MARKETING EFFICIENCY AND TRANSACTION COST ANALYSIS OF MAIZE IN SOME SELECTED AREAS OF DINAJPUR DISTRICT.

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ABSTRACT

The present study was undertaken to determine marketing efficiency and transaction cost analysis of maize from Dinajpur district of Bangladesh. This study was based on a survey of 20 farmers and 40 maize traders from Birgonj and Biral upazila of Dinajpur district. Primary data were collected from maize farmers and traders during the months of August and September, 2013. The study identified five most prominent channels of maize marketing. The channels were i) Farmers-*Farias*-wholesalers-*Aratdars*-feed mills ii) Farmers-wholesalers-*Aratdars*-feed mills iii) Farmers-*Aratdars*-feed mills iv) Farmers-wholesalers-feed mills, and v) Farmers- *Farias-Aratdars*-feed mills. Among these channels highest amount of maize (45%) moved through channel III (Farmers-*Aratdars*-feed mills) and lowest (5%) through channel I (Farmers-*Farias*-wholesalers-*Aratdars*-feed mills). The producers' share to consumers' price (89.98%) was found to be highest in channel III and lowest in channel I (75.15%). Marketing cost and marketing margin were lowest for channel III (Tk. 102.77 and Tk. 190, respectively) and highest for channel I (Tk. 312.85 and Tk. 470 respectively). The highest cost item was transportation (46.43%) and lowest was information search (0.95%). Marketing costs and marketing margins were highest for wholesalers (46.30% and 42.55%) respectively and lowest for *Farias* (20.84% and 17.02%) respectively. The deviation between maximum and minimum price of a month was highest (Tk. 257.86) in channel IV and lowest (Tk. 197.86) in channel I. Seasonal price variability was highest (74.85) in channel I and lowest (26.15) in channel III. Channel III (Farmers-*Aratdars*-Feed mills) was the most efficient channel. The main transaction cost items were search cost, screening cost, bargaining cost, monitoring cost and enforcement cost. Total transaction cost incurred by the intermediaries was Tk. 33.02 per 100 kg of maize. Search cost incurred by the intermediaries was Tk. 3.80 for 100kg of maize which was 11.52% of total transaction cost. Screening cost, monitoring cost, bargaining cost and enforcement cost were Tk. 10.26 (31.08%), Tk. 10.50 (31.80%), Tk. 8.48 (25.67%) and Tk. 0 (0%), respectively. Transaction cost for wholesalers was highest (39.10%) and lowest (30.13%) for *Farias.* Marketing problems of farmers and intermediaries were low local demand, poor transportation facilities, market toll, lack of credit facilities, absence of storage facilities, lack of adequate market information and lack of available market place. Establishment of feed mills nearest to the production point, advertising through electronic and print media, improvement of road and communication facilities, lessening of market toll, credit facilities from credit institution, improvement of storage facilities and quick and appropriate market were the possible measures to solve those problems.

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Date: 03.12.15

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Certificate

This is to certify that thesis entitled "Marketing Efficiency and Transaction Cost Analysis of Maize in Some Selected Areas of Dinajpur District" submitted to the faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE in Agribusiness & Marketing, embodies the result of a piece of a bona fide research work carried out by Md. Monirul Islam, Registration no: 07-02285 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

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Assistant Professor
Supervisor

Dated:

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ABBREVIATION AND ACRONYMS

ABBREVIATION	FULL FORM	ABBREVIATION	FULL FORM
DAM	Department of Agricultural marketing	MY	Marketing year
FAO	Food and Agriculture Organization	NGO	Non-Government Organization
GDP	Gross Domestic Product	UNFPA	United Nations Fund for Population Activities
HYV	High Yielding Variety	USDA	United States Department of Agriculture
GOB	Government of Bangladesh	Viz	Vide(L. vide licet) namely
ICT	Information and Communication Technology	WTO	World Trade Organization
INFS	Institute of Nutrition and Food Science.	BARI	Bangladesh Agricultural Research Institute
MA	Million Acres	BB	Billion Bushel
MB	Million Bushel	BBS	Bangladesh Bureau Statistics
MMT	Million Metric Ton	DAE	Department of Agricultural Extension
MoA	Ministry of Agriculture	sq.	Square
MoFDM	Ministry of Food and Disaster Management	No	Number
MT	Metric Ton	mm	Millimeter
Km	Kilogram	Kg	Kilogram
Ha	Hectare	e.g.	Exempli Gratia

CHAPTER –I

INTRODUCTION1

1.1 Background of the study

A maize, scientifically name Zea may, also known as corn or mielie, is one of the most important food grain in the world as well as Bangladesh. The main crops in Bangladesh are rice, wheat, jute, tea, tobacco, sugarcane, pulses, oilseeds, potato, spices and vegetables. Maize is a new crop of Bangladesh .The food produced in Bangladesh is not adequate to meet domestic requirements. More maize is produced, by weight, than any other grain, and almost every country on earth cultivates maize commercially for a variety of uses. The abundant cultivation of maize globally has led to concerns about mono cropping and biodiversity, especially since genetic evidence suggests that maize is radically less diverse than it was originally. In addition maize is heavily genetically modified and the crop has been used as a rallying point by the anti –genetically modified organism (GMOs).Globally maize is a staple crop, and many people rely on it as a primary source of nutrition. Maize flour is used to make nutritious bread which is highly palatable, and easily broken down in the body. It is easily digested in the body. In addition, it is practically starch-free and not fattening, and it is converted into intermediate carbohydrates and dextrin which is easily in the body. It promotes peristalsis and is also beneficial in preventing constipation. It facilities the removal of toxic food substance and also reduce stomach acidity.

1.2 Chemical composition and nutritional value of maize

1.2.1 Proximate chemical composition of main parts of maize kernels (%)

Chemical component	Pericarp	Endosperm	Germ
Protein	3.7	8.0	18.4
Ether extract	1.0	0.8	33.2
Crude fiber	86.7	2.7	8.8
Ash	0.8	0.3	10.5
Strach	7.3	87.6	8.3

Source: Watson, 1987

1.2.2 Essential amino acid content of germ protein and endosperm protein

Amino acid	Endosperm[a]		Germ[b]		FAD/WHO pattern
	mg %	mg/g N	mg %	mg/g N	
Tryptophan	48	38	144	62	60
Threonine	315	249	622	268	250
Isoleucine	365	289	578	249	250
Leucine	1024	810	1030	444	440
Lysine	228	180	791	341	340
Total sulphur amino acids	249	197	362	156	220
Phenylaianine	359	284	483	208	380
Tyrosine	483	382	343	148	380
Valine	403	319	789	340	310

Source: Orr and Waff, 1957

1.3 State of the Agriculture in Bangladesh

The predominance of agriculture in Bangladesh becomes obvious from its contribution to the Gross Domestic Product (GDP) and overall employment. During 2014-2015 the contribution of agricultural sector in GDP was 15.96 %.The sub-sectors of this sector are i) Crops and vegetables ii) Livestock iii) Forestry and iv) Fisheries and the contribution of these subsectors are 8.83%, 1.73%, 1.72% and 3.69%, respectively. Figure 1.1 shows the percentage contribution of different sectors of total GDP of the economy.

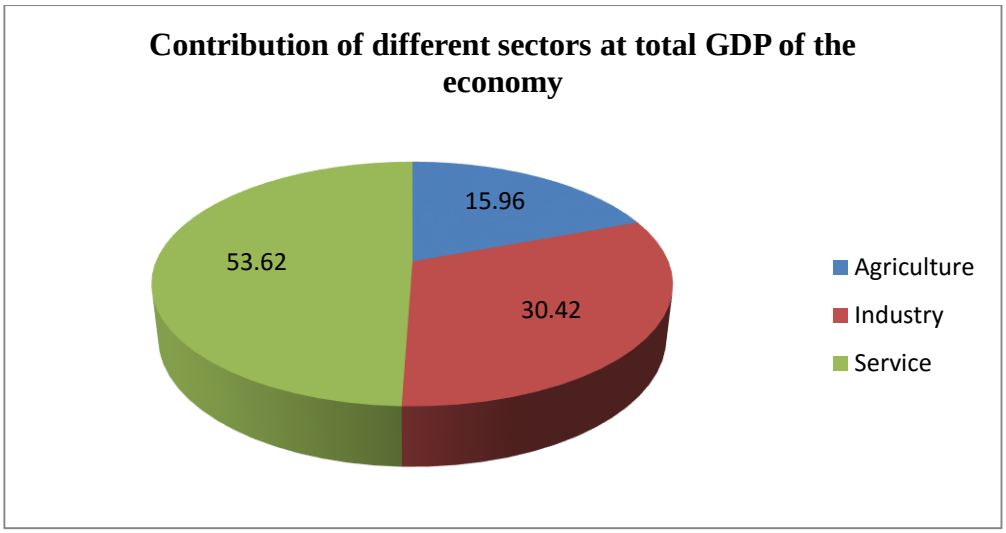

Figure 1.1: Contribution of Different Sectors of total GDP of the Economy.

Source: Bangladesh Economic Review, 2015.

It implies that service sector contributes more in the economy followed by industry sector. Agriculture sector contributes less than these two sectors. The contribution of agriculture and service sector is declining because of higher contribution of industry sector in the overall economy. The figure 1.2 shows the percentage contribution of different agricultural subsectors at total GDP.

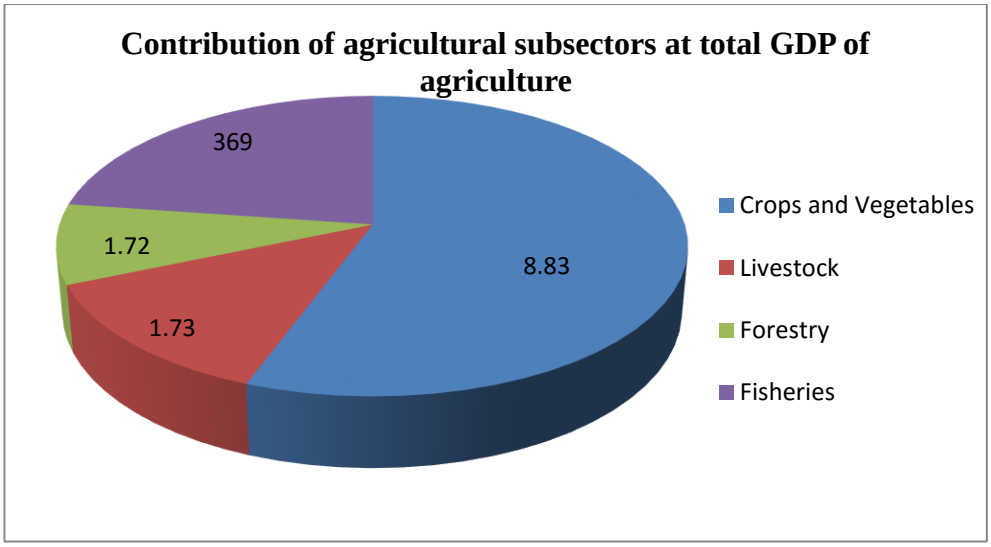

Figure 1.2: Contribution of Agricultural Subsectors of total GDP of Agriculture. Source: Bangladesh Economic Review, 2015.

It implies that among the agricultural subsectors, crops and vegetables contribute more than those of other sectors. In 2013-2014 the contribution of crops and vegetables was 12.81% but in recent year has declined at 12.27% which is however alarming.

1.4 Maize in Bangladesh

Among the cereals grown in Bangladesh, maize is the third most important crop after rice and wheat. It was introduced as relatively new crop in the cropping pattern of Bangladesh especially in the northern region (Hasan et al., 2008). Now it is grown on an estimated area of 580 thousand acres with an annual production of 887 thousand metric tons (BBS, 2013). Maize has always been considered as a minor crop in Bangladesh. Sporadic attempts were however made to promote its cultivation in the past. During the last ten years, maize had gained an increasingly important attention by government. This is mainly due to the huge demand of maize, particularly for poultry feed industry. Farmers always want to cultivate profitable and low risk crop. As farmers are getting higher yield, lower risk and higher profit from maize than rice and wheat, they are gradually diverting their efforts in maize cultivation. Therefore, maize cultivation is being rapidly expanding both in Rabi and Kharif season.

Table 1.1 provides an overview of area and production of Maize in Bangladesh.

Table 1.1: Area and Production of Maize in Bangladesh (2003-04 to 2012-13)

Year	Maize	
	Acreage ('000) acres	Production ('000 MT)
2003-2004	124	241
2004-2005	165	356
2005-2006	243	522
2006-2007	373	902
2007-2008	553	1346
2008-2009	317	730
2009-2010	376	887
2010-2011	409	1018
2011-2012	487	1298
2012-2013	580	1548

Source: BBS, 2013.

The above Table shows that acreage and production of maize is increasing at a satisfactorily rate. It was highest in acreage and production in 2012-13.It was decreased in 2008-09, than it is increasing again in terms of acreage and production.

1.5 Maize Trade (Export & Import) in Bangladesh

Bangladesh imports raw cotton, generators and accessories, textile sewing machines, steelmaking materials, pulp and wood pulp, drilling and oilfield equipment, wheat, maize grain, maize flour etc. The leading suppliers of imported goods include the China, India, Kuwait, Singapore and Hong Kong. In 2006, maize was imported worth of $359,000 which was increased up by 716% from 2005 (Workman, 2008). In 2011, 223,145 metric tons maize as grain and 818 metric tons maize flour were imported (FAO, 2012). Bangladesh generally exports garments, jute and jute goods, leather, frozen fish, fertilizers, pesticides and insecticides, cotton apparel and household goods, sporting and camping apparel, footwear and gear, wool apparel and household goods, abrasives, belting, boxes, glass, toys, sporting goods including guns and bicycles, seafood etc. Although maize was not exported earlier, but the present government is examining feasibility to export maize to help farmers for getting fair price. The probable countries for exporting maize are Malaysia, Indonesia, Saudi Arabia and the United Arab Emirates (The Financial Express, Wednesday August 1, 2012, Dhaka).

1.6 Position of Maize in the World

Major exporting countries such as the United States (U.S.), Argentina, Brazil, and the Ukraine, and importing countries such as Japan, Mexico, South Korea, Egypt, Taiwan, Columbia and Iran influence world maize price. The (U.S.) was the world's largest maize producer supplying an average of 40% of the world maize trade over the last five marketing years (MYs) (USDA, 2011). The U.S. also was the world's largest maize exporter (56%of five MY average), and the largest user of maize accounting for 36% of all maize used. The U.S. had accounted for 43% of world maize for food, seed and industrial use and 28% of world maize livestock feed use over the same time period. Since marketing year 2006/07, the U.S. had held on average 27% of world maize ending stocks, second behind China. Over the same time period, China had been the second largest producer of maize (20% of world maize production), the second largest user of maize for all purposes (18%), the second largest user of maize for food, seed and industrial uses (15%), and the second largest user of maize for livestock feeding (22%). China had ranked first globally in terms maize ending stocks over the marketing year 2006/07-2010/11 period, holding an average of 37% of world maize ending stocks - more than the 28% of world maize stocks held on average by the U.S.

1.6.1 World Maize Harvested Area

Total world maize harvested area in marketing year 2010/11 was estimated to be 397,030,000 acres (160,741,000 hectares). In marketing year 2010/11, harvested area in the U.S. was 81.4 million acres (MA), followed by China (77.8 MA), Brazil (32.9 MA), India (21.1 MA), the European Union (19.9 MA), and Mexico (16.3 MA). During the marketing year 2006/07 to 2010/11, the top 15 countries or regions in terms of maize harvested area accounted for an average of 79% of world maize harvested area (Figure 1.3). Since marketing year 2006/07 the largest nation in terms of average world maize harvested acreage was the U.S. with a five year average of 79.3 MA, accounting for 20% of world maize harvested area. The U.S. was followed by China (19%), Brazil (9%), the European Union (5%), India (5%), and Mexico (4%). It was also showed that in the five most recent maize marketing years, the U.S., China and Brazil had combined for 48% of world harvested maize area. Together with the European Union and India, the top five countries in terms of harvested maize acreage have on average accounted for 58% of global harvested maize area over the last five marketing year.

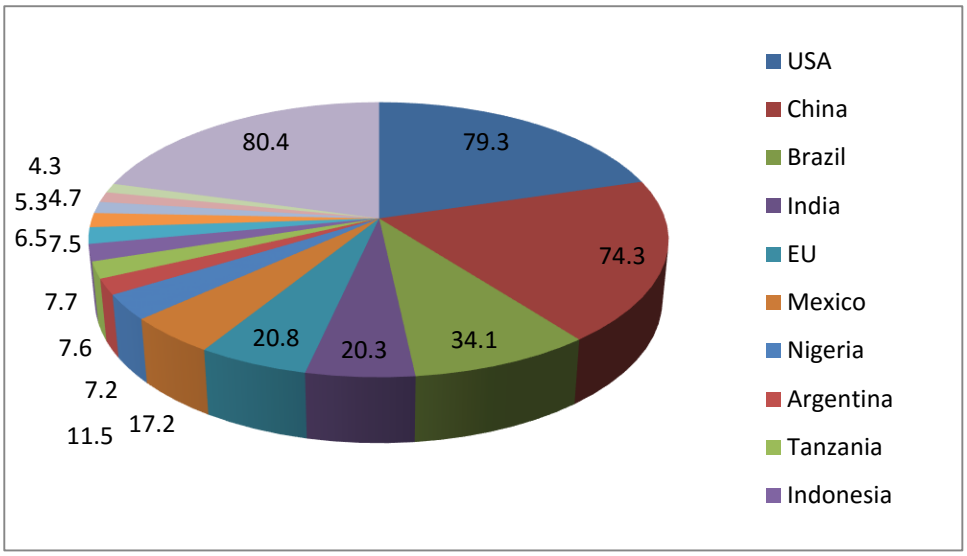

Figure 1.3: Average Maize Harvested Area for Different Countries (2006/07-2010/11).

Source: United States Department of Agriculture (www.fas.usda.gov).

1.6.2 World Maize Production

World maize production in marketing year 2010/11 was estimated to be 32.074 billion bushels (814.941 million metric tons or MMT). Note that 1 metric ton equals 2,204 pounds or 39.36 bushels of maize. In marketing year 2010/11, maize production in the U.S. was 12.4 BB, followed by China (6.6 BB), the European Union (2.2 BB) and Brazil (2.2 BB). The 15 largest maize producing countries produced an average of 90% of world maize over the last five marketing years (MY 2006/07 to MY 2010/11) (Figure 1.4). Since marketing year 2006/07, the six largest countries in terms of average world maize production were the U.S. (40% of world maize production), China (20%), the European Union (7%), Brazil (7%), Mexico (3%) and Argentina (3%). Those levels of maize production supported the perspective that the U.S. and China had key leadership roles in determination of world maize production and trade. Since China did not regularly participate in maize export market as an active exporter, most of the world's supply of exportable maize came from the U.S., Brazil and Argentina.

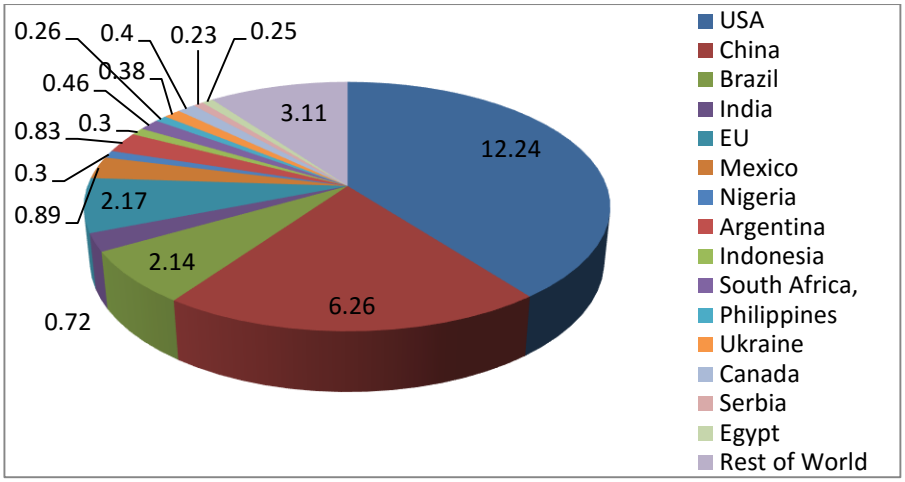

Figure 1.4: Average Maize Production for Different Countries (2006/07-2010/11). Source: United States Department of Agriculture (www.fas.usda.gov).

1.6.3 World Maize Trade (Export)

World maize export in marketing year 2010/11 was estimated to be 3.574 billion bushels (90.797 MMT). In marketing year 2010/11, maize export from the U.S. were estimated to be 1.95 BB, followed by Argentina (571 MB), Brazil (335 MB), the Ukraine (216 MB), India (98 MB), and South Africa (79 MB). The 15 largest maize exporting countries exported an average of 95% of world maize export over the last marketing years (MY 2006/07 to MY 2010/11) (Figure 1.5). Since marketing year 2006/07, the three largest countries in terms of average world maize export were the U.S. (56% of world maize export), Argentina (15%), and Brazil (10%), supplying on average 81% of world maize export. The U.S. had a dominant market leadership position in world maize export, with the next largest exporter shipping only 29% of the amount that the U.S. has over the marketing year 2006/07-2010/11 period.

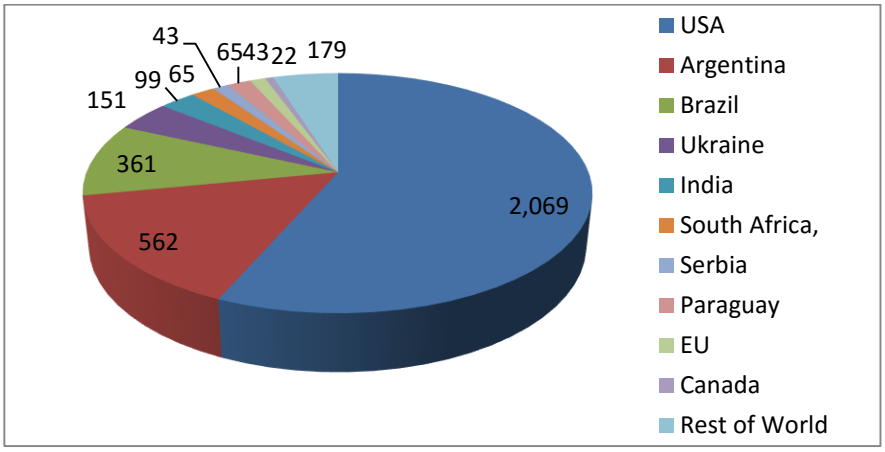

Figure 1.5: Average Maize Export for Different Countries (2006/07-2010/11). Source: United States Department of Agriculture (www.fas.usda.gov).

1.6.4 World Maize Trade (Import)

World maize import in marketing year 2010/11 was estimated to be 3.609 billion bushels (91.703 MMT). In marketing year 2010/11, Japanese maize import were estimated to be 634 MB, followed by Mexico (354 MB), South Korea (315 MB), the European Union (256 MB), Egypt (213 MB), Taiwan (185 MB), Columbia (142 MB), Iran (126 MB), Malaysia (110 MB), Algeria (94 MB), Syria (79 MB), Indonesia (79 MB), Saudi Arabia (75 MB), Morocco (71 MB), and Peru (59 MB).The 15 largest maize importing countries imported an average of 76% of world maize import over the last five marketing years (MY 2006/07 to MY 2010/11).Since marketing year 2006/07, the nine largest countries or regions in terms of average world maize import were Japan (18% of total maize import), Mexico (10%), South Korea (9%), the European Union (7%), Egypt (6%), Taiwan (5%), Columbia (4%), Iran (4%), and Malaysia (3%). (Figure 1.6) The three largest maize importing countries accounted for 37% of all world maize import over the last five years, while the 10 largest maize exporting countries or regions accounted for 67% of world maize export.

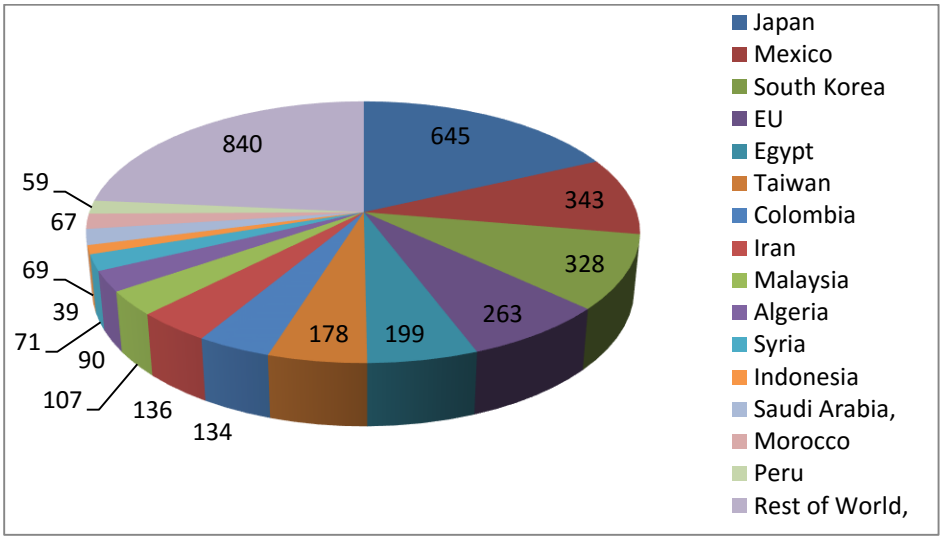

Figure 1.6: Average Maize Import for Different Countries (2006/07-2010/11).

Source: United States Department of Agriculture (www.fas.usda.gov).

1.6.5 World Maize Food, Seed and Industrial Use

World maize food, seed and industrial (FSI) use (including ethanol production) in marketing year 2010/11 was estimated to be 13.609 billion bushels (345.777 MMT). In marketing year 2010/11, maize FSI use in the U.S. was estimated to be 6.400 BB, followed by China (1.968 BB), Mexico (622 MB), the European Union (590 MB), India (374 MB), Nigeria (291 MB), Brazil (276 MB), South Africa (228 MB), Japan (181 MB), Indonesia (173 MB), Canada (169 MB), Tanzania (138 MB), Malawi (118 MB), and Kenya (114 MB).

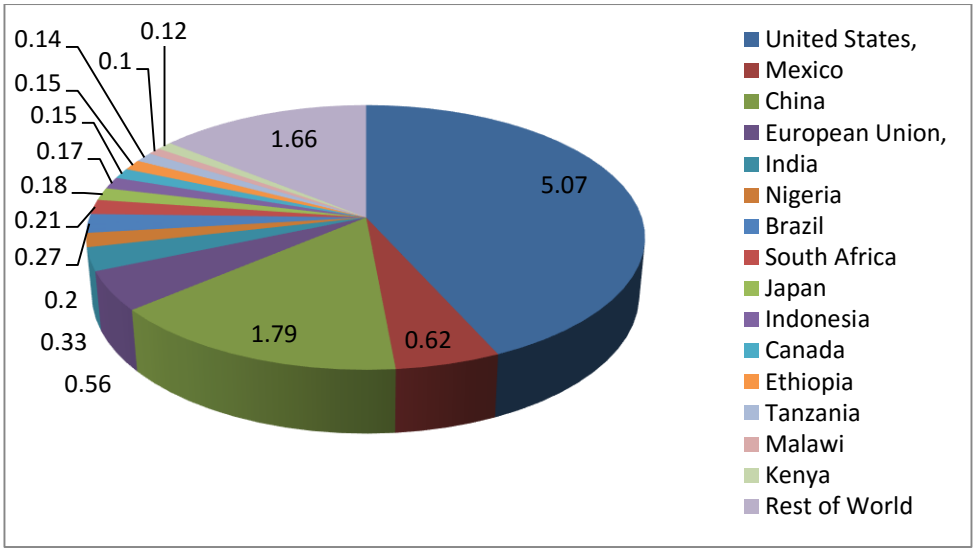

Figure 1.7: Average Food, Seed and Industrial Use of Maize for Different Countries (2006/07-2010/11).

Source: United States Department of Agriculture (www.fas.usda.gov).

The 15 largest maize FSI using countries accounted for an average of 86% of world maize FSI use over the last five marketing years (MY 2006/07 to MY 2010/11) Since marketing year 2006/07, the four largest countries or regions in terms of average world maize FSI use were the U.S. (43% of total maize FSI use), China (15%), Mexico (5%), and the European Union (5%). While the four largest countries accounted for 68% of all world maize FSI use over the last five years, the 10 largest countries or regions accounted for 80% (Figure 1.7).

1.6.6 World Maize Feed & Residual Use

World maize feed and residual use in marketing year 2010/11 was estimated to be 19.421 billion bushels (439.446 MMT). In marketing year 2010/11, maize feed and residual use in the U.S. was estimated to be 5.150 BB, followed by China (4.487 BB), the European Union (1.791 BB), Brazil (1.645 BB), Mexico (590 MB), Japan (453 MB), India (335 MB), Canada (315 MB), South Korea (236 MB), the Ukraine (224 MB), Iran (216 MB), Vietnam (209 MB), Argentina (209 MB), and the Philippines (197 MB).

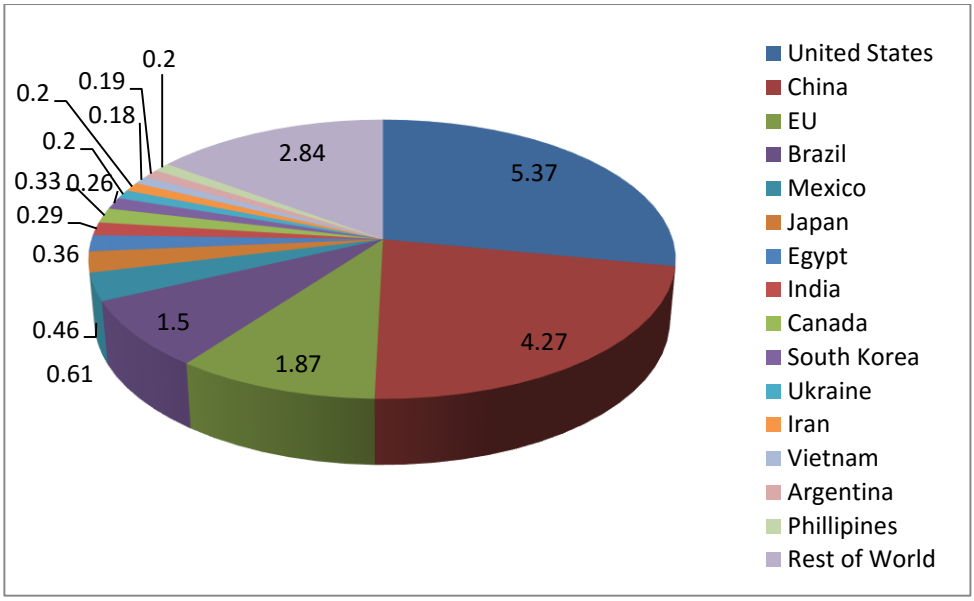

Figure 1.8: Average Feed and Residual Use of Maize for Different Countries (2006/07-2010/11).

Source: United States Department of Agriculture (www.fas.usda.gov).

The 15 largest countries accounted for an average of 85% of world maize feed and residual use over the last five marketing years (MY 2006/07 to MY 2010/11). Since marketing year 2006/07, the four largest countries or regions in terms of average world maize feed and residual use were the U.S. (28% of total maize feed and residual use), China (22%), the European Union (10%), and Brazil (8%).

1.6.7 World Domestic Use of Maize

World maize domestic use in marketing year 2010/11 was estimated to be 33.029 billion bushels (839.223 MMT). In marketing year 2010/11, maize total domestic use (excluding export) in the U.S. was estimated to be 11.550 BB, followed by China (6.455 BB), the European Union (2.381 BB), Brazil (1.921 BB), Mexico (1.212 BB), India (708 MB), Japan (634 MB), Canada (484 MB), Egypt (476 MB), South Africa (417 MB), Indonesia (354 MB), Nigeria (346 MB), South Korea (319 MB), Argentina (287 MB), and the Philippines (272 MB).

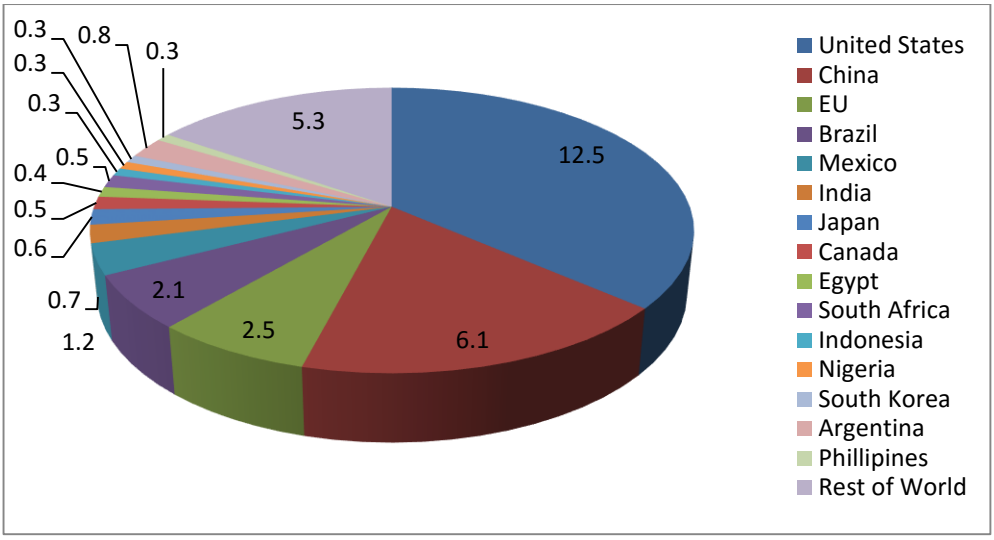

Figure 1.9: Average Domestic Use of Maize for Different Countries (2006/07-2010/11). Source: United States Department of Agriculture (www.fas.usda.gov)

The 15 largest maize using countries accounted for an average of 85% of world maize total domestic use over the last five marketing years (MY 2006/07 to MY 2010/11). Since marketing year 2006/07, the five largest countries or regions in terms of average world maize domestic use were the U.S. (36% of total domestic use), China (18%), the European Union (7%), Brazil (6%), and Mexico (4%). While the two largest countries accounted for 54% of all world maize domestic use over the last five years, the five largest countries or regions accounted for 71% of world maize domestic use (Figure 1.9).

1.7 Justification of the Study

The study investigates the marketing system, different market participants, efficient channel of maize marketing, transaction cost in maize marketing and their influence in market participation. However, the study will have important implications for farmers, researchers, policy makers and different market participants in the study area. There are some arguments supporting the importance of this study are presented below:

- Firstly, it is very much important to know, how many channels in maize marketing exist throughout the market and how many of these are most prominent, who are the market functionaries in maize market, what are the functions performed by different market intermediaries, how maize is transported throughout the market, how market information was collected and how price is determined in the maize market. This study will help to understand this marketing system better.

- Secondly, it is important to know the marketing costs and marketing margins of farmers and intermediaries. It helps to identify the different cost items, the share of different cost items to total marketing cost. Also, it helps to identify who are the most bearer of marketing cost, the level of marketing margin and net margin of market functionaries. Since all of these costs and margins indeed influence the market participants in participating in the markets. So this study will give some shed in this line.
- Thirdly, this study will help to identify the efficient channel in maize marketing. The channel through which maximum amount of product flows, the channel in which producers' share to consumers' price is highest, the channel in which marketing cost and marketing margin is lowest, the channel in which deviation between maximum and minimum price and seasonal price variation is low is said to be efficient channel.
- Fourthly, transaction costs which include search cost, screening cost, negotiation or bargaining cost, monitoring cost and enforcement cost in marketing process is generally unobserved by marketing functionaries. Market participants though incur this cost but sometime are not aware about this transaction cost. When farmers or intermediaries calculate profit margin of their marketing activities they does not include this cost because of lack of understanding. This study will help to identify and understand these costs.
- Fifthly, problems of farmers and intermediaries, solutions and recommendations are important for government officials, non-government organizations and policy makers to formulate effective marketing policy for efficient maize marketing. This study will help in this regard and
- Finally, it is worth to mention that there were many studies on maize in Bangladesh which mainly based on profitability, productivity, economic performance, technical efficiency, economic efficiency etc. But there is scanty of marketing efficiency of maize and its associated transaction costs. This study is an attempt to measure marketing efficiency of maize. Last but not least, this study also explores the transaction cost in maize marketing system in Bangladesh which is new and which could be used as a prototype study for exploring the issues further.

1.8 Objectives of the Study

The overall objective of this study is to identify marketing system, measure marketing efficiency and to analyze the transaction cost of maize marketing in Dinajpur district of Bangladesh. To attain this objective, this will:

i. Describe the marketing system of maize.
ii. Analyze costs and margins of market functionaries.
iii. Determine marketing efficiency of different marketing channels.
iv. Analyze transaction cost associated with maize marketing.

1.9 Limitations of the Study

The present study will provide some important information for farmers, traders, NGOs, extension workers, GOB and policy makers regarding production and marketing of maize. There are, however, limitations of the study which are highlighted below.

- In Bangladesh most of the farmers and traders are illiterate and they do not keep any record of their business. As a result, the accuracy and reliability of data fully depend on their memory and sincerity. Consequently, the possibility of data errors cannot be ruled out although precautions were taken to minimize the errors.
- The findings of the study are based on data of Dinajpur district. The findings should, therefore, be interpreted cautiously to generalize for the country as a whole.

1.10 Organization of the Study

With the above introduction, the remaining part of the thesis is organized as follows. Chapter II presents review of literature on marketing efficiency and transaction cost analysis. Subsequently, description of the study area and methodology is presented in chapter III. In chapter IV, V, VI and VII the objectives of the study are covered with detailed results and discussion. The VIII presents marketing problems and solutions and chapter IX presents summary, conclusion and recommendations.

CHAPTER II

REVIEW OF LITERATURE

This chapter reviews the past research works pertinent to the present study. The main topics include maize marketing system, marketing efficiency and transaction cost. Before going to discuss the literature, it is necessary to provide some concepts and definitions used throughout the thesis.

2.1 Definitions of Marketing Channel, Market Efficiency and Transaction Cost

2.1.1 Marketing Channel

According to Giles (1973), the term 'channels of distribution' refers to the system of marketing institutions through which goods or services are transferred from the original producers to the ultimate users or consumers. Most frequently a physical product transfer is involved, but sometimes an intermediate marketing institution may take title to goods without actually handling them. Kohls and Uhl (1990), cited in Duc Hai, (2003) define marketing channels as "alternative routes of product flows from producers to consumers". They focused on the marketing of agricultural products, as did their study. Their marketing channel started at the farm-gate and ended at the consumer's front door. The marketing channel approach focused on farm's selling strategies to satisfy consumer preferences. Kotler (2003) also explains marketing channels as a set of interdependent organizations involved in the process of making a product or service available for use or consumption. Most producers do not sell their goods directly to the final users; between them stands a set of intermediaries performing a variety of functions. These intermediaries constitute a marketing channel also called a trader channel or distribution channel.

2.1.2 Marketing Efficiency

Market efficiency is defined as the movement of goods from producers to consumers at the lowest cost consistent with the provision of the service that consumers desire and are able to pay for. The efficiency of a market can be evaluated (one approach) through analyzing the existing channels according to price and service provided. The prevailing price should reflect cost plus a profit margin and the profit must be just sufficient to reward investment at current interest rate. The quality of service should be neither to high nor too low in relation to cost and consumers desire. Factors that count for efficiency can also be evaluated by examining marketing enterprises for structure, conduct and performance (Abbott and Makeham, 1981).

2.1.3 Transaction Cost

Transaction cost has various meanings and explanations. Some authors (for example, Kähkönen and Leathers, 1999; Holloway *et al.,* 2002; Coase, 1937; Delgado, 1997) defined it as all cost involved in transacting a product. Some defined it as negotiation, monitoring and information cost. For the convenience of understanding, here some definitions and measurement procedure is discussed below:

Singh (2008), cited in De Silva *et al*., (2008) captured the essence of the complexity of the problem of transaction cost stating that there is no standard definition of the term while proposing that transaction cost is broadly interpreted as cost associated with market exchange. This is important because it was seven decades ago that Coase (1937), cited in De Silva et al., (2008) introduced the concept of transaction cost associated with information, negotiation, monitoring, coordination, and enforcement of contracts. Based on this transaction cost items faced by individual farms, Coase theorized the natural emergence of intermediary farms to reduce this cost. Building on Coase, Hobbs (1997), cited in De Silva et al., (2008) had classified the components of transaction cost in relation to the transaction: information cost as arising before the transaction; negotiation cost as the cost of physically carrying out the transaction; and monitoring cost as cost of ensuring that the terms of the transaction are adhered. From yet a different perspective, Key et al., (2000), cited in De Silva et al., (2008) defined transaction cost as fixed and proportional [or variable] transaction cost. Fixed transaction cost included the original search, negotiation and enforcement cost that are invariant to the volume of input as well as output.

Staal, Delgado and Nicholson (1997), cited in De Silva *et al*., (2008) classified the transaction cost into observable and unobservable transaction cost. The observable transaction cost included marketing cost such as transport, handling, packaging, storage, spoilage etc. that were visible when a transaction takes place. Unobservable transaction cost includes cost of information search, bargaining, and enforcement of contracts etc.

Holloway *et al*. (2000), cited in De Silva and Ratnadiwakara (2008) distinguish transaction cost between tangible (transportation cost, communication cost, legal cost, etc.) and intangible (uncertainty, moral hazard, etc.) cost.

Williamson (1985), cited in Cormier (2001) included "the cost of gathering and processing the information needed to carry out a transaction, of reaching decisions, of negotiating

contracts, and of policing and enforcing those contracts" in measuring transaction cost. Williamson presented four basic attributes, which organize transactions and in turn economic activity: 1) specificity of assets, 2) frequency of transactions, 3) uncertainty pertaining to resulting performance of a transaction, and 4) difficulty in measuring performance of a transaction (Williamson 1979; 1991).

Holden and Ghebru (2005) supposed that transaction cost in the land rental market may depend on many factors; Trust among (potential) partners in the land rental market. Trust may depend on cultural norms (for control of moral hazard), kinship relations among partners, previous trading experience, and information available about the (potential) partner (reputation). Transaction cost is likely to be reduced as trust increases and trust may increase with knowledge and experience from earlier contracts with the partner (as long as contracts are renewed) and may be higher among kin than non-kin.

Search, screening and negotiation cost are related to finding a partner (matching process). These may be seen as fixed up-front cost that may be especially high the first time a potential landlord or tenants attempt to enter the market and find a partner. These costs are therefore not likely to be affected much by the size of the land transaction although the loss from not doing a good job first will be larger in the case when the transaction is large. The cost per unit of land will decline with the size of the land transacted. Monitoring and enforcement cost related to following up the contract agreement may depend on the type of contract chosen, the distance between the homes of the partners and the land subject to contract, the level of trust among partners and the determinants of trust. This transaction cost may be non-convex (the cost per unit of land tend to decrease with the size of the land transacted).

North (1990), cited in Cormier (2001) defined 'transaction cost' as the cost involved in exchange or trade (eg marketing cost), cost of intangibles (e.g. search for exchange partners), contract monitoring and enforcement. Transaction cost can be explicit and/or implicit. Explicit transaction cost include transport cost, for example bus fares, while implicit transaction cost include the opportunity cost of time spent searching for new partners or customers, gathering market information, travelling and waiting time. The implicit cost is usually higher, suggesting that proximity to institutions such as markets and banking facilities is crucial.

Jaffee *et al.* (1994) listed following categories to apply transaction cost concept in agriculture:

• Search cost is the cost associated with identifying and contacting potential buyers and sellers.
• Screening cost is the cost associated with gathering information about the reliability of a particular buyer or seller, and the quality of the goods being transacted.
• Bargaining cost is the cost of gathering information on prices in other transactions, on factors that might influence the willingness to bargain by the other parties to the transaction, on implications of contract terms, etc.
• Monitoring cost includes the cost associated with monitoring contract performance.
• Enforcement cost is the cost incurred in insuring that contract provisions are met. This includes the cost associated with default provisions in contracts.
• Transfer cost includes transport, storage, processing, retailing, and wholesaling cost. This also includes the cost associated with commodity losses in storage and transport.

From the above discussions, the author identified following items of transaction cost for measuring the transaction cost in maize marketing

i. Search cost
ii. Screening cost
iii. Negotiating or bargaining cost
iv. Monitoring cost
v. Enforcement cost

The above items of transaction cost are discussed below;

2.1.3.1 Search Cost

Search cost is the cost associated with identifying and contacting potential buyers and sellers. The cost incurred in identifying the buyer to whom maize is to be sold and contacting with him may be considered as search cost.

2.1.3.2 Screening Cost

Screening cost is the cost associated with gathering information about the reliability of a particular buyer or seller, and the quality of the goods being transacted. It can be found by the difference between the price farmers or other intermediaries expected for maize and the price actually they got.

2.1.3.3 Negotiating or Bargaining Cost

Negotiating or bargaining cost is the cost of gathering information on prices in other transactions, on factors that might influence the willingness to bargain by the other party to the transaction, on implications of contract terms, etc. The entertainment cost incurred in the time of bargaining price or other terms between buying and selling parties can be considered as negotiation cost.

2.1.3.4 Monitoring Cost

Monitoring cost includes the cost associated with monitoring contract performance. When two parties negotiated they decided about transport cost and price. Generally the buying parties, who bore the transport cost, bore that monitoring responsibility or cost.

2.1.3.5 Enforcement Cost

Enforcement cost is the cost incurred in insuring that contract provisions are met. This includes the cost associated with default provisions in contracts.

2.2 Studies on Profitability, Productivity, Economic Performance, Change and Instability in Area and Production and Technical Efficiency

The existing studies (for example, Mian et al., 2010; Bakshi, 1990; Shahidullah et al., 1995; Fakrul, 1995; Mahfuzul, 1996) mainly focused on profitability and economic performance of maize-green manure-T. aman rice cropping pattern under different nutrient managements. It was concluded that the maize- mungbean-T. aman rice cropping pattern was the more productive and profitable technology in Bangladesh and Maize- GM (Dhaincha)-T. aman rice and Maize-GM (Soybean)-T. aman rice proved to be a better cropping pattern in terms of high and moderate nutrient levels.

Other studies (for example, Alam et al., 2009; Ashraf and Mollah 1995; Islam and Mian, 2004; Monlruzzaman et al., 2009; Faruq, 2008; Haque, 1999; Hussain et al., 1994; Chowdhury and Singh, 1992) focused on comparative performance of different hybrid maize under intercropping system with different crops, comparative yield of maize, barley and wheat, profitability of maize production in Bangladesh, comparison between hybrid and composite varieties of maize, change and instability in area and production of wheat and maize in Bangladesh. It was concluded that maize production was profitable and yield of hybrid maize varieties was more than the composite varieties. It was also found that the area and production of wheat increased satisfactorily, but yield was not increased to meet the

demand of the country. In the case of maize, significant increment happened in yield during the study period. Among maize, barley and wheat maize is more profitable than others.

Some studies (for example, Bhuiyan, 2005; Kibaara,2005) showed demand, supply, utilization and technical efficiency of maize at home and abroad. Studies found that annual yield growth was highest for Dhaka division and lowest for Chittagong division. It was also found that, two types of factors such as price factors and non-price factors affected the supply response of maize. Maize was used in the production of flour, boiled meal, oil, popcorn, cornflakes, preserves, starch, syrup, alcohol and nutrient media for culturing microorganisms, some medicines, extracts, pastes and other products (Noveoselov, 2002).

2.3 Studies on Marketing Efficiency

The exiting studies (for example, Sesmero et al., 2011; Groote et al., 2007; Karugia, 2003; Mallory et al., 2012) mainly focused on economic and marketing efficiency among corn ethanol plants, spatial and temporal volatility of maize prices in Kenya and role of infrastructure and government policies in determining the efficiency of maize marketing system in the post liberalization era. These studies tried to decompose the economic efficiency of a sample corn ethanol plants into internal (technical and allocative) and boundary (marketing) services. These studies evaluated the channels through which plant characteristics affect plant performances. The authors of these studies showed that, the plants very efficient from technical point of view and plants with higher production volumes seemed to perform better to secure more favorable prices (higher marketing efficiency) and executed production plans accordingly (higher allocative efficiency). In case of analyzing spatial and volatility of maize prices and effect of liberalization on marketing efficiency and volatility in Kenya showed a negative trend in real maize prices over time and price volatility had been decreasing over time. It was also showed that liberalization had a positive effect on that trend. In case of analyzing role of infrastructure and government policies in determining the efficiency of Kenya's maize marketing system in the post liberalization era showed that liberalization policy had enhanced market integration and the flow of information among markets in Kenya. It was also suggested that potential arbitrage opportunities existed between maize surplus and deficit regions and substantial infrastructural, institutional, and policy constraints hindered the exploitation of those opportunities.

2.4 Studies on Transaction Cost

The existing studies technology (for example, Jagwe, 2011; Zant, 2010; Silva et al., 2009 & 2008; Omamo, 2007; Vakis et al., 2003; Kähkönen et al., 1999; Park et al., 1996) mainly focused on transaction cost analysis of maize and cotton marketing, transaction cost, and autarky in rice and corn markets, identifying transaction cost in agriculture from the planting decision to selling at the wholesale market, measuring transaction cost from observed behavior, he impact of transaction cost on the participation of smallholder farmers and intermediaries in different markets and reducing transaction cost in agriculture through information and communication in different countries. The authors of these studies identified two types of transaction cost; fixed and proportional which distinctly affected the participation of small farmers in the markets. They identified some factors such as size of a household, distance to markets, ownership of transport means, quality of roads, availability of transport, quality of communications, and availability of credit which were related to proportional transaction cost. They showed that farmers were facilitated in information exchange which could reduce fixed transaction cost and increased the possibility of farmers to participate in markets. They also identified other factors like inefficiency or corruption in government bureaucracy, inefficiency or corruption in courts and other legal proceedings, cultural traditions and habits, ineffective isolation of policy decisions from excessive and inappropriate interest group pressure, inappropriate legal environment which could increase overall transaction cost.

2.5 Studies on Marketing Efficiency and Transaction Cost

The existing studies (for example, Zaibet et al., 2005; Gu et al., 2001) analyzed the marketing efficiency through transaction cost approach in the fruit and vegetables wholesale markets and marketing efficiency and transaction cost together in different crop and vegetables markets They tried to categorize and measure transaction cost by analyzing trader's perceptions and attitude toward regulatory measures and other market activities. They showed that the market in distant incurred more transaction cost and import license procedure risen importers' search and monitoring cost. They also showed that the increase in uninformed individuals could increase market volatility could decrease efficiency and might reduce social welfare even when market participants were perfectly rational. It was suggested that the conversion of non-tariff barriers into tariffs along WTO rules would reduce market uncertainty and increase marketing efficiency.

CHAPTER III
METHODOLOGY

Methodology is an indispensable and integral part of any study. The reliability of a specific study finding depends to a great extent on the appropriate methodology used in the study. Improper methodology very often leads to misleading result. So, careful considerations are needed by an author to follow a scientific and logical methodology for carrying out the study. The author has great responsibility in describing clearly what sorts of study design, method and procedure is to be followed in selecting the study areas, the sampling techniques and the analyses and interpretations to arrive meaningful conclusion. A chronological description of the methodology used for this study is presented below.

3.1 Study Locale

Selection of study area is an important step for any study. The study areas were purposively selected considering the following factors.

- Although maize is grown in all over the country, Dinajpur district contributes highest to the total production. In 2011-12 total production area of Dinajpur district was 153244 and production was 389148 metric tons (Source, BBS). So, on the basis of higher concentration of maize production and marketing, Dinajpur district was selected as a study area. Among different upazilas of Dinajpur district, Biral and Birgonj upazila were selected for this study because in these two upazilas both production and acres area was highest in 2011-12.By using the same criteria two unions from each upazila were purposively selected for collecting primary data. The selected unions of the upazila were Biral union and Azimpur union for Biral upazila and Birgonj union and palashbari union for Birgong upazila.
- The researcher was familiar with the local farming, local culture, belief and other characteristics of the area.

3.1.1 Description of the study area:

Dinajpur is a district in Northern Bangladesh. It is a part of the Rangpur Division. The total area of the district is about 3437.98 sq. km (1327.4 sq. mile) of which 19.45 sq. km is reverie and 78.87 sq. km is under forest. The district lies between 25°10’ and 26°04’ north latitudes and between 88°23’ and 89°18’east latitudes. It is bounded by Thakurgaon and Panchagarh districts on the north, Gaibandha and Joypurhat districts on the south, Nilphamari and

Rangpur districts on the east, the Indian state of West Bengal on the south west. Annual average highest temperature 33.5°C and lowest 10.5°C; annual rainfall 2536 mm. Main rivers are Dhepa, Punarbhaba, Kanchan and Atrai. It consists of six municipalities, 57 wards, 200 mahallas, 13 upazilas, 101 union parishads and 2142 villages. The Upazilas are Birampur, Birganj, Biral, Bochaganj, Chirirbandar, Phulbari, Ghoraghat, Hakimpur, Kaharole, Khansama, Dinajpur Sadar, Nawabganj and Parbatipur. Dinajpur experiences a hot, wet and humid tropical climate. Under the Koppen climate classification, Dinajpur has a tropical wet and dry climate. The district has a distinct monsoonal season, with an annual average temperature of 25 °C (77 °F) and monthly means varying between 18 °C (64 °F) in January and 29 °C (84 °F) in August. Total Population is 2,617,942 (According to the census of 2001 and Bangladesh Statistical Bureau) among them male 51.12%, female 48.88%. Density of population is 761.5/km2 (1,972.2/sq mi).Religious Status is (Muslim 76.65%, Hindu 20.58%, Christian 0.80%, Buddhist 0.11% and other 1.86%). Average literacy is 60%; (male 34.7% female 19.5%).The Main occupation is (agriculture 42.85%, agricultural laborer 29.19%, wage laborer 2.48%, commerce 10.2%, transport 1.67%, service 5.58%, others 8.03%).Land control situation is Landless 40%, small farmers (having 0.05-2.49 acres) 30%, medium farmers (having 2.50-7.5 acres) 25%, large farmers (having 7.5-above acres) 5%; per capita cultivable land 500m2.The number of Hats and bazaars is 508. Main agricultural crops are Paddy, wheat, sugarcane, jute, potato, vegetables, onion, garlic and oil seed (Banglapedia and Encyclopedia). Agriculture plays a critical role in the North-West economy. 85% of total population of this area is very dependent on agriculture. The most important activity in agriculture is grain production. Total land area is 852279 acre, cultivable area is 664658 acre, fallow land is 22005 acre, area under forest is 17344 acre, irrigated area is 369782 acre and area under river is 6085 acre.

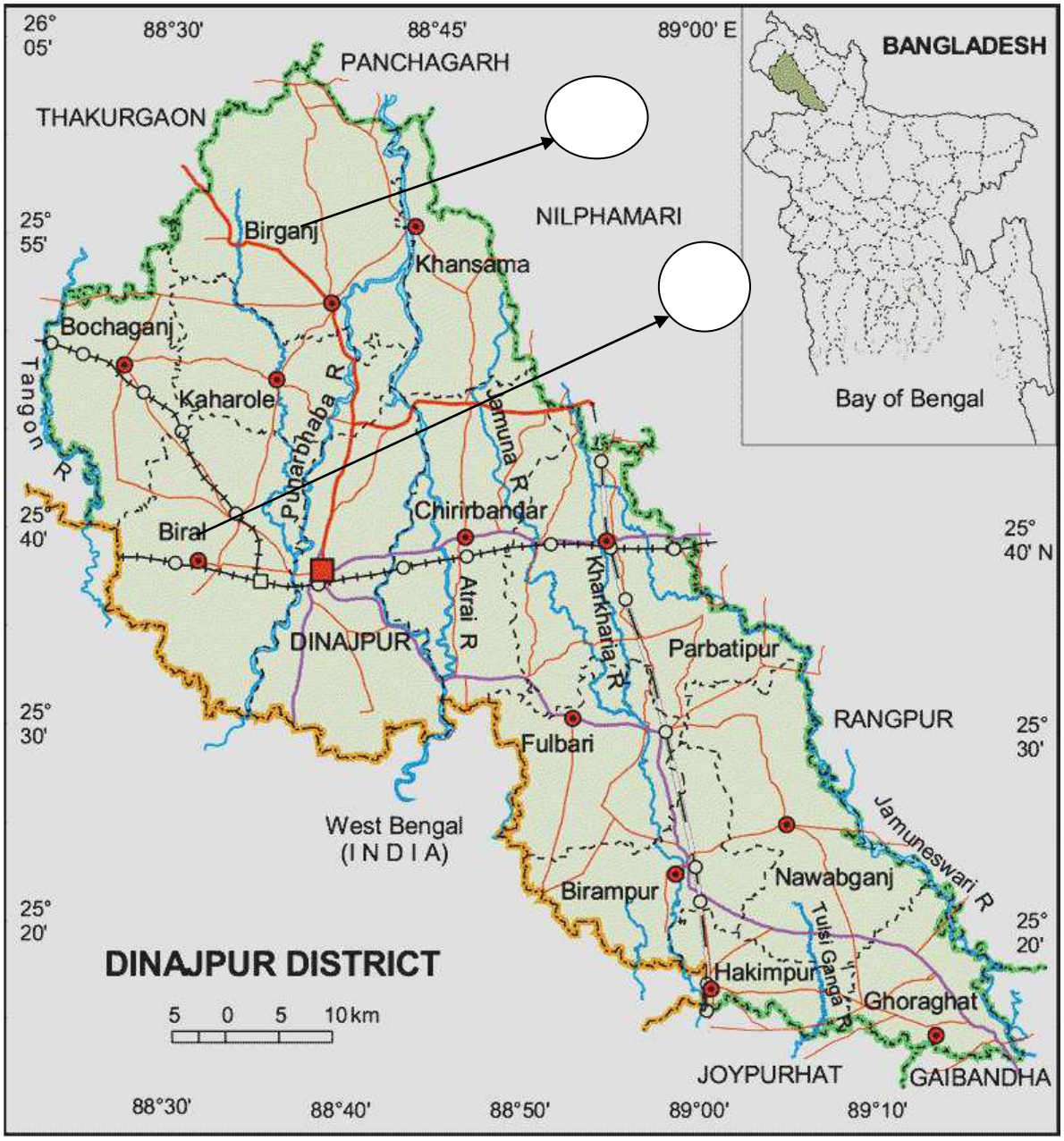

Figure 3.1: Map of Dinajpur district. ◯ Indicate the study area.

3.2 Sampling Technique and Sample

Sampling is an important part of survey work. It was not possible to interview all the farmers and traders of the study area due to time and resource constrains. Both the maize farmers and intermediaries (*Farias*, *wholesalers* and *Aratdars*) were selected purposively. In Biral and Birgonj upazila, the author had collected all data (cost of buying and selling at different marketing level, cost of processing, number of intermediaries, buying and selling price of different intermediaries in different channel etc.) to study maize marketing efficiency and transaction cost in Dinajpur district of Bangladesh. Table 3.1 shows the total number of sample that was selected purposively from both the upazilas.

. **Table 3.1: Total Number of Sample**

Respondent category	Upazila		Total sample size
	Biral	Birgonj	
Farmers	10	10	20
Farias	5	5	10
Wholesalers	8	7	15
Aratdars	8	7	15
Total			60

Source: Field Survey, 2013

3.3 Survey Instrument

The success of a study and survey depends on the proper design of the survey schedule. Keeping in mind the study objectives, a preliminary structured interview schedule was carefully designed for collecting data. The preliminary survey schedule was pre-tested with a few farmers by the author himself. During interview, if any correction, change or modifications were needed then field editing was done and thus some parts of the draft schedule were improved, modified and re-arranged in the light of the actual and practical experience gained from the pretesting. The schedule was finally developed in a simple manner so that accurate information could be obtained without repetition and misunderstanding. Author followed the main aspects of a schedule viz. the general form, question sequence and question formulation and wording to prepare schedule etc. Different set of questionnaires were prepared for different intermediaries. Questionnaire contained such type of questions which are relevant to the study objectives.

3.4 Types of Data

To fulfill the stated objectives of the present study both primary and secondary data were collected from the study areas and secondary data sources.

3.5 Sources of Data

3.5.1 Primary Data

Primary data were collected through personal interview with the respondents using questionnaire. The data collected through a questionnaire survey included the following:

a) Data on quantity of maize marketed, price of maize , distance from market, size of output, access to market, market information, land holding, credit access were collected.

b) Data on output produced and sold and marketing costs were collected and used to analyze the net returns (profitability) of maize production and the cost and price information used to construct marketing costs and margins of different intermediary.

c) Data on transaction cost of different intermediaries from their buying to selling, the item which occupy the highest among the transaction cost items were also collected.

d) Data on marketing channel exits in the study area was also collected to identify the efficient channel.

3.5.2 Secondary Data

In this study, besides primary data, secondary data were also collected from different sources. Data include monthly wholesale average price of maize in Bangladesh, world maize statistics, acreage and production of maize. The sources of secondary data were:

- Bangladesh Bureau of Statistics (BBS), Statistical Yearbook of Bangladesh, Yearbook of Agricultural Statistics
- DAM (Department of Agricultural Marketing) reports
- Bangladesh Agricultural Research Institute (BARI) and
- Internet

3.6 Period of Data Collection

Data were collected from the respondents at two phases. In 1st phase, data were collected from Biral upazila on last week of August, 2013 to 1st week of September and in 2nd phase; data were collected from Birgonj upazilla on 2nd week of September to 3rd week of September which was the peak period of maize harvest and disposal. Secondary data were collected from secondary sources on October, 2013 and 2015.

3.7 Collection of Data

Data were collected from the respondents through face to face interview. During data collection the objectives of the study were clearly explained to the respondents so that they could understand and respond freely. The traders were interviewed in maize markets and *Hats*. Farmers were interviewed at the selected village under Birgonj upazila and Biral upazila. The respondents were interviewed during their leisure time so that they could respond easily. The questions were asked systematically and in a very simple manner and the information was recorded on the interview schedule. In order to minimize errors, data were collected in local units. However, those units were later converted into standard unit.

After completion of each interview, each schedule was checked and verified to make sure that answer to each item had been properly recorded. If there were any items which were overlooked and contradictory, the respondents were again interviewed for relevant correction. Adequate measures were taken to make the information reliable and accurate and thereby to make them meaningful.

3.8 Editing and Tabulation of Data

After data collection each schedule was verified for the sake of consistency and completeness. Editing and coding were done before putting the data in computer. All the collected data were summarized and scrutinized carefully to eliminate all possible errors. The summary Tables were made in MS Excel work sheet. Interpretation, discussion of findings was presented in simple terms and finally all were arranged and compiled in the form of the thesis.

3.9 Analytical Techniques in Measuring Marketing Efficiency and Transaction Cost

Marketing efficiency has a direct bearing on the cost involved to move the produce of the farmers to the consumers. If costs are low when compared with the services involved then there is an efficient marketing system.

Prior to determining the methodology for computation, it is imperative to have an indication about marketing efficiency. The six performance indicators of marketing efficiency are (I) percentage of product which moves through the channels, (ii) producers' share to consumers' price, (iii) relative marketing costs, (iv) level of middlemen's' margin, (v) price deviation i.e. differences of maximum and minimum price of maize (vi) price variability (Chauhan et al., 1994) (indicator (ii) to (vi) are proposed by Rajagopal, 1986).

3.9.1 Percentage of Product Moves through the Channels

Percentage of product moves through a channel was measured by summing up the percentage of product handled by each middleman present in that channel.

3.9.2 Producers' share to consumers' price

Producers' share to consumers' price is the price received by the farmers expressed as a percentage of the retail price (i.e. the price paid by the consumer). If $P_{R.}$ is the retail price and P_F is the prices received at farm gate or by the producers, the producer' share in the consumers' price may be expressed as follows (Acharya, 2004):

$Ps = (P_F / P_R)^* 100$

Where,

Ps = Producers' share

P_F = Price received by the producers

P_R = Consumers price

But for the present study, following formula was used

$$\text{Producer's Share} = \frac{\text{Producer's Average price}}{\text{Weighted Average price of maize}} \times 100$$

The farmers generally sell wet maize but it goes to feed mills in dried form. This formula is used at feed mills level. The conversion ratio is 1.45 is used to convert wet maize to dry maize.

3.9.3 Marketing Cost and Marketing Margin of Different Marketing Channels

The marketing costs of different marketing channels were calculated in Taka and the channel having lower marketing cost is ranked 1 and the channel having highest marketing cost ranked last. The same approach had been followed in ranking the margin of middlemen in each channel.

The total marketing cost incurred by the farmers and intermediaries in a channel was estimated by the following formula:

$C = C_f + C_{m1} + C_{m2} + C_{m3} + \ldots\ldots\ldots\ldots + C_{mi}$

Where,

C = Total cost of maize marketing in a channel

C_f = Cost paid by the producer when commodity moves and

C_{mi} = Cost incurred by the i^{th} middlemen in the process of buying and selling of maize in a channel (i= 1, 2. 3……n)

Marketing margin of a channel was measured by using the following formula:

$M = M_f + M_{m1} + M_{m2} + M_{m3} + \ldots\ldots\ldots\ldots + M_{mi}$

Where,

M_f = Return received by farmer

M = Total margin in a channel

M_{mi} = Margin received by the i^{th} middlemen

3.9.4 Marketing Costs of Middlemen

Marketing costs of middlemen were measured by the sum of all costs for marketing maize after buying from one intermediary to selling to next intermediary.

It was measured by using the following formula:

$C = C_{p1} + C_t + C_{s1} + C_e + C_r + C_m + C_w + C_{l1} + C_{s2} + C_{l2} + C_i + C_p$

Where,

C = Total marketing cost

C_{p1} = Processing cost

C_t = Transportation cost

C_{s1} = Storage cost

C_e = Electricity cost

C_r = Rent

C_m = Market toll/tax

C_w = Weighing cost

C_{l1} = Labor cost

C_{s2} = Sack / packaging cost

C_{l2} = Load and unload cost

C_i = Information search cost

C_{p2} = Personal expense

3.9.5 Marketing Margins of Middlemen

Marketing margin is the difference purchase price and sale price.

In this study, absolute margin method was applied. This was as follows:

$\mathbf{A_M = P_R - P_P}$

Where,

A_M = Absolute margin

P_R= Total value of receipts per unit (sale price of maize)

P_p = Purchase value of maize per unit (purchase price)

3.9.6 Net Marketing Margin

Net marketing margin or profit is found by the difference between total marketing margin and marketing cost.

It was determined by using the following formula Net margin (Tk. /quintal) = Total marketing margin (Tk. / quintal) – Marketing cost (Tk. / quintal).

3.9.7 Deviation between Maximum and Minimum Price

Price deviation means the difference between maximum and minimum prices in a month. The deviation (d) between the highest and lowest price in each month in the respective channels were computed. The price equalization among all the categories of producers denote d=0. That is, there is no price deviation among the producer's prices. If the differences are high, it implies highest price deviation and vice-versa. The difference between maximum and minimum prices of each month was calculated and finally the difference of all months was summed up and then the average deviation was calculated.

The study was based the following formula:

$$\overline{\mathrm{d}} = \frac{\sum \mathrm{d}}{\mathrm{N}}$$

$\overline{d}$ = Average deviation

N = Total number of month (07 months)

d = Deviation between the maximum and minimum

3.9.8 Seasonal Price Variability

The seasonal movement of price had been studied by applying the simple standard deviation (δ) formula.

The formula used in the study is as follows:

$$\delta = \sqrt{\left(\frac{1}{\mathrm{T}}\right)} \sum \mathrm{wt}\,(\mathrm{Pt} - \mathrm{P})^2$$

Where,

δ = Seasonal price variability index

P = Average farm gate price of maize of the season in each channel

P_t = Average farm gate price of maize together for the agricultural year

T = Total months in the season

$$\mathrm{Wi} = \frac{\text{Sales during the month in each channel}}{\text{Sum of the sales during the month in channel}} \times 100$$

The entire season had been divided in two periods. Peak period represented the immediate post-harvest period of four months March to June and July to September as lean period for *Maize.* The δ was estimated separately for each period. A lower value of δ implies that the farmer's' prices are not affected by seasonality and vice versa. The final ranking of all the six indicators for all the channels was computed by the composite index formula for estimating the efficient marketing channel.

$I = \sum Ii/N$

Where, I refers to the individual rank, i = 1... 6 and

N is the number of individual ranks used.

The lowest mean represents relatively the most efficient channel and vice-versa.

3.9.9 Transaction Cost Measurement

The following items of transaction cost were collected from the farmers and intermediaries.

i. Search cost
ii. Screening cost
iii. Negotiation or bargaining cost
iv. Monitoring cost
v. Enforcement cost

Search cost

Search cost is the cost associated with identifying and contacting potential buyers and sellers. This cost information was obtained from farmers by measuring their mobile cost only for contacting to the buyers. For buying party this cost was measured as their mobile cost only used for buying maize from farmers or other intermediaries.

Screening cost

Screening cost is the cost associated with gathering information about the reliability of a particular buyer or seller, and the quality of the goods being transacted. It was measured by the difference between the price farmers or other intermediaries expected for maize and the price actually they received.

Negotiating or bargaining cost

Negotiating or bargaining cost is the cost of gathering information on prices in other transactions, on factors that might influence the willingness to bargain by the other party to the transaction, on implications of contract terms, etc. The entertainment cost incurred in the time of bargaining price or other terms between buying and selling parties was measured as negotiation cost.

Monitoring cost

Monitoring cost includes the cost associated with monitoring contract performance. When two parties negotiated they decided about transport cost and price. Monitoring cost was obtained by cost of labor that monitors the delivery of the product.

Enforcement cost

Enforcement cost is the cost incurred in insuring that contract provisions are met. This includes the cost associated with default provisions in contracts. Enforcement cost was collected by the cost of contracting.

Total transaction cost of middlemen was computed by the following formula:

$C_t = C_{s3} + C_{s4} + C_n + C_m + C_e$

Where,

C_t = Total transaction cost

C_{s3} = Search cost

C_{s4} = Screening cost

C_n = Negotiation or bargaining cost

C_m = Monitoring cost

C_e = Enforcement cost

3.10 Problems Faced during Data Collection

During the period of data collection the following problems were faced by the author

- As data were collected after harvesting period the farmers did not memorize their marketing cost properly. There was a tendency of farmers to tell exaggeratedly about their marketing cost. They tried to convince the researcher that they were not in better position. They expected that the survey could give them government incentive. In case of intermediaries it was also the same.
- When the farmers or intermediaries were asked about income, price or cost they were reluctant to give answer in a proper way. They provided average data from their memory as they did not keep any written document.

CHAPTER-IV

MARKETING SYSTEM

Marketing of any product is essential to transfer it to the final consumers from widely, scattered production points. Agricultural marketing can be defined as comprising of all activities involved in supply of farm inputs to the farmers and movement of agricultural products from the farmers to the consumers (Acharya and Agarwal, 2000). It is both a physical distribution and an economic bridge designed to facilitate the movement and exchange of commodities from farm to the fork. Marketing system composed of alternative product flows; marketing channels, a variety firm (intermediaries) and numerous business activities (marketing function). The components of maize marketing system are discussed below:

4.1 Channels of Maize Marketing

Marketing channels are routes through which agricultural products move from producers to consumers (Acharya and Agarwal, 2000). In Bangladesh, maize is mostly used in preparing poultry and fish feed. Sometimes, maize has been processed into popcorn and also consumed in roasted form. Marketing channel refers to the sequential arrangement of various marketing intermediaries involved in the movement of products from producers to consumers or user (poultry farms). The marketing channel may be short or long for a particular commodity depending on quality of the product, nature and size of consumers and producers, intermediaries, marketing services needed, etc.

The marketing channels of maize as observed in the study area are presented in Figure 4.1. From this figure the following channels are identified.

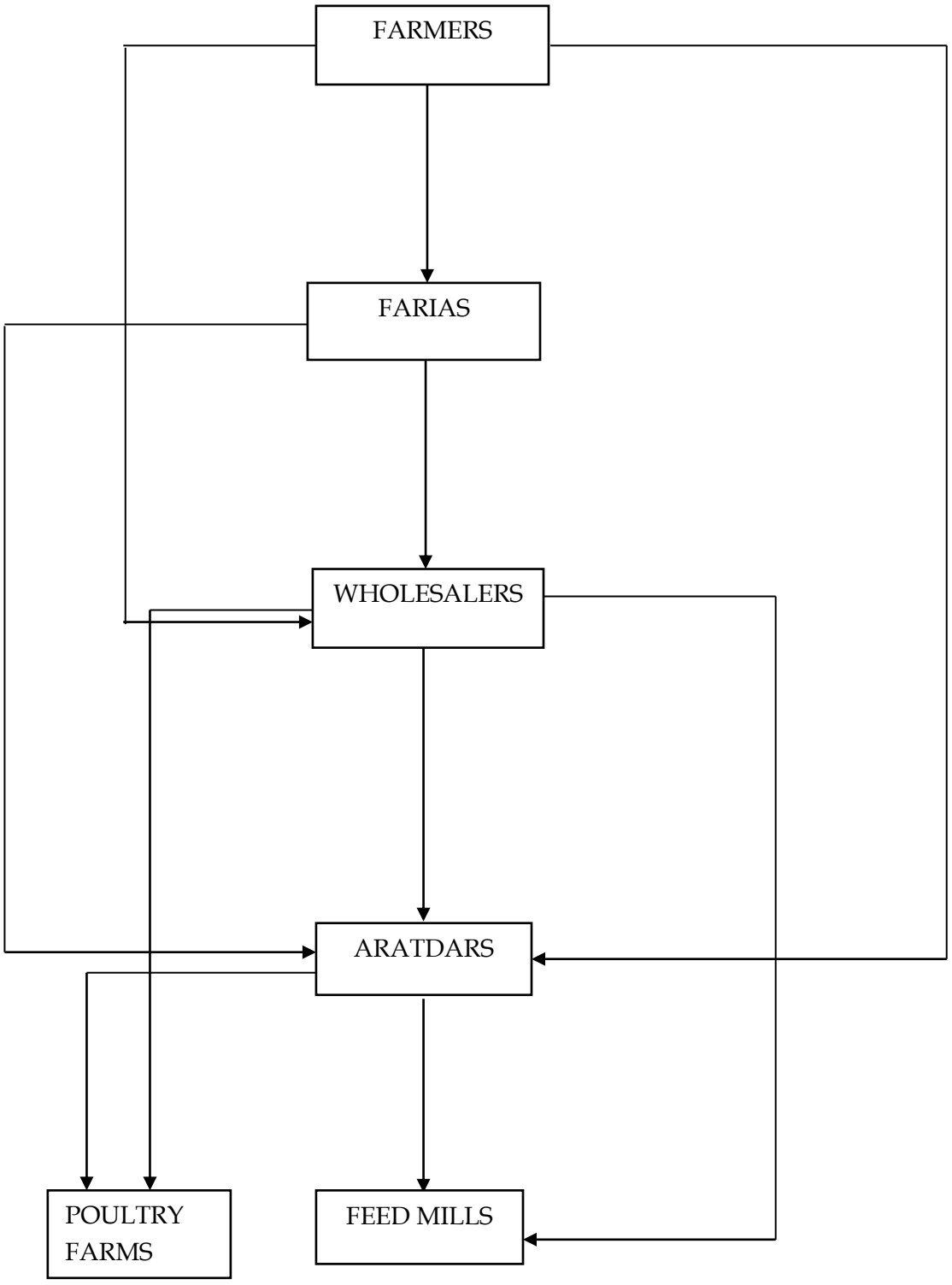

Figure 4.1: Marketing Channels of Maize in Birgonj and Biral Upazilla of Dinajpur District.

The identified channels in the study area are as follow:

Channel *I* Farmers ⟶ *Farias* ⟶ *Wholesalers* ⟶ *Aratdars* ⟶ Feed mills

Channel II Farmers ⟶ *Wholesalers* ⟶ *Aratdars* ⟶ Feed mills

Channel III Farmers ⟶ *Aratdars* ⟶ Feed mills

Channel IV Farmers ⟶ *Wholesalers* ⟶ Feed mills

Channel V Farmers ⟶ *Farias* ⟶ *Aratdars* ⟶ Feed mills

Channel VI Farmers ⟶ *Farias* ⟶ *Wholesalers* ⟶ Poultry Farms

Channel VII Farmers ⟶ *Wholesalers* ⟶ *Aratdars* ⟶ Poultry Farms

The most prominent channels are

Channel I Farmers ⟶ *Farias* ⟶ *Wholesalers* ⟶ *Aratdars* ⟶ Feed mills

Channel II Farmers ⟶ *Wholesalers* ⟶ *Aratdars* ⟶ Feed mills

Channel III Farmers ⟶ *Aratdars* ⟶ Feed mills

Channel IV Farmers ⟶ *Wholesalers* ⟶ Feed mills

Channel V Farmers ⟶ *Farias* ⟶ *Aratdars* ⟶ Feed mills

4.2 Maize Market Participants

Apart from farmers and consumers a number of intermediaries were involved in marketing of maize in the study area. Likewise the marketing systems of other agricultural products the intermediaries involved in maize marketing were *Farias, wholesalers* and *Aratdars.* A brief description of market participants is given below:

4.2.1 Farmers

Maize marketing channels started from the farmers. Farmers sell their maize to intermediaries both at market and farmyard. Farmers sold 100% of their maize to *Farias, wholesalers* and *Aratdars.* Farmers sold 30%, 25%, and 45% of their produce to the *Farias, wholesalers* and *Aratdars,* respectively.

4.2.2 Farias

Farias were found in the Biral and Birgong upazila of Dinajpur district who purchased maize from producer at the farm gate or in the local village market and sold to the *wholesalers* and *Aratdars*. They did their business independently and were self-financed in maize trading. Apart from maize trading most of the *Farias* were engaged in trading of other agricultural commodities such as paddy, jute, wheat etc. They had no permanent staff.

4.2.3 Wholesalers

The wholesalers had fixed establishments in the market places with adequate storage facilities. Apart from maize trading, most of the *wholesalers* were engaged in trading of other agricultural commodities like paddy, jute, pulses, groundnut, soybean and wheat etc. They purchased large amount of maize from farmers in the village market and a small amount was purchased from *Farias.* They had permanent staff and did their business largely. They sold large amount of maize to feed mills and small amount to *Aratdars* at local markets.

4.2.4 Aratdars

Maize *Aratdars* were the last intermediary in the channel before the feed mills or ultimate users of maize. They had permanent business premises in the upazila market. Generally, they purchased maize from *Farias* and *wholesalers.* Sometimes they bought wet maize from the farmers on the understanding that the farmers could ask them for immediate cash any time. They supplied dry maize to the feed mills within one to two days of taking an order. Those *Aratdars* who worked with feed mills had little freedom in their purchasing and selling decisions. They followed the decisions of the feed mills. All time they were stay connected with the feed mills to take decisions whether they would purchase maize or not at the prevailing market prices. They purchased 45% of maize from the farmers and the rest from the *Farias* and wholesalers. *Aratdars* had *Chatal* of their own and all processing activities such as drying, cleaning, and packaging were done at *Chatal* for sending to the feed mills. Sometimes, *Aratdars* incurred all the expenses of selling maize to feed mills. Sometimes, it was also borne by feed mills. Who would bear the expenses of buying or selling depend on the price charged for maize? The agent of feed mills came to the *Aratdars'* premises for taking maize and sometimes sent purchase volume through truck or pick-up along with the buying receipt and the feed mills paid money later. Then the *Aratdars* sent maize to the feed mills as their purchase volume and collected money at the notified date. The *Aratdars* stored maize for some days, if undelivered, at their business premise. The average period of storage varies from three to four months.

4.3 Functions of Maize Marketing

Any single activity performed in carrying a product from the point of its production to the ultimate consumer may termed as a marketing function (Acharya and Agarwal, 2000). In this study, maize marketing functions has been broken down into various functions such as buying and selling, transportation, storage, packaging, market information and pricing.

4.3.1 Buying and Selling

Buying and selling are the functions of exchange. Both have their primary objectives of negotiating terms of exchange. Percentages of maize transacted by farmers and intermediaries are shown in Table 4.1 and Table 4.2.

In Birgong and Biral upazila market, farmers were only producer of maize. They did not consume any quantity of maize; they sold 100% of their maize to *Farias*, *wholesalers* and *Aratdars*. The ultimate buyer of maize were feed mills, they bought dried maize from the *wholesalers* and *Aratdars*. *Wholesalers* bought their maize from farmers, *Farias* and *Aratdars*. The *wholesalers* and *Aratdars* sold a little percentage of their maize to poultry farms because there were a few poultry farms in the study area. It was also known from the *Aratdars* and wholesalers that they did not want to sell their maize to poultry farm due to their small amount.

Table 4.1 Buying of Maize (Percentage)

Buyers / **Sellers**	**Farmers**	***Farias***	***Wholesalers***	***Aratdars***	**Feed mills**	**Poultry farms**	**Total**
Farias	100	-	-	-	-		100
Wholesalers	60	40	-	-	-		100
Aratdars	50.	15	35	-	-		100
Poultry farms	-	-	60	40	-	-	100
Feed mills				100	-		100

Source: Field Survey, 2013.

Table 4.2 Selling of Maize (Percentage)

Buyers / **Sellers**	***Farias***	***Wholesalers***	***Aratdars***	**Feed mills**	**Poultry farms**	**Total**
Farmers	30	25	45	-	-	100
Farias	-	50	50	-	-	100
Wholesalers	-	-	37	60	3	100
Aratdars	-	-	-	95	5	100

Source: Field Survey, 2013.

4.3.2 Drying, Cleaning and Processing

After harvesting maize the farmers cleaned their maize in their farmyard with their family members. Few farmers dried maize in other's farmyard. Then they packed their maize with plastic or jute sack to prepare for selling. *Farias* bought maize from the farmers. *Farias* did not dry or clean maize. Then only bought maize from farmers and sold those to the *wholesalers*, *Aratdars* and feed mills. The *wholesalers* dried and cleaned maize in their shop or premises with their permanent or temporary labors. Sometimes they dried maize in others' *Chatal* to finally process maize for selling to *Aratdars* or feed mills. Finally, *Aratdars* dried, cleaned and packed those for selling to the feed mills. In doing this, they used their own labors. The *Aratdars* used jute sack for packing with jute ropes. They had permanent labors to do those activities.

4.3.3 Storage

Farmers and *Farias* generally did not store maize. Sometimes *wholesalers* stored maize in their shop for selling maize later. *Aratdars* stored maize at their *Go down* (store house) for two or three months for selling later to get higher price.

4.3.4 Transportation

Transportation is the lifeblood of modern marketing system. It creates place utility to the producer. Adequate and efficient transportation systems are the corner stone of modern marketing system. Farmers transported their maize by using *Van* and by-cycle. The *Farias* used *Van,* by-cycle and boat for marketing their maize. Maize was produced scattered in

different *Char* areas. In these areas, for carrying maize from scattered areas to the local markets the farmers used boat. *Wholesalers* used pick-up and truck for carrying maize to the terminal market and used *Van*, power tiller for carrying maize to the village market. *Aratdars* used truck and pick-up for carrying maize to feed mills' premise. Feed mills carried their maize by truck and pick–up as the main roads to the feed mills were developed enough that the truck and pick-up can travel easily.

Table 4.3 Modes of Transportation Used by Farmers and Intermediaries

Mode of transportation	**Farmers**	***Farias***	***Wholesalers***	***Aratdars***	**Feed mills**
Van	80	70	30	-	-
By-cycle	20	15	-	-	-
Pick-up	-	-	30	20	30
Power tillers	-	-	20	-	-
Boat	-	15	-	-	-
Truck	-	-	20	80	70

Source: Field Survey, 2013.

4.3.5 Packaging

Farias and *wholesalers* usually packed their maize with plastic and jute sack. *Aratdars* usually packed their maize with jute sack. Plastic sack was less costly than jute sack. Plastic sack could bear a weight of 50/600 kg of maize which cost Tk. 20/25 per bag. Jute sack could bear a weight of 80/90 kg of maize which cost Tk. 70 per bag. Jute sack was more preferable to plastic sack in terms of storing and easiness to carry.

4.3.6 Market Information

Information is one of the keys of marketing functions. "Accurate and timely market information facilitates producers in deciding about the price, time and place of sale of their produce" (Kohls and Uhl 2005). Table 4.4 shows that how farmers and intermediaries collected market information. In the study area, visit to market and personal observation, fellow farmers and traders and mobile phone were the main sources of market information. Mobile phone was the common mode for collecting market information. It was more or less available to all types of intermediaries and farmers. Farmers and intermediaries collected all information through visit to market and personal observation and to fellow farmers and traders.

Table 4.4 Sources of Market Information for Farmers and Intermediaries

Farmers and intermediaries	Visit to market and personal observation (%)	Fellow farmers and Traders (%)	Mobile phone (%)
Farmers	40	30	30
Farias	40	10	50
Wholesalers	50	10	40
Aratdars	50	10	40

Source: Field Survey, 2013.

4.3.7 Price Determination

Demand, supply and quality of maize influenced the market prices. All the traders involved in maize marketing followed the open bargaining method for fixing the price at the time of buying and selling of maize. The price was mainly determined by the number of buyers attending the market and the volume of maize offered for sale. Due to lack of local buyers of maize the sellers had usually low bargaining power compared to buyers.

CHAPTER-V
MARKETING COST AND MARGIN

This chapter deals with the assessment and analysis of the marketing costs and margins of different intermediaries involved in maize marketing. At the same time net margin was estimated to understand the level and extent of profit earned by the market intermediaries in performing essential marketing functions.

5.1 Marketing Cost

Marketing cost of any product represents the cost of performing various kinds of marketing functions from the point of production to the point of consumption. According to Kohls (1961), the cost of marketing represents the cost of performing the various marketing functions and operation by the various agencies involved in the marketing process. In the study area, maize farmers and traders had to bear various costs for marketing of maize. The cost components of farmers and intermediaries are discussed briefly in different Tables.

5.1.1 Marketing Cost of Farmers

The marketing cost of farmers included all cost items i.e. transportation, market toll/tax, market toll, packaging (sack), weighing and sewing, load/unload, information search and personal expenditure involved in selling of maize. The average marketing cost incurred by the farmers for 100 kg maize was calculated at Tk. 80.37 (Table 5.1). The cost of transportation accounted for 37.94% which was highest among all costs. It was mentioned earlier that the roads from farmers' house to the village market were not good and only *Van* and boat were available vehicles which charged high cost. Information search cost was lowest because for selling maize they have to contact with *Farias,* wholesalers or *Aratdars* over mobile phone which charged Tk.1or Tk.2 for a phone call. For loading/unloading and weighing of maize, farmers did it own, sometimes were done by the buyers. Processing cost was absent in case of farmers because they did not get involved in processing activities.

Table 5.1 Marketing Cost of Farmers

Cost items	Average cost (Tk. per 100 kg)	Percentage of total cost
Transportation	30.50	37.94
Market toll	15.42	19.18
Weighing	6.34	7.88
Packaging (Sack)	18.45	22.95
Load/Unload	8.20	10.20
Information search	0.50	0.62
Personal expenses	0.96	1.19
Total	80.37	100

Source: Field Survey, 2013.

5.1.2 Marketing Cost of *Farias*

The marketing cost incurred by the *Farias* for 100 kg maize was calculated at Tk. 65.20. Transportation cost was highest (37.33%) while the lowest was information search cost (1.53%) (Table5.2). Market toll/tax had to be bear by *Farias* for placing maize in the market place. That charge was collected by the *Bazar* authority. Packaging cost depended on medium of sack it was either jute sack or plastic sack. For jute sack the cost was high and low for plastic sack. The market functionaries were more intended to use jute sack because maize became well moisture than those of plastic sack. *Farias* did not have permanent shop or business premise and they did not engage in processing activities.

Table 5.2 Marketing Cost of *Farias*

Cost items	Average cost (Tk. per 100 kg)	Percentage of total cost
Transportation	24.34	37.33
Market toll/tax	10.85	16.64
Weighing	2.45	4.04
Packaging (Sack)	18.22	27.94
Load/Unload	5.50	8.43
Information search	1.00	1.53
Personal expenses	2.84	4.35
Total	65.20	100

Source: Field Survey, 2013.

5.1.3 Marketing Cost of *Wholesalers*

The marketing cost incurred by the wholesalers for 100 kg maize was calculated at Tk. 144.88 (Table 5.3). Like other traders, transportation cost was highest (52.11%) and the information search cost was lowest (0.69%). Sometimes wholesalers processed their wet maize in their *Chatal* or business premise for selling to *Aratdars* and feed mills. They had to store their maize in their shop or *Chatal* in case of undelivered. In the time of storing they had to incur storage cost. They had permanent labor for weighing, loading and unloading and packing maize. Personal expenses were highest for wholesalers than those of other intermediaries.

Table 5.3 Marketing Cost of *Wholesalers*

Cost items	**Average cost (Tk. per 100 kg)**	**Percentage of total cost**
Processing	6.2	4.27
Transportation	75.50	52.11
Storage	8.04	5.54
Electricity bill	3.66	2.52
Rent for shop	3.55	2.45
Market toll/tax	9.25	6.38
Weighing	3.98	2.74
Labor	7.00	4.83
Sack	12.70	8.76
Load/Unload	8.50	5.86
Information search	1.00	0.69
Personal expense including tips and donation	5.50	3.79
Total	144.88	100

Source: Field Survey, 2013.

5.1.4 Marketing Cost of *Aratdars*

The marketing cost incurred by the *Aratdars* for 100 kg maize was estimated at Tk. 102.77 (Table 5.4). Transportation cost was highest (44.22%) and lowest was information search cost (0.97%). The other important cost items were processing (21.83%), storage (3.83%), electricity bill (3.41%), rent (1.45%), market toll/tax (6.08%), weighing (1.75%), labor

(5.66%), sack (5.70%), loading/unloading (3.11%) and finally personal expenditure (1.94%). The marketing cost items of *Aratdars* and wholesalers were same but it was less than wholesalers because they handled more amount of maize than wholesalers. *Aratdars* had to incur more cost on processing of maize. Other intermediaries were not highly involved in that activity. Wet maize was dried or prepared for feed mills from their premises. For maintaining storage and *Chatal* they had to incur huge cost.

Table 5.4 Marketing Cost of *Aratdars*

Cost items	**Average cost (Tk. per 100 kg)**	**Percentage of total cost**
Processing	22.44	21.83
Transportation	45.45	44.22
Storage	3.94	3.83
Electricity bill	3.51	3.41
Rent for godown	1.50	1.45
Market toll/tax	6.25	6.08
Weighing	1.80	1.75
Labor	5.82	5.66
Sack	5.86	5.70
Load/Unload	3.20	3.11
Information search	1.00	0.97
Personal expense	2.00	1.94
Total	102.77	100

Source: Field Survey, 2013.

5.1.5 Total Marketing Cost of all Maize Intermediaries

Total cost of marketing of all intermediaries included all costs incurred by different types of intermediaries operating in maize marketing. Nature and extent of marketing cost varied from intermediary to intermediary. Average cost of maize marketing per 100kg of *Farias*, *wholesalers* and *Aratdars* were Tk. 65.20, Tk. 144.88, and Tk. 102.77, respectively. Cost of marketing for *wholesalers* was the highest among all intermediaries and the lowest for *Farias.* The *wholesalers* bought maize from a lot of *Farias* and farmers from different areas and sold these to different *Aratdars* and feed mills through various mode of transportation. For their buying and selling purpose they had to contact with more farmers, *Farias, Aratdars*

than other intermediaries; for these reason the marketing cost of wholesalers was highest. *Farias* were the temporary or seasonal businessmen. They bought little amount of maize and sold that little amount to *wholesalers* and *Aratdars*. For that little amount and temporary business they had to contact little; for that reason their marketing cost was low than those of other intermediaries. Total marketing cost of all intermediaries has been shown in Table 5.5. The total marketing cost incurred by all intermediaries was calculated at Tk. 312.85 per 100 kg of maize. Transportation cost was highest cost, which was 46.43% of the total marketing cost. Information search cost was lowest, which was 0.95%. Since maize was transported for long distance from farmers to ultimate users or feed mills, high transportation cost was incurred by traders at different levels of marketing.

Table 5.5: Marketing Cost of Maize for Different Intermediaries (Tk. per100kg)

Cost items	***Farias***	**Wholesalers**	***Aratdars***	**Total**	
				Cost	**Percentage**
Processing	0	6.2	22.44	28.64	9.15
Transportation	24.34	75.50	45.45	145.27	46.43
Storage	0	8.04	3.94	11.98	3.82
Electricity bill	0	3.66	3.51	7.17	2.29
Rent	0	3.55	1.50	5.05	1.61
Market toll/tax	10.85	9.25	6.25	26.35	8.42
Weighing	2.45	3.98	1.80	8.23	2.63
Labor	0	7.00	5.82	12.82	4.09
Sack	18.22	12.70	5.86	36.78	11.75
Load/Unload	5.50	8.50	3.20	17.20	5.49
Information search	1.00	1.00	1.00	3.00	0.95
Personal expense	2.84	5.50	2.00	10.34	3.30
Total	65.20	144.88	102.77	312.85	100
Percentage	20.84	46.30	32.84		

Source: Field Survey 2013.

5.2 Marketing Margin

The total marketing margin usually consists of margins at different stages of marketing and in each case the margin is the difference between the buying and selling prices of each intermediary. According to Tomek and Robinson (1979), margin has been defined as (i) the difference between the price paid by the consumers and that obtained by producers or as (ii) the prices of collection of marketing which is the outcome of the demand for and the supply of such services. The Table 5.6 shows that marketing margin of *Farias, wholesalers* and *Aratdars* were Tk. 80.00, Tk. 200 and Tk. 190, respectively. The marketing margin of wholesalers was the highest for big volume of buying and selling and lowest for *Farias* due to small amount of buying and selling. Marketing margin of wholesalers was highest than those of *Aratdars* and *Farias.* Because the wholesalers could buy maize from farmers at low price and they sold their maize to those *Aratdars* and feed mills to which they could secure more selling price. They were not highly involved in processing; they could get an advantage in that case. *Aratdars*' margin was middle between wholesalers and *Farias.* They had to pay more prices for buying maize from farmers than those of wholesalers. They purchased wet maize from farmers and *Farias* and semi processed maize from wholesalers. The wet maize lost weight after it was dried and ultimately they sold dried maize to the feed mills; for that reason their marketing margin was less than wholesalers. The marketing margin was lowest for *Farias* because of their temporary business, higher marketing cost for small volume of maize and charging minimum margin over the purchase price and marketing cost.

Table 5.6 Marketing Margin of Different Intermediaries

Intermediaries	**Purchase price (Tk./100 kg)**	**Sale price (Tk./100 kg)**	**Marketing Margin (Tk./100 kg)**	**Percentage**
Farias	860	940	80	17.02
Wholesalers	940	1140	200	42.55
Aratdars	1140	1330	190	40.42
Total			470	100

Source: Field Survey, 2013

5.3 Net Marketing Margin

Net marketing margin or profit is found by the difference between gross margin and marketing cost. In this section net marketing margin of maize was calculated for different intermediaries. The following Table 5.7 indicates that percentages of profit or net marketing margin of different intermediaries were 9.41% for *Farias*, 35.04% for wholesalers, and 55.50% for *Aratdars.* *Aratdars* received the highest marketing margin (55.50%) whereas *Farias* received the lowest net margin (9.41%) for 100 kg of maize. Net margin of *Aratdars* was highest in the study area. Marketing cost of *Aratdars* was relatively low than those of *Farias* and wholesalers due to high volume of maize trading. Though marketing margin of wholesalers was high net margin of wholesalers was less than those of *Aratdars* due to their relatively higher marketing cost. Net margin of *Farias* was lowest among intermediaries due to their higher marketing cost.

Table 5.7 Net Marketing Margin of Different Intermediaries

Intermediaries	**Gross margin (Tk./100 kg)**	**Marketing cost (Tk./100 kg)**	**Net marketing margin (Tk./100 kg)**	**Percentage of net marketing margin**
Farias	80	65.20	14.8	9.41
Wholesalers	200	144.88	55.12	35.04
Aratdars	190	102.77	87.23	55.50
Total	470	312.85	157.15	100

Source: Field Survey, 2013.

CHAPTER-VI

MARKETING EFFICIENCY

Marketing efficiency is defined as the movement of goods from producers to consumers at the lowest cost consistent with the provision of the service that consumers desire and are able to pay for. The efficiency of a market can be evaluated (one approach) through analyzing the existing channels according to price and service provided. The prevailing price should reflect cost plus a profit margin and the profit must be just sufficient to reward investment at the going interest rate. The quality of service should be neither to high nor too low in relation to cost and consumers desire. Factors that count for efficiency can also be evaluated by examining marketing enterprises for structure, conduct and performance (Abbott and Makeham, 1981).

In the present study, efficiency of different marketing channels was treated as an indicator of marketing efficiency and it was measured by using six (6) performance indicators. The six performance indicators of efficiency are: (i) percentage of product which moves through the channel, (ii) producers' share to consumers price, (iii) relative marketing costs, (iv) level of middlemen margin, (v) price deviation i.e., differences of maximum and minimum price of maize prevailing in a month (vi) Price variability (Chauhan et al., 1994). There were different marketing channels of maize prevailing in the study area which were mentioned earlier in chapter IV. On the basis of the above mentioned performance indicators the researcher took an effort to analyze the marketing efficiency that are described below in detail.

6.1 Channel Wise Maize Movement

There were five most prominent channels through which the maize moves in the study area. Maximum amount of product (maize) was moved through the channel III (farmers-*Aratdars*-feed mills). It was followed through the channel IV, V, II and I respectively. It was observed that 40% of the total produce was moved through channel III and 19.5%, 15.5%, 15%, 10% of the total produce was moved through the channel IV, V, II, I, respectively. Farmers were more intended to sell their maize directly to *Aratdars* in expecting higher price for their maize. Farmers sold their maize to *Farias* in case of quick selling. For better understanding it was assumed that farmers had 100 kg maize.Then that 100 kg maize went to the ultimate users or feed mills through different channels which were shown in the following figure: 6.1

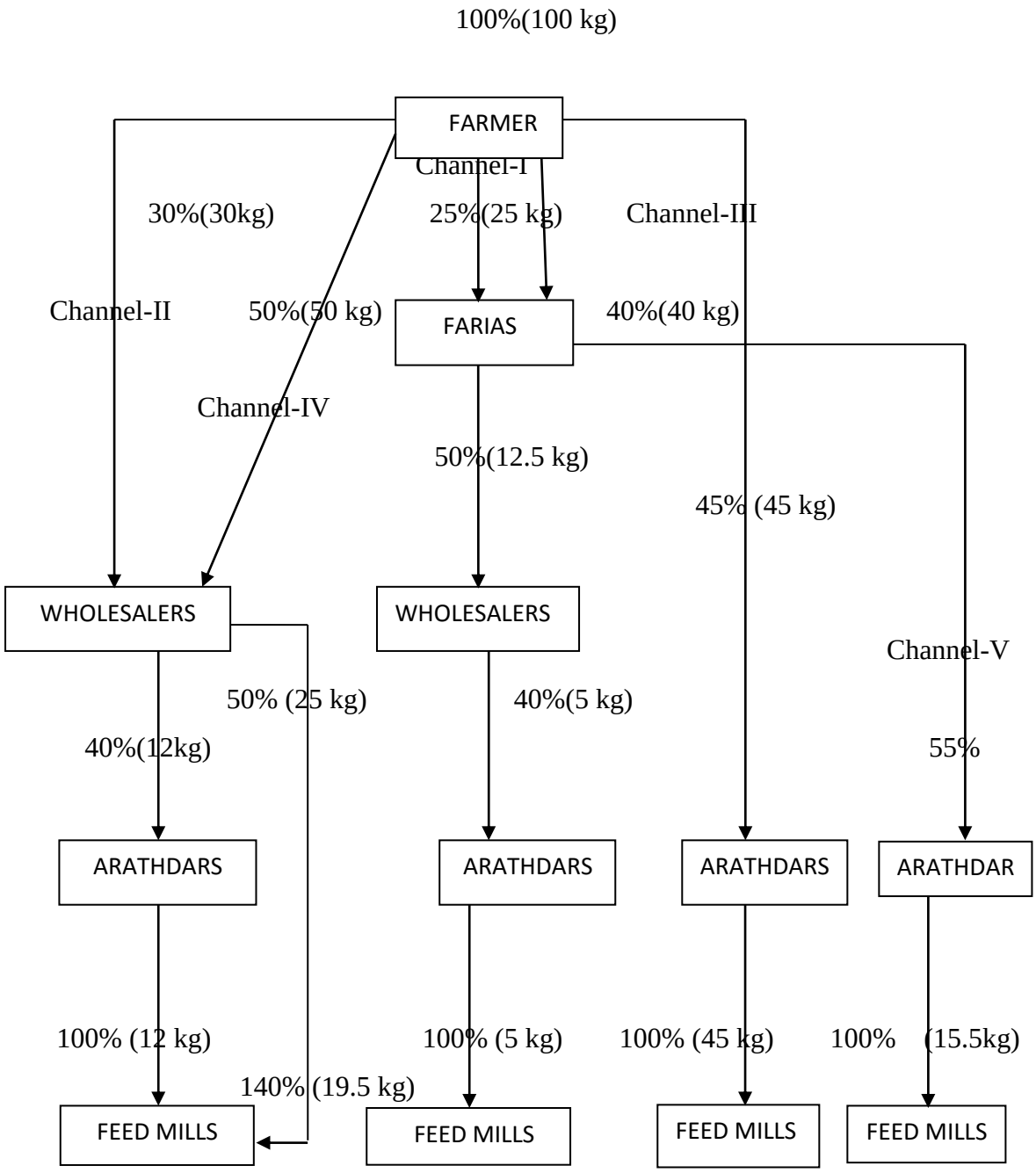

Figure 6.1: Distribution of maize through different marketing channel.

Table 6.1 Maize Moves through the Major Marketing Channels in Selected Areas.

Channels	Marketing channels	Percentage of product handled	Rank (Indicator I)
I	Farmers–*Farias*-*Wholesalers*-*Aratdars*- Feed mills	5	5
II	Farmers – *Wholesalers* - *Aratdars*- Feed mills	12	4
III	Farmers - *Aratdars*- Feed mills	45	1
IV	Farmers – *Wholesalers* - Feed mills	19.5	2
V	Farmers- *Farias*- *Aratdars*- Feed mills	15.5	3
Total		100	

Source: Field Survey, 2013

Note: Rank 1 stands for highest, rank 5 stands for lowest and so on.

6.2 Channel Wise Producers' Share to Consumers' Price

Farmers generally sold wet maize to *Farias*, *wholesalers* and *Aratdars*. Dry maize was bought by feed mills from *Aratdars* and sometimes from wholesalers. Producers' share to consumers' price was highest in channel III (89.98%) and followed by channel IV (87.54%), channel V (84.30%) and channel II (79.71%). Producer' share to consumers' price was lowest in channel I (75.15%). In channel II and IV farmers sold their maize to wholesalers and for that reason the producers' average price was same. The selling price of *Aratdars* was assumed as the consumers' price. Farmers did not have major influence on the channel. When they sold wet maize directly to the *Aratdars* there was a chance to get more shares to consumers' price. But when sold their maize to *Farias* and wholesalers they got fewer share in consumers' price than those of *Aratdars*.

Table 6.2 Channel Wise Producers' Share to Consumers' Price

Particulars	Marketing channels				
	I	**II**	**III**	**IV**	**V**
Producer average price (A)	850	862.5	869.17	862.5	850
Weighted average price of maize (B)	1131.03	1082.05	965.97	985.25	1008.25
% of producers' share (A/B)*100	75.15	79.71	89.98	87.54	84.30
Rank(indicator II)	5	4	1	2	3

Note: The conversion ratio of wet maize to dry maize is 1.45

Source: Field Survey, 2013

Note: Rank 1 stands for highest, rank 5 stands for lowest and so on.

6.3 Channel Wise Marketing Cost and Margin

High marketing margins are often regarded as '*Prima facie'* evidence of gross inefficiency in marketing and the middlemen who are blamed for being either inefficient, not bad for competition and most often regarded as the major cause of high marketing margin (Matin, 2004). High marketing margin in the less development economics are not usually associated with superior service rendered to the consumer and as such, high marketing margin was taken as an indicator of marketing inefficiency. The size and composition of marketing margin can be used as a useful measure of efficiency. Marketing cost was lowest for channel III for involving fewer numbers of intermediaries followed by channel IV, V and II, respectively. It was highest in channel I for the presence of large number of buyers. Marketing margin was also lowest for channel III followed by channel IV, V, II and I, respectively. The marketing costs and margins and net margins for different channels are presented in Table 6.3. The Table reveals that the marketing margins to the middlemen of maize marketing system amounts to be highest in channel I and the lowest in channel III. The highest marketing margin appeared due to large number of intermediaries involved in channel I as compared to other channels.

Table 6.3 Channel Wise Marketing Cost and Margin

Particulars	Marketing channels				
	I	**II**	**III**	**IV**	**V**
Marketing cost (Tk.)	312.85	219.55	102.77	144.88	158.28
Rank(indicator III)	5	4	1	2	3
Marketing margin (Tk.)	470	322.67	190	200	239.50
Rank**(indicator IV)**	5	4	1	2	3

Source: Field Survey, 2013

Note: Rank 1 stands for lowest, rank 5 stands for highest and so on.

6.4 Deviation between Maximum and Minimum Price

The price deviations of different channels for each month are presented in Table 6.4. Price deviation means the difference between maximum and minimum prices in a month. The difference between maximum and minimum prices of each month was calculated and finally the difference of all months was summed up and then the average deviation was calculated. The Table 6.4 reveals that channel I obtained the lowest price deviation followed by channel II, V and III. The price deviation was highest in channel IV.

Table 6.4 Monthly Price Deviation of Maize in Different Marketing Channels (Taka/100 kg)

Months	Maximum price	Minimum price	Marketing channels				
			I	II	III	IV	V
March	2000	1800	100	150	200	180	150
April	1875	1775	25	75	100	100	75
May	1800	1750	50	80	150	150	125
June	1500	1000	450	425	500	475	450
July	1350	1000	280	300	325	350	325
August	1350	1300	100	80	150	150	100
September	1900	1500	380	350	350	400	350
∑d			1385	1460	1775	1805	1575
N			7	7	7	7	7
$\bar{d} = \left(\frac{\sum d}{N}\right)$			197.86	208.57	253.57	257.86	225
Rank (indicator V)			1	2	4	5	3

Note: *N* = Total number of month (07 months), *d* = deviation between the maximum and minimum

Source: Field Survey, 2013 & Department of Agricultural Marketing (DAM).

Note: Rank 1 stands for lowest, rank 5 stands for highest and so on.

6.5 Seasonal Price Variability

The seasonal price variations of maize in different channels are presented in Table 6.5 and Table 6.6 for peak season and lean season, respectively. The seasonal variation in price of maize in different channels revealed that the highest price variation in prices was found in channel I and lowest in channel III in peak season (Table 6.5). It indicated that the producers would be benefited more if they sold their maize through *Aratdars*-feed mills as that channel had the lowest price variation. Producers' price was less affected by seasonality in channel III compared to other channels. On the other hand, in lean season the highest price variation in price was found in channel V and lowest in channel IV (Table 6.6). Finally for two seasons price variation was lowest in channel III and IV and highest in channel I. (Appendix 2).

Table 6.5 Channel Wise Seasonal Price Variability for Peak Season

Months	$W_t\left(P_t-\overline{P}\right)^2$	Marketing channels				
		I	**II**	**III**	**IV**	**V**
March		13.5	35.42	0.04	1.08	11.25
April		70.44	67.38	1.06	28.13	31.25
May		337.5	151.25	49	53.08	35.42
June		307.05	110.54	28.38	55.63	61.25
$\sum W_t\left(P_t-\overline{P}\right)^2$		728.49	364.58	78.49	137.92	139.17
Total number of months		4	4	4	4	4
δ		18.13	13.98	5.12	7.97	8.59
Rank		**5**	**4**	**1**	**2**	**3**

Source: Field Survey, 2013.

Table 6.6 Channel Wise Seasonal Price Variability for Lean Season

Months	$W_t\left(P_t-\overline{P}\right)^2$	Marketing channels				
		I	**II**	**III**	**IV**	**V**
July		2816.16	2000	80	168.48	3379.39
August		2000	3125	180	49.5	2812.5
September		1013.82	500	525.68	573.15	450.59
$\sum W_t\left(P_t-\overline{P}\right)^2$		5829.97	5625	785.68	791.13	6642.48
Total number of months		3	3	3	3	3
δ		74.84	71.00	26.15	25.38	76.44
Rank		4	3	2	1	5
Final rank (two period) indicator VI)		5	3	1	1	4

Source: Field Survey, 2013

Note: Rank 1 stands for lowest, rank 5 stands for highest and so on.

6.6 Channel Efficiency Measures

The efficiency of different marketing channels was drawn as the basis of ranks of all six-performance indicators by using composite index formula and the computed ranks. These are presented in Table 6.7

Table 6.7: Efficiency of Different Marketing Channels

Marketing channels	Performance indicators						Composite index ($\sum I_i / N$)	Final ranking
	I	I	I	I	I	I		
I	5	5	5	5	1	5	4.33	**5**
II	4	4	4	4	2	3	3.5	**4**
III	1	1	1	1	4	1	1.5	**1**
IV	2	2	2	2	5	1	2.33	**2**
V	3	3	3	3	3	4	3.17	**3**

Note: I_i = Total value of the ranks of performance, N = Total number of performance indicator, Rank 1 stands for lowest, rank 5 stands for highest and so on.

Source: Table 6.1, 6.2, 6.3, 6.4 and 6.6.

Table 6.7 indicates that channel III possesses the highest marketing efficiency followed by channel IV, channel V and channel II. The channel III became more efficient because maximum amount of product moves through that channel, the share of producers' was highest in that channel, marketing cost and marketing margin were lowest in that channel, deviation between maximum and minimum price was lowest in that channel and finally seasonal price variation was lowest in that channel. It can be said that if farmers could sell their produce directly through *Aratdars*- feed mills then they would be more benefitted. Farmers could be benefited to trade their maize through wholesalers -feed mills (channel IV). It can be suggested the farmers to choose the channel IV as next best alternative of channel III. The performance indicator also revealed that the channel I was not efficient in case of maize marketing. It might be due to low prices received by the producers, large number of intermediaries, more deviation between maximum and minimum price, more seasonal price variation and more marketing cost and margin.

CHAPTER-VII

TRANSACTION COST ANALYSIS

The cost incurred in the exchange of goods from the producers to consumers is the transaction cost. This chapter presents the results of different components of transaction cost in maize marketing.

7.1 Transaction Cost of Farmers

7.1.1 Search Cost

Search cost is the cost associated with identifying and contacting potential buyers and sellers. Total transaction cost incurred by the farmers was Tk. 2.82 for exchanging 100 kg of maize. They had to incur Tk. 0.91 per 100 kg of maize for searching potential buyers in the study area which was 32.12% of total transaction cost (Table 7.1). The buyers of maize were *Farias, wholesalers* and *Aratdars* who were familiar to farmers as they were from the same locality. For this reason the search cost was very little. Many of the farmers were actually reluctant to acknowledge this as a separate cost. Only the mobile cost was found as search cost because the mobile phone was often used to search the potential buyers.

7.1.2 Screening Cost

Screening cost is the cost associated with gathering information about the reliability of a particular buyer or seller, and the quality of the goods being transacted. Screening cost incurred by farmers was Tk. 0.96 per 100 kg of maize (33.94% total transaction cost) (Table 7.1). Farmers sold their maize to more or less reliable buyers like *Farias*, wholesalers, *Aratdars* in their nearest market. This reliability or trust was created because they transact with them from many years or past experience. When they sold their maize to distant buyers they had to incur some cost for knowing about their reliability through personal visit to other farmers or buyers.

7.1.3 Bargaining Cost

Negotiating or bargaining cost is the cost of gathering information on prices in different transactions, on factors that might influence the willingness to bargain by the other parties to the transaction, on implications of contract terms, etc. Bargaining cost incurred by farmers was Tk.0.96 per 100 kg of maize (33.94% total transaction cost) (Table 7.1). Bargaining between farmers and *Farias* was done at farmers' residence or *Bazar*. Bargaining between

farmers and *Aratdars* or *Farias* or wholesalers was done at farmers' residence. So, farmers had to incur some cost for their entertainment like *Pan, Bidi,* cigarette etc.

7.1.4 Monitoring Cost

Monitoring cost includes the cost associated with monitoring contract performance. Farmers did not incur monitoring cost because after selling the maize it was the responsibility of buyer to monitor the delivery of maize.

7.1.5 Enforcement Cost

Enforcement cost is the cost incurred in insuring that contract provisions are met. This includes the cost associated with default provisions in contracts. Farmers did not incur enforcement cost because they did not trade maize in contractual arrangement.

Table 7.1: Transaction Cost of Farmers

Cost items	Average cost (Tk. /100 kg)	Percentage of total cost
Search cost	0.91	32.12
Screening cost	0.96	33.94
Bargaining cost	0.96	33.94
Monitoring cost	0	0
Enforcement cost	0	0
Total	2.82	100

Source: Field Survey, 2013.

7.2 Transaction Cost of *Farias*

7.2.1 Search Cost

Farias bought maize from farmers and sold those to wholesalers and *Aratdars*. Total transaction cost incurred by *Farias* was Tk 9.95 for marketing of 100 kg maize. Average cost incurred by them was Tk. 1.42 for searching wholesalers and *Aratdars* which was 14.25% of total transaction cost. In the study area the *Farias* were available at Azimpur (Biral upazila) and Palashbari (Birgonj upazila) market. The search cost was negligible in Azimpur and Palashbari market. But when they tried to sell their maize in Biral upazila market they had to incur little transaction cost because the buyers of Biral were not familiar to them.

7.2.2 Screening Cost

Farias incurred screening cost per 100 kg of maize was Tk.3.74 which was 37.60% of total transaction cost. *Farias* generally visit to wholesalers and *Aratdars* or other *Farias* to know about the buyers. During their personal visit they had to incur this cost.

7.2.3 Bargaining Cost

Bargaining cost incurred by *Farias* was Tk. 2.84 per 100 kg of maize (28.55%). When the buyers or *wholesalers* /*Aratdars* came to *Farias'* house, they bargained about the price and in that case the *Farias* arranged some entertainment like *Pan*, *Bidi*, cigarette, tea etc.

7.2.4 Monitoring Cost

Farias incurred monitoring cost of Tk. 1.94 for per 100 kg of maize which was 19.90% of total transaction cost. The *Farias* generally monitored the delivery of their maize. If there were damage or wastage of maize they had to bear the responsibility of their own.

7.2.5 Enforcement Cost

Farias did not incur any enforcement cost because they did not trade maize in contractual arrangement with wholesalers or *Aratdars.* Contract farmers or contract businessmen were absent in the study area.

Table 7.2: Transaction Cost of *Farias*

Cost items	**Average cost (Tk./100 kg)**	**Percentage of total cost**
Search cost	1.42	14.25
Screening cost	3.74	37.60
Bargaining cost	2.84	28.55
Monitoring cost	1.94	19.90
Enforcement cost	0	0
Total	9.95	100

Source: Field Survey, 2013.

In case of *Farias,* screening cost was highest and the enforcement cost was zero, because they did not buy or sell maize in contract basis.

7.3 Transaction Cost of *Wholesalers*

7.3.1 Search Cost

Wholesalers bought maize from farmers and *Farias* and sold those to *Aratdars* and feed mills. The feed mills were situated in Dinajpur district, Bogra and Dhaka. The *Aratdars* were situated in Azimpur, Biral, Birgonj and Palashbari market. Wholesalers contacted with the feed mills over phone; with *Aratdars* over phone and personal visit. The search cost incurred by wholesalers per 100 kg of maize was Tk. 1.63 which was 12.62% of total transaction cost. It was mentioned earlier that wholesalers collected maize from various farmers and *Farias* from various places, for that reason they had to contact with them which increased their search cost.

7.3.2 Screening Cost

Screening cost incurred by wholesalers per 100 kg of maize was Tk. 3.46 which was 26.80% of total transaction cost.

7.3.3 Bargaining Cost

Bargaining cost incurred by wholesalers was Tk. 3.36 per 100 kg of maize which was 26.02% of total transaction cost. When the buying party or feed mills/*Aratdars* came to wholesalers' premises to buy wet or dry maize, they bargained about the price and in that case the wholesalers arranged some entertainment like *Pan, Bidi,* cigarette, tea, biscuits etc. The wholesalers also had to incur bargaining cost when the farmers and *Farias* came to their premises to sell their maize or to fix a price of maize.

7.3.4 Monitoring Cost

Wholesalers incurred monitoring cost per 100 kg of maize was Tk. 4.47 which were 34.57% of total transaction cost. The wholesalers generally monitored the delivery of their maize by their own. Sometimes they had a person or labor to ensure the delivery of maize to the feed mills or *Aratdars'* premises. Who would bear the wastage cost was also determined during the bargaining period, if there any damage or wastage of maize after selling.

7.3.5 Enforcement Cost

Wholesalers did not incur any enforcement cost because they did not trade maize in contract with feed mills or *Aratdars* in the study area. There was no contract business between wholesalers and other intermediaries.

Table 7.3: Transaction Cost of *Wholesalers*

Cost items	Average cost (Tk. /100 kg)	Percentage of total cost
Search cost	1.63	12.62
Screening cost	3.46	26.80
Bargaining cost	3.36	26.02
Monitoring cost	4.47	34.57
Enforcement cost	0	0
Total	12.91	100

Source: Field Survey, 2013.

In case of wholesalers screening cost was also highest and the enforcement cost was zero, because they did not buy or sell their maize in contract basis.

7.4 Transaction Cost of *Aratdars*

7.4.1 Search Cost

The search cost incurred by *Aratdars* for 100 kg of maize was Tk. 0.76 which was 7.46% of total transaction cost. That cost was negligible because the *Aratdars* were more familiar to feed mills and the feed mills were also familiar to *Aratdars*. The *Aratdars* were doing business with the feed mills for a number of years. Before selling maize to feed mills they generally contact with the feed mills over phone and fix a price. Since they sell huge volume of dry maize, then their average cost was decreased to negligible amount.

7.4.2 Screening Cost

Screening cost incurred by the *Aratdars* per 100 kg of maize was Tk. 3.06 was 30.15% of total transaction cost. *Aratdars* contacted to the feed mills for selling their maize over phone. *Arartdars* generally discuss with other *Aratdars* to know about the feed mills whether they were reliable or not. The *Aratdars* contacted to the farmers, *Farias* or wholesalers during buying maize. The *Aratdars* sometimes paid advance payment to the farmers, *Farias* or wholesalers to buy maize. Before advance payment to farmers or *Farias* or wholesalers, they knew about them through discussing with other *Aratdars* or through personal visit to them. In that purpose the *Aratdars* incurred screening cost. *Aratdars* had to maintain a good relationship with other *Arartdars*, farmers, *Farias* or wholesalers for their business and for that reason they had to incur some screening cost.

7.4.3 Bargaining Cost

Bargaining cost incurred by *Aratdars* was Tk. 2.28 per 100 kg of maize which was 22.46% of total transaction cost. When the buying party or agent of feed mills came to *Arartdars'* place to buy dry maize, they bargained about the price and in that case the *Aratdars* arranged some entertainment like *Pan, Bidi,* cigarette, tea, biscuits etc. for refreshment of the agent of feed mills or buying parties.

7.4.4 Monitoring Cost

Aratdars incurred monitoring cost per 100 kg of maize was Tk. 4.06 which was 39.93% of total transaction cost. The monitoring responsibility of the *Aratdars* was carried by salaried labors. After selling maize the monitoring responsibility handed over to the feed mills' agent or the buying party. Who will bear that cost, was also determined during pricing or bargaining time.

7.4.5 Enforcement Cost

Aratdars did not incur any enforcement cost because they did not trade maize in contract with feed mills. Sometimes they sold their maize to feed mills on credit or by taking order but no cost was incurred. Again *Aratdars* paid advance payment for buying maize from farmers, but no cost was incurred for that.

Table 7.4: Transaction Cost of *Aratdars*

Cost items	**Average cost (Tk./100 kg)**	**Percentage of total cost**
Search cost	0.76	7.46
Screening cost	3.07	30.15
Bargaining cost	2.28	22.46
Monitoring cost	4.06	39.93
Enforcement cost	0	0
Total	10.16	100

Source: Field Survey, 2013.

Among the transaction cost items monitoring cost was highest and enforcement cost was lowest in the study area.

7.5 Total Transaction Cost of All Intermediaries

Different items of transaction cost for different intermediaries are presented in Table 7.5. Table showed that, total transaction cost incurred by all the intermediaries was Tk. 33.02 per 100 kg of maize. Search cost incurred by the intermediaries was Tk. 3.80 for 100kg of maize which was 11.53% of total transaction cost incurred by the intermediaries. Screening cost incurred by the intermediaries was Tk. 10.26 for100 kg of maize which was 31.08% of total transaction cost. Bargaining cost incurred by the intermediaries was Tk. 8.48 for 100kg of maize which was 25.69% of total transaction cost incurred by them in maize trading. Monitoring cost incurred by the intermediaries was Tk. 10.50 for 100 kg of maize which was 31.78% of total transaction cost incurred by them. Enforcement cost incurred by the intermediaries per 100 kg of maize was Tk. 0 (zero) because no intermediary was found who do business with some other intermediaries for transferring maize to the feed mills.

Table 7.5: Transaction Cost of Maize for Different Intermediaries

Cost items	***Farias***	**Wholesalers**	***Aratdars***	**Total**	
				Cost	**Percentage**
Search cost	1.42	1.63	0.76	3.80	11.52
Screening cost	3.74	3.46	3.06	10.26	31.08
Bargaining cost	2.84	3.36	2.28	8.48	25.67
Monitoring cost	1.98	4.46	4.06	10.50	31.80
Enforcement cost	0	0	0	0	0
Total	9.95	12.91	10.16	33.01	100
Percentage	30.13	39.10	30.76	100	

Source: Field Survey, 2013.

The transaction cost of different intermediaries was calculated separately as a percentage of total transaction cost carried by all intermediaries. Average transaction cost incurred by all the *Farias* for trading 100 kg of maize was Tk. 9.95 which was 30.13% of total transaction cost. Average transaction cost incurred by all the *wholesalers* for trading 100 kg of maize was Tk. 12.91 which was 39.10% of total transaction cost incurred by all intermediaries. Average transaction cost incurred by all *Aratdars* for trading 100 kg of maize was Tk. 10.16 which was 30.76% of total transaction cost incurred by all intermediaries. Transaction cost for *Farias* was lowest among all intermediaries because during buying maize they had to contact

only with the farmers. During selling of maize they contacted with *Aratdars* and wholesalers who were more familiar to them. In case of *Farias* the bargaining or entertainment cost to entertain the buyers was less since they did not have permanent shop or premise and they were temporary, as a result there was a little chance to bargain with the buyers or sellers of maize. Transaction cost for wholesalers was highest among all intermediaries. *Wholesalers* had to move to more participants like farmers and *Farias* for buying maize and *Aratdars* and feed mills for selling maize. They had to contact with more participants or bargain with for buying and selling maize than other intermediaries. Transaction cost for *Aratdars* was in between the transaction cost of *Farias* and wholesalers. They had to move to more participants or bargain to more intermediaries. But during maize selling they contacted only with the feed mills. In that case they were in better position than wholesalers. They had to incur more transaction cost, but because of their high volume of buying and selling the average cost were very little.

CHAPTER-VIII

MARKETING PROBLEMS AND SOLUTIONS

This chapter presents the problems faced by the farmers and different intermediaries with some suggested solutions. These are presented and discussed below.

8.1 Problems Faced by Farmers

8.1.1 Low Local Demand

Demand for maize was not high in the study area. There were a few feed mills in the study area. Though a considerable amount of maize was grown in the study area but farmers did not get the facilities of selling maize to feed mills directly. There were a little number of poultry farms who buy a little amount of maize from farmers and *Aratdars.*

8.1.2 Dominance of Intermediaries

Although the market intermediaries were small in number but they were organized in their business activities. On contrary, farmers were large in number but they were scattered and were not organized. So, intermediaries always dominated the marketing system, thus, they were in better position in determining price. Due to dominance of intermediaries in the local market the farmers were compelled to sell their maize at a lower price.

8.1.3 Poor Transportation Facilities

Farmers reported that the roads and communication facilities were not developed in the study area. Though, the main route from local market to feed mills was considerable good but the road to local market from the farmers' premises was very poor. Therefore, the farmers had to transport their maize to local market using *Van* which cost relatively high.

8.1.4 Market Toll

Farmers had to pay market toll to the bazar authority for placing maize in the market premises. It was in money terms (Tk. 5/10 for 40 kg maize) or in quantity (0.50/0.75 kg per 40 kg). *Bazar* authority collects toll as their bargain with farmers. Farmers were also discouraged to place their maize in the market for that market toll.

8.1.5 Lack of Credit Facilities

Farmers reported that they did not get credit facilities from local non-government organizations (NGOs) or formal credit institutions for growing and selling maize. The formal

institutions offered credit facilities mainly for livestock or poultry production. The farmers were in fact in need sufficient credit facilities for maize production.

8.2 Problems Faced by Intermediaries

8.2.1 Absence of Storage Facilities

Wholesalers and *Aratdars* reported that considerable amount of maize was spoiled due to unavailability of the storage facilities. *Farias* claimed that sometimes they were compelled to sell their maize at a low price due to lack of storage facilities.

8.2.2 Lack of Credit Facilities

Farias reported that they did not get credit facilities from the formal credit organizations. There were few local NGOs who provided credit facilities to large intermediaries like *Aratdars* and wholesalers. They did not get those facilities because they were not permanent, they were temporary in business.

8.2.3 Lack of Adequate Market Information

Marketing information play an important role in maize trading. There was a lack of adequate market information in maize trading. *Farias* and wholesalers collected market information from other maize traders and current market situation using mobile phone. The *Aratdars* collected market information from feed mills and other *Aratdars* located in other markets over mobile phone.

8.2.4 Lack of Available Market Place

There was no specific market place for marketing or trading maize. The market places in the study area were for all cash crops and vegetables including maize. A lot of buyers and sellers got accumulated at the market place with their crops and vegetables. So it was difficult to bargain about the price among buyers and sellers within a small premise and crowded place.

8.2.5 Poor Road and Transport Facilities

Farias used van to carry maize to the local market from the farmers' house. Because of poor road condition, the cost was relatively high. Wholesalers and *Aratdars* used truck, pick up and sometimes *Votvoti* for trading maize.

8.3 Solutions to the Problems

8.3.1 Measures to Solve Farmer's Problems

- Farmers reported that if there were a feed mill nearest to the local market they could sell their maize directly and could get a good price. If there were a large number of poultry farms in the study area could increase maize demand, thus could produce more maize. Farmers opined that efforts should be made to increase the market demand through advertising and campaign on mass media i.e. mobile phone, radio, television and newspapers focusing on versatile uses of maize.
- Farmers reported that the road to local market from farmers' premises should be developed and reconstructed. The roads should be reconstructed in a way so that frequent flooding cannot damage road. It would lessen transportation cost of the farmers.
- Lessening of market toll either in terms of money or quantity would encourage farmers to bring their maize in the local market. They could fix a reasonable volume of maize and up to this volume no market toll would be collected for placing maize in the market. It would save small farmers from bearing excess cost. Farmers reported that if the NGOs would give credit facilities on easy terms and conditions they could produce more maize and could participate in maize marketing.

8.3.2 Measures to Solve Intermediaries' Problems

- Wholesalers and *Aratdars* expected storage facilities in the local market to store maize in the peak and lean season. It would be helpful for them to secure a good price from the buying party or feed mills. All *Farias, wholesalers* and *Aratdars* proposed to create local market demand for maize by advertising on TV, radio and in newspaper focusing on versatile use of maize. The intermediaries also expected timely credit facility from the credit organization. They also expected flexibility in case of repayment.
- The intermediaries reported to get market information from electronic and print media. They expected cordial cooperation from the agricultural extension officer. If it was possible to extend the area of market places and construct separate market places for maize it would be more profitable for intermediaries to conduct the businesses easier.

CHAPTER-IX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The chapter presents summary, conclusions and recommendations for this study. Summary of the findings are given below:

9.1 Summary of the Findings

The summary of the findings under each objective were as follows:

9.1.1 Summary of the Findings for Objective 1

To describe the marketing system of maize.

The major findings were as follows:

i. The most prominent channels of maize marketing were i) farmers – *Farias* – *wholesalers* – *Aratdars*- feed mills ii) farmers – *wholesalers* - *Aratdars* – feed mills iii) farmers – *Aratdars*– feed mills iv) farmers – *wholesalers* – feed mills v) farmers – *Farias* – *Aratdars* – feed mills.

ii. Percentage of maize movement through the marketing channels were 10%,15%, 40%, 19.5% and 15.5% for channel I, II, III, IV and V, respectively.

iii. In Birgoj and Biral upazila market, farm*ers sol*d 25% of their maize to *Farias, 30%* to *wholesalers,* 45% to *Aratdars*. *Wholesalers* purchase 60% from Farmers,40% from *Farai*, *Aratdars* purchase 50% from Faarners,15% from *Faria,*35% from *Wholesaers.* Poultry farm purchase 60% from *Wholesalera* and 40% from *Arathdars.* Feed mills purchase 100% from *Arathdars. Farias* sell 50% to *Arathdars* and 50% to *wholesalers*. *Wholesaler* sell 37% to *Arathdars*, 60% Feed mills and 3% from poultry. *Arahdars* sell 95% to feed mills and 5% poultry farms.

iv. Farmers transported their maize by using *Van* (80%) and by-cycle (20%). *Farias* used *Van,* by-cycle and boat for marketing 70%, 15% and 15% of their maize. Wholesalers used pick-up (30%) and truck (20%) for carrying maize to the terminal markets and use*d Van* (30%), power tiller (20%) for carrying maize to the village markets from farmers' house. *Aratdars* used truck (80%) and pick-up (20%) for marketing of their maize. Feed mills carried their maize by truck (70%) and pick – up (30%).

v. For market information - 40% of farmers, 40% of *Farias,* 50% of wholesalers and 50% of *Aratdars* got their market information through visit to market and personal

observation. But 30% of farmers, 10% of *Farias*, 10% of *wholesalers*, and 10% of *Aratdars* received market information through fellow farmers and traders. Finally 30% of farmers, 50% of *Farias*, 40% of *wholesalers* and 40% of *Aratdars* got market information through mobile phone.

9.1.2 Summary of the Findings for Objective 2

To analyze cost and margin of different market functionaries in maize marketing. The findings were as follows:

i. Average cost of maize marketing for *Farias, wholesalers* and *Aratdars* were Tk. 65.20, Tk. 144.88, and Tk.102.77 per 100 kg respectively. Cost of marketing for *wholesalers* was the highest among all intermediaries and the lowest for *Farias*. The total marketing costs incurred by intermediaries were calculated at Tk. 312.85 per 100 kg of maize. Transportation cost was the highest cost item, which was 46.43% of total marketing cost. Information search cost was the lowest cost item, which was only 0.95%. Since maize was transported for long distance from farmers to ultimate users or consumers, high transportation cost was incurred by traders at different stages of marketing.

ii. Marketing margins of *Farias, wholesalers* and *Aratdars* were Tk. 80.00, Tk. 200 and Tk. 190, respectively for 100 kg of maize. The marketing margin of *wholesalers* was the highest and lowest for *Farias.*

iii. Percentages of profit or net marketing margins of different intermediaries were 9.41% for *Farias*, 35.04% for wholesalers, and 55.50. % for *Aratdars. Aratdars* received the highest marketing margin (55.50%) whereas *Farias* received the lowest margin (9.41%) for 100 kg of maize.

9.1.3 Summary of the Findings for Objective 3

To determine the marketing efficiency of different marketing channels.

The findings were as follows:

i. Forty five percent of the total production moves through channel III and 19.5%, 15.5%, 15% and 5% of the total production moves through the channel IV, V, II and I, respectively. Farmers received more share to consumer's taka if they sell their maize through the channel III.

ii. Producers' share to consumers' price was highest in channel III followed by channel IV, V and II and was lowest for channel I.

iii. Marketing cost was lowest for the channel III followed by channel IV, V and II. The highest marketing cost was for channel I. Marketing margin was also lowest for channel III followed by channel IV, V and II. The highest marketing margin was observed in channel I.

iv. Channel I obtained the lowest price deviation followed by channel II, V and III. The price deviation was the highest in channel IV.

v. The highest price variation in prices was found in channel I and lowest in channel III in peak season and in lean season the highest price variation in price was found in channel V and lowest in channel IV. Finally for two seasons price variation was lowest in channel III and IV and highest in channel I.

vi. Channel III possesses the highest marketing efficiency followed by channel IV. The channel II and V achieved same composite index and channel I was not efficient in case of maize marketing.

9.1.4 Summary of the Findings for Objective 4

i. Total transaction cost incurred by the intermediaries was Tk. 33.01 per 100 kg of maize. Search cost incurred by the intermediaries was Tk. 3.80 for 100 kg of maize which was 11.52% of total transaction cost incurred by the intermediaries. Screening costs incurred by the intermediaries was Tk. 10.26 for 100 kg of maize which was 31.08% of total transaction cost. Bargaining cost incurred by the intermediaries was Tk. 8.48 for 100 kg of maize which was 25.69% of total transaction cost incurred by them. Monitoring costs incurred by the intermediaries was Tk. 10.50 for 100 kg of maize which was 31.79% of total transaction cost incurred by them. Enforcement cost incurred by the intermediaries per 100 kg of maize was Tk. 0 (zero).

ii. Average transaction cost incurred by all *Farias*, wholesalers and *Aratdars* for trading 100 kg of maize were Tk. 9.95, Tk. 12.91 and Tk. 10.16, respectively.

iii. Transaction cost was lowest for *Farias* and highest for wholesalers among all intermediaries.

9.2 Conclusions and Recommendations

The findings of the study indicate that farmers- *Aratdars*- feed mills is the most efficient channel in the study area. If the farmers do trade their maize through this channel they will get higher share to the consumers' price. The maximum amount of maize moves through that channel. Farmers generally sell their maize to the local market participants like *Farias*, wholesalers and *Aratdars* but maximum to *Aratdars*. Farmers use *Van* and by-cycle to sell their maize at the local market. Intermediaries use *Van*, pick up, *Votvoti*, boat and truck to sell their maize to the feed mills or their next intermediary. Farmers get market information through visit to local market and personal observation, and sometimes through mobile phone. Other market participants get market information through mobile phone, personal visit and personal observation to the market. Marketing cost is highest for wholesalers and lowest for *Farias*. Similar results are also found in the case of marketing margin. Seasonal price variation is lowest in channel III and IV and highest in channel I. Farmers has to incur transaction cost though it is not much. Among the transaction cost items monitoring cost was the highest and enforcement cost was absent. Among the market participants *Farias* incur lowest transaction cost and wholesalers incur the highest. The farmers and intermediaries face many problems in marketing. Given this situations, some recommendations are given below.

1) Transportation and communication system should be developed. Improved communication system can contribute greatly to reduce the transportation cost and increase overall efficiency of the maize marketing system.
2) The credit facilities should be made available to the farmers and intermediaries through formal financial institutions and NGOs on easy terms and conditions to meet the cash requirements.
3) Sufficient number of procurement centers should be established and temporary purchasing centers may be opened by government and non-government organizations to purchase maize directly from the maize farmers. Seasonal price variation of maize should be controlled by the government through controlling the supply to make the maize market efficient.
4) Government should encourage the traders to establish improved *Godowns* in private sectors so that stored product cannot be infested by insects and hampered.
5) To increase the channel efficiency the number of intermediaries should be reduced by developing a system of direct selling to the *Aratdars* or feed mills.

6) Government and non-government organization may establish sufficient number of feed mills near to the production areas to encourage farmers in maize production and marketing.
7) Marketing information should be available. For this purpose Department of Agricultural Marketing (DAM), Ministry of Food and Disaster Management (MoFDM) as well as Ministry of Agriculture (MoA) and other concerned government organizations may be entrusted with more responsibilities of disseminating market and price information. Transaction costs incurred by farmers and intermediaries must also be under consideration. An accurate and complete database of maize traders should be maintained which will help the farmers to lessen the cost of searching the potential buyers.

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APPENDICES

Appendix 1: Area and Production of Maize (Rabi & Kharif) by Region, 2007-08 to 20011-12

(Area in acres and production in metric tons)

Region	2007-08		2008-09		2009-10		2010-11		2011-12	
	Area	**Prod.**	**Area**	**Prod.**	**Area**	**Prod.**	**Area**	**Prod.**	**Area**	**Prod.**
Bandarban	375	125	395	127	343	281	300	278	295	249
Chittagong	150	221	83	97	104	139	92	145	91	530
Comilla	14335	22277	13260	19170	16696	26335	15096	26603	20885	38397
Khagrachhari	445	890	397	380	422	411	562	425	669	696
Noakhali	34	21	18	15					15	15
Rangamati	1478	1422	1491	1442	693	706	1459	1500	1421	1417
Sylhet			85	105	-	-	-	-	-	-
Dhaka	25673	56942	20225	36582	22257	41058	23109	47644	25638	59720
Faridpur	1099	2339	1336	940	534	622	253	281	522	1297
Jamalpur	3967	8696	2806	5962	2280	2085	863	2109	863	2109
Kishorganj	1937	2557	1850	1853	481	747	2797	4562	3422	6410
Mymensingh	1154	1300	902	1591	726	1093	574	1014	554	576
Tangail	2598	5617	930	1718	123	198	251	466	644	799

Barisal	110	62	843	1194	267	507	938	1554	1816	3507
Jessore	25738	64977	10140	25701	13086	36457	19030	55889	20966	63289
Khulna	63	103	141	291	69	133	350	405	556	1488
Kushtia	103559	240434	31862	63196	72586	193863	84481	229019	110561	343015
Patuakhali	691	1703	476	750	249	713	251	347	284	361
Bogra	31245	73439	20160	45768	16558	39402	19037	42755	20066	44965
Dinajpur	124534	297396	121026	297515	108884	153627	131385	316279	153244	389148
Pabna	24340	64147	5909	14345	5940	15006	57151	13639	8332	20171
Rajshahi	72794	149587	18491	33460	20162	35594	16317	29524	17865	35125
Rangpur	112855	349181	64512	172956	92372	234972	86154	243844	98080	284825
Bangladesh	549170	1343444	317253	729629	375628	887391	409070	1018282	486859	1298109

Source: BBS (2011-12)

Appendix 2: Peak and Lean Period Price (Taka/100 kg) of Maize.

Peak Period	Channel I		Channel II		Channel III		Channel IV		Channel V	
	Mean P	**Mean Pt**	**Mean P**	**Mean Pt**	**Mean P**	**Mean Pt**	**Mean P**	**Mean Pt**	**Mean P**	**Mean Pt**
March	1680	1687.5	1675	1687.5	1687	1687.5	1685	1687.5	1680	1687.5
April	1670	1687.5	1670	1687.5	1685	1687.5	1675	1687.5	1670	1687.5
May	1650	1687.5	1660	1687.5	1670	1687.5	1670	1687.5	1650	1687.5
June	1650	1687.5	1665	1687.5	1675	1687.5	1670	1687.5	1650	1687.5
Lean Period										
July	1275	1400	1300	1400	1380	1400	1375	1400	1250	1400
August	1300	1400	1275	1400	1370	1400	1385	1400	1275	1400
September	1325	1400	1350	1400	1350	1400	1350	1400	1350	1400

Source: DAM (2011-2012)

Appendix 3: Monthly Average wholesale price of Maize in 2012 and 2013 (Taka/100 kg of Maize)

Month	2012	2013
January	1976	2035
February	2077	2153
March	2067	2162
April	1884	1943
May	1529	1760
June	1414	1764
July	1344	1904
August	1384	1929
September	1740	1906
October	1778	1893
November	1837	1930
December	1893	1948
Average	1744	1944

Source: BBS (2012 and 2013)