0.11	4.45
Grading	0.46	18.60
Telephone charge	0.17	6.87
Personal expenses	0.12	4.85
Unofficial payment	0.04	1.62
Others	0.07	2.83
Total	2.473	100

(Field Survey, 2019)

The average purchase price per 100kg of potato was Tk.1587.00 and sales price was Tk.1849.00. The amount of value addition per 100kg of potato was Tk.262.00 (marketing margin) and value addition per kg of potato was Tk.2.62. Among the value addition wholesaler covered the 21.59 per cent of total value addition. The average market cost per 100 kg of potato was Tk.247.00. Here wholesaler was involved in storage activities. The storage cost per 100kg of potato was Tk. 61.70 per month (Table 5.12).

Table 5.12 Value addition and marketing margin of potato incurred by wholesaler

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
Purchase Price	1468	14.68	-
Sales Price	1785	17.85	-
Value Addition (ii-i)	317	3.17	21.59
Marketing Cost	247	2.47	-
Net Marketing Margin (iii-iv)	70	.70	-
Storing Cost (Per Month)	64.18	0.64	-

(Field Survey, 2019)

5.7 Cost and Margin Analysis of Retailer

The amount of average transaction per day of potato by retailers was 84.75 kg. Average total return of potato was Tk.3815.00 per day. The average purchase price per 100kg of potato was Tk.1789.00 and per kg of potato was Tk.17.89 and sales price per 100kg of potato was Tk.2026.00 and per kg of potato was Tk.20.26. The amount of value addition per 100kg of potato was Tk.237.00 (marketing margin) and value addition per kg of potato was Tk. 2.37 (Table 5.13).

Table 5.13 Daily transactions and value addition incurred by Retailer

Particulars	Amount (Kg)	Tk. Per Kg	Tk. per 100 Kg	Total Return (Tk.)
Average Transaction (Per Day)	84.75	-	-	-
Average Purchase Price	-	17.89	1789	-
Average Sales Price	-	20.26	2026	3815.00
Value Addition	-	2.27	237	-

(Field Survey, 2019)

Retailers mainly sold potato to the ultimate consumers. After collecting potato from the district wholesale market and they sold it directly to the end users. The estimated average marketing cost per kg of potato incurred by the retailers was Tk. 1.10. Among the cost items electricity charge cost covered the highest cost representing 21.82 percent of total cost. The second highest cost item was license which accounted for 19.10 percent of total cost. Among other cost items loading and unloading, telephone charge, market toll,

personal expenses and unofficial payment were 14.54, 10.00, 15.45, 1.81 and 6.37 percent respectively (Table 5.14).

Table 5.14 Marketing cost incurred by Retailer

Cost items	Average cost (Tk./kg)	Per cent of total cost
License	0.21	19.10
loading and unloading	0.16	14.54
Electricity charge	0.24	21.82
Telephone charge	0.11	10
Market toll	0.12	10.91
Personal expenses	0.17	15.45
Unofficial payment	0.02	1.81
Others	0.07	6.37
Total	1.10	100

(Field Survey, 2019)

The average purchase price per 100kg of potato was Tk.1758 and sales price was Tk.2026.00. The amount of value addition per 100kg of potato was Tk.237.00 (marketing margin) and value addition per kg of potato was Tk.2.37. Among the value addition retailer covered the 14.59percent of total value addition. The average market cost per 1000kg of potato was Tk.110.00. Here retailers were not involved in storage activities (Table 5.15).

Table 5.15: Value addition of the Retailer

Particulars	Tk. Per 100 Kg	Tk. Per Kg	Value addition (%)
Purchase Price	1768	17.89	
Sales Price	2026	20.26	
Value Addition (ii-i)	237.00	2.37	14.59
Marketing Cost	110.00	1.10	
Net Marketing Margin (iii-iv)	127	1.27	

(Field Survey, 2019)

5.8 Cost and Margin Analysis of cold storage owner

The total cost of cold storage owner was Tk.447655 per month and large cost item is power and electricity charge Tk.316666.67 per month and lowest cost item is cold storage rent. Among other cost items salary and wage, repair and maintenance, license

fee and others cost were Tk. 120000, Tk. 7222.22, Tk. 694.44 and Tk. 2916.67 respectively. The cold storage charge was Tk.175 per month (Table 5.16).

Table 5.16 Cost and margin of cold storage owner

Cost item (Per month)	Tk.
Salary and wage	120000.00
Power and electricity	316666.67
Repair and maintenance	7222.22
License fee	694.44
Cold storage rent	155.00
Others	2916.67
Cold storage charge (100 Kg)	437.50

(Field survey, 2019)

The average capacity (100Kg) of cold store was 8266680.00, starting month of the storage is 1st March and release month is November. Price of the potato during the production period was Tk. 812.50(100kg), price during the harvesting period was Tk.875.00 (100kg) and price during the storage was Tk. 950 (100Kg) (Table 5.17).

Table 5.17 Information on cold storage

Average capacity (Kg)	Month of storage	Month of release	Price before harvesting (Tk. / 100 Kg)	Price during harvesting (Tk. / 100 Kg)	Price during storage (Tk. / 100 Kg)
8266680	1st March	November	950	1025	1200

(Field Survey, 2019)

The average storage amount of table potato of farmer was 1453320 Kg and seed potato was 3194520 Kg, average storage amount of table potato of Bepari and wholesaler was 2680000 Kg and 938840 Kg respectively. Both the actors start their storage in the month of March and release in the month of November. The average cold storage charge was Tk. 437.50 (100Kg) for both value chain actors (Table 5.18).

Table 5.18 Information on storage of different value chain actors

Actors	Table potato (Kg)	Seed potato (Kg)	Duration of the storage		Cost of storage (Tk. / 100Kg)
			Table potato	Seed potato	
Farmer	1453320	3194520	March to November	March to November	437.50
Bepari	2680000	-	March to September	-	437.50
Wholesaler	938840	-	March to June	-	437.50

(Field survey, 2019)

Table: 5.19 Value addition, marketing cost and net marketing margin of different market actors of potato

Actors	Value addition (Tk. per Kg)	Marketing cost (Tk. per Kg)	Net marketing margin (Tk. per Kg)
Faria	2.99	.25	2.74
Bepari	2.17	1.63	.54
Wholesaler	3.17	2.47	.70
Retailer	2.37	1.10	1.27

(Field survey, 2019)

Table: 5.20 Value addition by different value chain actors

Actors	Value addition (Tk. per Kg)	Marketing cost (Tk. per Kg)	Net marketing margin (Tk. per Kg)
Faria	27.94	4.59	52.19
Bepari	20.28	29.91	10.29
Wholesaler	29.63	45.32	13.33
Retailer	22.15	20.18	24.19

(Field survey, 2019)

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

CHAPTER VI

PROBLEMS FACED BY POTATO VALUE CHAIN ACTORS

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

6.1 Problems Faced by Producers

The potato producers within the examine areas have been going through various troubles which might be widely labeled into production issues and advertising problems. Some of the producing issues have been inadequate capital, diseases and pest attacks, scarcity of excellent exceptional seed, loss of availability of good enough inputs and excessive price of inputs. Marketing problems were associated with transportation price, lower charge of potato, scarcity of marketing centers, excessive bloodless storage price and dominance of price chain actors and so on.

6.2 Production Problems

6.2.1 Inadequate capital

In the study areas potato farmers suggested that production of potato wishes right software of fertilizers, water and other inputs, in addition to important care with admire to well timed agronomic practices. The production fee of potato changed into excessive on the grounds that enter necessities had been high. It became tough to control required capital on the part of the producers. Table 6.1 suggests that approximately 80 percent of the farmers (out of 30 farmers) have been confronted inadequate of capital as a production hassle.

6.2.2 Diseases and pest attack

In the observe areas ailment and pest assault was a major trouble which producers faced in potato cultivation. They additionally mentioned that they had been now not well educated about pest and diseases manipulate measure on their potato cultivation. From

Table 6.1 it turned into determined that about 75 percent of the farmers (out of 30 farmers) were adversely affected in their potato cultivation.

6.2.3 Shortage of good quality seed

In the observe regions majority of the manufacturers said that shortage of appropriate quality seed become one of the most important problems. They could not get the desired first-rate of exact seed, as its supply become insufficient to fulfill the demand of the customers. For this purpose, the producers used personal preserved seeds and occasionally local variety of seeds. As a end result, they received low yield of potato. Table 6.1 indicates that approximately 92 percent of the farmers (out of 30 farmers) complained that correct best seed become now not available within the marketplace at some point of potato planting time.

6.2.4 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 potato cultivation. Table 6.1 indicates that about 97 percent of the producers (out of 30 farmers) faced this problem.

6.2.5 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 potato cultivation. Table 6.1 indicates that about 96 percent of the producers faced this problem.

Table 6.1 Problem faced by farmers in production and marketing of potato.

Problem faced by producers	Percent
Production problem	
Inadequate capital	80
Diseases and Pest attack	70
Storage of good quality seed	90
Lack of availability of adequate inputs	97
Higher cost of input	96
Marketing problems	
High transportation cost	75
Low price of potato	99
Shortage of marketing facilities	71

High cold storage charge	57
Dominance of value chain actors	54

(Field survey, 2019)

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 became very high in the study vicinity. The primary and secondary markets had been now not immediately linked with the villages. Due to excessive transportation fee and terrible communication centers, the farmers were bound to sell potato in neighborhood markets at low charges. About 75 percent of producers said that excessive transportation value and insufficient verbal exchange facility were hassle in transporting their produce to the markets (Table 6.1).

6.3.2 Low market price of potato

All the pattern farmers mentioned that low price turned into a prime hassle in potato advertising and marketing. Due to loss of remunerative price of potato, the farmers of the selected areas did no longer get honest returns from potato cultivation. Table 6.1 shows approximately 99%of the farmers (out of 30 farmers) faced this problem.

6.3.3 Lack of market facilities

In the examine regions, there was no shed to protect the producers and their potato from rain or sunshine and the producers had to promote their produce status inside the open location. So, loss of marketplace facilities was stated as a problem by means of 71 percent farmers (Table 6.1). Lack of pucca floor, drainage facility, supply of water and power in the marketplace vicinity also affected the farmers in selling potato at the markets.

6.3.4. High cold storage charge

In the look at regions majority of the manufacturers mentioned that high bloodless garage rate turned into a first-rate problem in case of potato storage. Table 6.1 also suggests that

about 57 percent of the producers (out of 30 farmers) reported excessive bloodless storage price as a problem which adversely affected potato cultivation.

6.3.5 Dominance of value chain actors

Value chain actors inside the take a look at vicinity were small in range but they have been properly organized. Whereas the farmers were scattered however in massive range. The fee chain actors constantly ruled the marketing gadget and that they have been in better role in setting the costs of potato. As an end result maximum of the manufacturers had been compelled to sell their potato at a decrease charge due to the fact there has been no manner to bring again the product from market because it involved greater cost of transportation and risks of potato damage. More than 54percent producers (out of 30 farers) mentioned this as a trouble.

6.4 Measures Suggested

Solving for the Problems

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

- Institutional credit facilities should be made available to the potato 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 potato 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.

- Low cost storage facilities should be developed at the primary and secondary markets by the local Government authority to provide storage facilities to the farmers.
- Farmers’ organization may be established which might improve the bargaining power of the farmers and enable them to face the value chain actors and ensure better return for potatoes.

6.5 Problems Faced by Value Chain Actors

In the study area the value chain actors were asked to mention the problems they faced in potato business. Table 7.2 the problems reported by actors are presented below.

Table 6.2 Problems faced by actors in value chain

Problems	Actors
Inadequate good transport	82%
Inadequate capital	72%
Inadequate storage facilities	68%
Inadequate market facilities	70%
Inadequate marketing information	75%
High cold storage charge	56%

(Field Survey, 2019)

6.5.1 Inadequate good transport

Table 7.2 indicates that about eighty two percent fee chain actors stated negative communication and transportation centers as a advertising trouble of potato. A big amount of advertising and marketing value changed into incurred by using investors whilst sporting their potato to the favored locations due to negative communique and transportation facilities.

6.5.2 Inadequate capital

Table 6.2 indicates that about 72 percent value chain actors reported inadequate of capital as a major marketing problem. They had to borrow money from the non-institutional sources at high interest rate in some special moment.

6.5.3 Inadequate storage facilities

Table 6.2 shows that about 68 percent value chain actors reported absence of storage facilities as problem they faced in potato business. Value chain actors complained that maximum amount of purchased potato was spoiled due to lack of proper storage facilities.

6.5.4 Inadequate marketing facilities

Table 6.2 further shows that inadequate marketing facilities were considered as a problem reported by 70 percent value chain actors. They mentioned that there was no specific market place for potato marketing, not to speak of shed and other market facilities.

6.5.5 Inadequate market information

Market information played an important role in potato trading. There was inadequate market information in potato business in the study area. About 75 percent of intermediaries reported lack of market information as one of the major problems they faced in potato business (Table 6.2).

6.5.6. High cold storage charge

The value chain actors mentioned that the rate of cold storage charge was high though some of them had to preserve potato in cold storage having no low-cost storage facilities as alternative. High rate of commission and taxes also badly affected the value chain actors in marketing potato in the study area. About 56 percent value chain actors faced problem due to high cold storage charge (Table 6.2).

6.6 Measures Suggested for Improving Marketing of Potato

The troubles stated in Table 6.2 continually hampered the sound advertising and marketing of potato. The cost chain actors, who recognized their troubles, also furnished some hints for improving the present potato advertising machine.

The value chain actors wished lots more cash cash for undertaking their companies. They cautioned that provision ought to be made via the Government for adequate and smooth mortgage from institutional assets in opposition to the security in their produce.

The value chain actors suggested specially for the development of transportation in addition to verbal exchange machine within the have a look at vicinity. Availability of adequate variety of transports might additionally increase advertising efficiency by reducing fee.

They cautioned that storage centers must be multiplied with decrease price of maintenance through the Government.

The price of potato in specific terminal markets have to be disseminated via radio, tv and newspapers which can lessen the uncertainty of charge. To ease the communication device to different terminal markets vital effort have to be taken to lessen advertising value.

CHAPTER VII

SUMMARY, CONCLUSION AND RECOMMENDATION

7.1 Summary

Potato is the third most important crop in Bangladesh. In respect of nutrient, potatoes are comparable with rice and wheat. It can easily be digestible. Although potato is a temperate crop, it can be grown in most parts of the country during the winter season. Well fertilized, sunny weather with sufficient soil moisture is appropriate for potato plantation. The optimum growth and development require a temperature range of 15-21 °C. It is being cultivated in Bangladesh since 1960 from exotic varieties specially brought from the Netherlands. At present, potato is grown in about 4.61 lac hectares of land to produce 84 lac tons. The average yield of potato is 13.32-18.08 ton/ha. Its production can be increased up to 30-40 ton/ha using high yielding varieties and improved production technology. Moreover, in recent years, potato has become an important crop for food security, especially during extreme flooding during the monsoon. Potato is the only crop for which seed stocks are kept in cold stores ready for immediate planting after floods. Increased productivity of potato, even on a small scale, is possible with efficient management of available resources and good quality seed. The study precipitated lights on the subsequent particular objectives.

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

The study was confined to a particular area where potato production was concentrated. The study was confined to two villages in the Pirgonj Upazilla under Thakurgaon district. The villages were purposively selected for collecting data from the potato farmers. Four retail markets Futani town bazar, Gonirhat bazar, Pirganj bazar and Gogor Bazar were selected from Pirganj upazila under Thakurgaon district by applying purposive sampling

technique. The sample size of the potato grower was 30. Data were collected from each of the upazila through simple random sampling technique by using random number table. Sixty other value chain actors (15 Farias, 15 Beparis, 15 wholesalers and 15 retailers) and two cold storage owners were selected from the study area by using purposive sampling. Data were also collected from some actors who worked in the valuation of marketing of potato in study areas. The actors involved in the marketing of potato included Farias, Beparis, wholesalers, retailers and cold storage owners. Two cold storage plants comprising of about 20% of the total number of cold storage plants located in the study area were selected through simple random sampling technique for the present 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 potato is an crucial vegetable in Bangladesh, the product moved from the dealers to purchasers through several modifications i.e. Through a few marketplace actors including Faria, Bepari, wholesalers and stores, because potato needs to move a protracted distance from the point of manufacturing to the clients.

In Pirgonj Upazila potato is moved from the arms of farmers to the hands of consumers thru five separate chains. Chain III is the longest producing and marketing chain. In this chain the major producing actors had been the Farmers, Farias, Beparies, wholesalers, distant wholesalers and outlets who completed fee including functions and took a portion of marketing as their potato.

Grading was more or less accomplished in line with length and exceptional of the product via the farmers and actors mostly on the idea of visual estimate. Most of the farmers and actors were self-financed for production as well as in the cost chain sports.

Farm gate price of potato received by farmers per 100Kg was Tk. 1056.56 and highest purchase price per 100Kg of potato paid by retailers was Tk. 1789.00. Highest sales price per 100Kg of potato as received by retailer was Tk. 2026.00 and the lowest sales price as received by farmers was Tk. 1325.00.

Interest on operating capital for farmer was TK. 4.70 per 100Kg of potato. Gross return, gross margin and net return received by farmer per 100Kg of potato was Tk. 1352.00, Tk. 1120.26 and Tk. 567.71, respectively.

Highest average transaction of potato received by wholesaler was 6550 Kg per day and lowest average transaction of potato received by retailer was 84.75 Kg per day. Highest marketing cost received by wholesaler was Tk. 247.00 per 100Kg of potato and lowest marketing cost received by Faria per 100Kg of potato was Tk. 25.00. On an average highest storage cost per 100Kg of potato for wholesaler was Tk. 64.18 per month and lowest storage cost per 100Kg of potato for farmer was Tk. 50.60 per month.

Among the value addition highest value added by wholesaler per 100Kg of potato was Tk. 317.00 of total value addition and lowest value added by Faria per 100Kg of potato was Tk. 217.00 of total value addition. As a percentage form of value addition highest value added by wholesaler was 14.68 percent and lowest value added by Faria was 11.58 percent of the total value addition.

Farmers of both study areas faced many problems in the production and marketing of potato. 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 potato, transportation problem, shortage of market facilities, high cold storage charge, shortage of storage facilities and dominance of value chain actors.

The study identified some major problems faced by the actors in the potato 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, shortage of storage facilities, high storage charge and inadequate marketing facilities.

The cold storage owners in the study area faced many problems in operating their activities. The major problems faced by them included inadequate capita, high interest rate on loan, uncertainty of electricity supply and income tax payment was too high. As a result, they avoid the information about their loan and tax.

7.2. Conclusion

Based on the findings of the take a look at it could be concluded reputedly that tremendous scope exists to increase the productiveness of potato and to expand the fee chain. Expanded potato cultivation can improve the dwelling fashionable of the characteristic regions of price chain.

Potato isn't most effective a source of nutrients but additionally a supply of cash income for farmers. A big wide variety of people are involved in the manufacturing and advertising and marketing of potato. So, the farmers and actors ought to honestly be benefited financially if production and advertising and marketing machine of potato are well advanced.

For stabilizing potato charges, forecasting of potato costs and goal production need to be made in time before sowing, so that the farmers can adjust potato acreage thus. With a success operation of a buffer stock, charge instability may be decreased. Government intervention in potato advertising is vital to make sure fair price to the farmers through controlling such surprising charge fluctuations.

Finally agro-processing industries especially for study area were badly wanted. For making green cost chain of potato advertising all of the actors inclusive of farmer have to have proper expertise, economic help and also excellent transportation machine.

7.3. Recommendation

There are many problems in the potato production supply chain and marketing, here some probable solutions are discussed.

- ✓ Capital facilities should be increased to improve production and marketing of potato in Bangladesh. Different financial organization and government should come forward to solve this problem.

- ✓ In the study areas disease and pest attack was one of the major problem which producers faced in potato cultivation. They also reported that they were not well trained about pest and diseases control measure on their potato cultivation. Disease are very common in potato production. Farmers facing different types of new diseases and pest management is very important for potato. BADC and other organization can solve the problem by giving proper support to the farmer.
- ✓ In the study areas majority of the producers reported that shortage of good quality seed was one of the major problems. They could not get the required quality of good seed, as its supply was insufficient to meet the demand of the buyers. For this reason, the producers used own preserved seeds and sometimes local variety of seeds. As a result, they received low yield of potato. Good quality seed is very initial for the potato. Quality seed are not available in Bangladesh. During the cultivation season supply of quality seed should be increased.
- ✓ Adequate input facilities have to be increased to the producer. Adequate input means fertilizers, seed, irrigation and other facilities needed for potato.
- ✓ Input cost should be minimize. Higher input cost is obstacle to potato production. Input cost minimizing will increase the production and control the market.
- ✓ Transportation cost is very high and for this the marketing cost is very high. Transportation cost plays vital role in potato marketing. Transportation cost should be minimize for minimize the cost of potato in the market.
- ✓ All the sample farmers reported that low price was a major problem in potato marketing. Due to lack of remunerative price of potato, the farmers of the selected areas did not get fair returns from potato cultivation. In the season every year potatoes price fall and the growers face very crucial problem. Government should develop the market policy to support the growers and marketing related people in Bangladesh.

- ✓ Markets are not available in in the season for potato. Market facilities have to be increased in Bangladesh for improving the potato production and development.
- ✓ In the study areas majority of the producers reported that high cold storage charge was a major problem in case of potato storage. About 57 percent producers (out of 30 farmers) reported high cold storage charge as a problem which adversely affected potato cultivation. Cold storage charge should be reduce.
- ✓ 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 potato. As a result most of the producers were compelled to sell their potato 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 potato damage. More than 54 per cent producers (out of 30 farers) reported this as a problem. Value chain actors dominancy have to be reduce.

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APPENDIX

DEPARTMENT OF AGRIBUSINESS AND MARKETING
Sher-e-Bangla Agricultural University
VALUE CHAIN ANALYSIS OF POTATO IN THE SELECTED AREAS OF
THAKURGAON DISTRICT IN BANGLADESH

Interview Schedule for Farmer

1. Identification:

Name :	Age :
Occupation :	Village :
Upazilla :	Mobile :

2. Identification of land:

Types of land	Area (Decimals)
Owned Cultivated	
Taken for share cropping	
Rented in	

3. Cost of Potato Cultivation:

Cost Items	Cost (Tk / 40 kg)
Variable Cost	
Human and labor cost	
Land Preparation	
Seed	
Fertilizer	
Insecticides	
Irrigation	
Fixed Cos	
Rented value of land	
Interest on operating capital	

4. After Production cost :

Cost Items	Cost (Tk / 40 kg)
Gradling, washing, sorting	
Transportation cost	
Loading and unloading	
Market toll	
Personal expense	
Unofficial payment	
Cold storage change.	

5. Problem about potato:

6. Probable Solutions of your problem:

7. Production:

Signature:

Date:

Interview Schedule for cold storage owner:

1. Identification:

Name :	Age :
Occupation :	Village :
Upazilla :	Mobile :

2. Name of the cold storage?

3. When did you start your business?

4. From where do you buy Potato? Farmer / Bepari / N.S/ Aratdar

5. Cost of cold storage owner

Cost Items	Cost
Salary and wage	
power and electisicity	
Repair and maintainace	
License fee	
Cold storage rent	
Cold storage change (40kg)	
Others	

6. Average capacity of your storage?

7. Month of storage?

8. Month of release?

9. Price before harvesting?

10. Price during harvesting?

11. Price during storage?

12. Problem about your storage?

13. Probable solution?

Signature:

Date:

Interview Schedule for Wholesaler:

1. Identification of respondent :

Name :	Age :
Occupation :	Village :
Upazilla :	Mobile :

2. When did you start your business?

3. From where do you buy potato? Farmer / Bepari / W.S / Aratdar

4. Does the price vary for different sellers? Yes / No

6. Cost of Potato Purchase (Farmer / Faria / wholesaler)

Cost Items	Cost
License	
Loading and unloading	
Transportation	
Storage cost	
Market cost	
Grading	
Mobile charge	
Personal expenses	
Unofficial expenses	
Purchase price	
Sales price	
Others	

6. Where do you sell your potato?

7. How do you set selling price?

a) Purchase + cost + fixed amount of profit b) Price set by government c) Market price d) Others

8. Are you involved in storing? Yes / No

9. How much time do you store potato?

10. What are the main problems of your business?

11. What are the solutions?

Signature:

Date:

Interview Schedule for retailer:

1. Identification of respondent :

Name :	Age :
Occupation :	Village :
Upazilla :	Mobile :

2. When did you start your business?

3. From where do you buy potato? Farmer / Bepari / W.S / Aratdar

4. Does the price vary for different sellers? Yes / No

7. Cost of Potato Purchase (Farmer / Faria / wholesaler)

Cost Items	Cost
License	
Loading and unloading	
Transportation	
Storage cost	
Market cost	
Grading	
Mobile charge	
Personal expenses	
Unofficial expenses	
Purchase price	
Sales price	
Others	

6. Where do you sell your potato?

7. How do you set selling price?

a) Purchase + cost + fixed amount of profit b) Price set by government c) Market price d) Others

8. Are you involved in storing? Yes / No

9. How much time do you store potato?

10. What are the main problems of your business?

11. What are the solutions?

Signature: Date: