

**SUPPLY CHAIN ANALYSIS THROUGH VALUE CREATION IN
RICE MARKETING AT SOME SELECTED AREAS OF BOGRA
DISTRICT**

BY

MD. MOKSADUL MOMEN



Department of Agribusiness and Marketing
Sher-e-Bangla Agricultural University
Dhaka-1207

JUNE, 2014

**Supply chain analysis through value creation in rice marketing
at some selected areas of bogra district**

A Thesis

Submitted to

Sher-e-Bangla Agricultural University

Dhaka-1207

In Partial Fulfillment of the Requirements for the Degree of

Master of Science

In

Agribusiness and Marketing

Registration No.08-02939 Session: Jan-june-2014

Department of Agribusiness and Marketing

Sher-e-Bangla Agricultural University

Dhaka-1207

JUNE, 2014

**SUPPLY CHAIN ANALYSIS THROUGH VALUE CREATION IN
RICE MARKETING AT SOME SELECTED AREAS OF BOGRA
DISTRICT**

A Thesis

Submitted to

Sher-e-Bangla Agricultural University

Dhaka-1207

In Partial Fulfillment of the Requirements for the Degree of

Master of Science

In

Agribusiness and Marketing

Approved as to style and contents by

.....
Supervisor

Md.Ghulam Rabbany

Assistant Professor

Department of Agribusiness and Marketing

Sher-e-Bangla Agricultural University

Dhaka-1207

.....
Co-Supervisor

Sharmin Afrin

Assistant Professor

Department of Agribusiness and Marketing

Sher-e-Bangla Agricultural University

Dhaka-1207

.....
Md. Ghulam Rabbany

Assistant Professor

Chairman, Defence Committee

and

Head, Department of Agribusiness and Marketing

Sher-e-Bangla Agricultural University

Dhaka-1207

DECLARATION

I hereby do solemnity announce that the work presented in his study has been carried out me and has not been previously submitted to any other University/college/ Organization for academic qualification/certificate/ diploma or any degree.

The work I have presented does not breach any patent.

I promote assume to assure the University against any loss or damage arising from breach of the forgoing obligations.

Signature

.....

Md. MOKSADUL MOMEN

MS in Agribusiness & Marketing

Sher-e-Bangla Agricultural University

Dhaka-1207

Certificate of the supervisor

This is to certify that the thesis on “supply chain analysis through value creation in rice marketing at some selected areas of bogra district” is done by md. Moksadul momen as a partial fulfillment of requirement of “ms in agribusiness & marketing” degree from “Sher-e-Bangla Agricultural University”. This Thesis has been carried out under my supervision and this is a record of the work carried out successfully.

Signature

.....

Md. Ghulam Rabbany

Assistant Professor

Department of Agribusiness & Marketing

Sher-e-Bangla Agricultural University

Dhaka-1207.

ACKNOWLEDGEMENT

All Praises are due to almighty Allah, the Great, Gracious and Merciful, Whose blessings enabled the author to complete this research work successfully.

The author expresses his heartfelt gratitude and respect to his honourable teacher and research supervisor Md.Ghulam Rabbany, Assistant Professor, Department of Agribusiness and Marketing, Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka for his guidance, suggestion, instructions and encouragement for successful completion of the research work and preparation of this thesis.

The author expresses heartfelt gratitude and respect to his respected teacher and co-supervisor Sharmin Afrin, Assistant Professor, Department of Agribusiness and Marketing, Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka for his kind hearted cooperation, advice, constructive criticism and constant inspiration to carry out the research and preparation of this thesis.

The author also humbly desires to acknowledge his heartiest appreciation and cordial thanks to Md.Ghulam Rabbany, Assistant Professor and Chairman Department of Agribusiness and Marketing, Assistant Professor Sajeeb Shaha and all other respected teachers of Department of Agribusiness and Marketing, Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka for their cordial help and valuable suggestion during the entire study period.

The author also gives his special thanks to his friends Mahmud, Rashed, Zaman, Khairul for helping him in providing necessary research materials and encouragement and also he thanks his Brother Babu for help during data collection period.

Finally, the author owes his deep and boundless gratefulness to his parents and whole family who inspired and sacrificed a lot in the process of building his academic career which can never repaid.

The Author

ABSTRACT

This study was conducted to evaluate the value chain of rice in selected areas of Bogra district. The objectives of the study were to estimation value addition of rice by different actors, to examine the activities related to value addition and to identify the constraints, opportunities and recommendations of rice value chain. Two Upazilas namely Bogra Sadar and Kahalu were selected purposively for collecting data. To serve research objectives 10 farmers, 15 paddy traders, 10 rice millers and 10 rice traders were selected by purposive sampling. Data were collected during mid January to mid April 2014. The study found that the value chain actors were farmers, paddy traders (*Farias, Beparies*), rice millers and rice traders (*Beparies and retailers*). Value chain ongoing from harvesting paddy and finished when rice was sold to the crucial consumers. The farmers disposed their production for family consumption, gift and kind payment to relatives, seed and sold to markets. They added value of Tk. 105.0, Tk. 100.5 and Tk. 100.0 for per metric ton paddy by drying, storing and marketing respectively. Most of the farmers did not realize the value adding opportunities due to constraints such as high marketing cost due to poor transportation system, lack of market information etc. Paddy traders collected paddy from the farmers and supplied to the rice millers. The traders added value of average Tk. 1176.7/metric ton paddy. Rice millers had to incur marketing cost, milling cost and selling cost. These costs were Tk. 769, Tk. 673.8 and Tk 367.3 per metric ton paddy, respectively. Rice millers added about 23% value of which only 9% was added for total marketing and milling. Rice traders were the final value chain actors and added about 6.11% value with rice purchase price. Since, this study was done only in Bogra district, the policy makers should be very careful for any policy decisions based on the findings of this study. However, this study helps to identify the scenario in the rice value chain in Bogra district.

CONTENTS

CHAPTER	TITLE	PAGE
	ACKNOWLEDGEMENTS	i
	ABSTRACT	ii
	CONTENTS	iii
	LIST OF TABLES	vii
	LIST OF FIGURES	viii
	ACRONYMS AND ABBREVIATIONS	ix
I	INTRODUCTION	1
	1.1 Background of the Study	1
	1.2 Importance of the Study	2
	1.3 Value Chain	3
	1.3.1 Value Chain Techniques	4
	1.4 Rice Value Chain	5
	1.4.1 Functions of Value Chain Actors	7
	1.5 Justification of the Study	7
	1.7 Objective of the Study	8
	1.8 Limitation of the Study	9
II	REVIEW OF LITERATURE	11
	2.1 Introduction	11
	2.2 Supply Chain	11
	2.3 Value Chain	12
	2.4 Conclusion	15
III	METHODOLOGY OF THE STUDY	16
	3.1 Introduction	16
	3.2 Selection of the Study Area	16
	3.3 Selection of Period of Study	18

CONTENTS (Continued)

CHAPTER	TITLE	PAGE
3.4	Sample Size	18
3.5	Preparation of the Survey Schedule	19
3.6	Method of Data Collection	19
3.7	Data Collection	20
3.8	Analytical Techniques	20
3.8.1	Gross Return and Net Return of the Farmer	20
3.8.2	Margin Received by Marketing Actors	21
3.9	Processing and Analysis of Data	21
IV	VALUE ADDITION BY DIFFERENT ACTORS IN RICE MARKETING	22
4.1	Introduction	22
4.2	Marketing Channels	22
4.3	Value Chain Map of the Study Area	23
4.4	Cost and Return of Paddy Farmer and Value Addition	24
4.4.1	Cost of Production	25
4.4.1.1	Total Variable Cost	25
4.4.1.2	Total Fixed Cost	25
4.4.1.3	Gross Cost	25
4.5	Yield and Return from Paddy Farming	27
4.4.5.1	Gross Return	27
4.5.2	Gross Margin	27
4.5.3	Net Return	27
4.6	Value Addition by Farmer	28
4.7	Paddy Trader	29

CONTENTS (Continued)

CHAPTER	TITLE	PAGE
4.7.1	Marketing Cost of Traders (<i>Faria and Bepari</i>)	29
4.8	Rice Miller	31
4.8.1	Total Cost of Rice Miller	33
4.8.2	Value Addition by Rice Miller	33
4.9	Rice Trader	34
4.9.1	Total Cost of Rice Trader	36
4.9.2	Value Addition by Rice Traders (<i>Bepari</i> and retailer)	36
V	VALUE ADDITION ACTIVITIES PERFORMED BY ACTORS	37
5.1	Introduction	37
5.2	Value Addition Activities of Paddy Producers	38
5.2.1	Drying	39
5.2.2	Storing	39
5.2.3	Marketing	40
5.3	Value Addition Activities of Paddy Traders	40
5.3.1	<i>Faria</i>	40
5.3.2	<i>Bepari</i>	41
5.4	Value Addition Activities of Rice Millers	41
5.4.1	Value Addition due to Marketing Cost	41
5.4.2	Value Addition due to Milling Cost	42
5.4.3	Value Addition due to Selling Cost	43
5.4.4	Net Marketing Margin or Profit of Miller	43
5.5	Value Addition Activities of Rice Trader	43

CONTENTS (Continued)

CHAPTER	TITLE	PAGE
VI	THE CONSTRAINTS AND OPPORTUNITIES OF RICE VALUE CHAIN	44
	6.1 Introduction	44
	6.2 Constraints in Rice Value Chain	44
	6.2.1 Farmer's Constraints	44
	6.2.1.1 Production Related Constraints	45
	6.2.1.2 Value Adding Constraints	47
	6.2.2 Paddy Trader	47
	6.2.3 Rice Miller	48
	6.2.4 Rice Trader	49
	6.3 Opportunities	50
	6.4 Conclusions	51
VII	SUMMARY AND CONCLUSION	52
	7.1 Summary	52
	7.2 Conclusions	56
	7.3 Recommendation	57
	REFERENCES	59-63

LIST OF TABLES

Table	TITLE	Page
3.1	Sample Size of Different Actors	18
4.1	Cost and Return of Paddy Farmers	26
4.3	Value Addition by Farmer in Different Forms	28
4.4	Average Marketing Costs of Paddy Traders	29
4.5	Marketing Cost, Margins and Value Addition of Paddy Traders	31
4.6	Products Obtained from One Quintal Paddy	32
4.7	Costs and Margins (Value Addition) of Rice Millers	33
4.8	Value Addition from One quintal Rice by Rice Miller	34
4.9	Cost, Return, Margin and Value Addition of Rice by Rice Traders	35
5.1	Cost, Return and Value Addition of Rice by Rice Miller	42

LIST OF FIGURES

Figure	TITLE	Page
4.1	Rice marketing channels of alternatives	23
4.2	Bogra district rice value addition map	24
4.3	Comparison among various Marketing Costs	30
4.4	Products Obtained from One Quintal Paddy	32
5.1	Rice value chain map	37

ACRONYMS AND ABBREVIATIONS

BBS	Bangladesh Bureau of Statistics
DAM	Department of Agricultural Marketing
<i>et al.</i>	<i>et alia</i> (and others)
etc.	<i>et cetera</i>
i.e.	That is
MOA	Ministry of Agriculture
MS	Master of Science
m. tons	Metric Tons
No.	Number
pp.	Pages
Rs.	Indian Rupee
SSC	Secondary School Certificate
Tk.	Taka (Bangladeshi currency)
%	Percentage

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Rice is the staple food and is synonymous with food security. Rice is also a wage commodity in Bangladesh. Rice is fundamental for the nutrition of many of the people in Asia, as well as in Latin America and the Caribbean and in Africa; it is central to the food security of over half of the world population. Developing countries account for 90 percent of the total production.

(<https://en.wikipedia.org/wiki/Rice>)

Agriculture acting an important role in the overall economic presentation of Bangladesh. Agriculture contributes 16.33 % of national GDP. Moreover, the livelihood of about 77 % rural people in Bangladesh depends on agriculture. Agricultural research and development in Bangladesh has contributed enormously to assemble the food requirements of approximately 160 million populations.

Total rice production in Bangladesh was about 10.59 million tons in the year 1971 when the country's population was about 70.88 millions. However, the country is now producing about 33.2 million tons to feed about 160 million people of this country. This indicates that the expansion of rice production was much faster than the population growth. The population of Bangladesh is still growing by two millions every year and may increase by another 30 million over the next 20 years. Thus, Bangladesh will require about 42.0 million tons of rice for the year 2030.

(IFPRI, 2012)

During this time total rice area will shrink to 10.28 million hectares as because of rapid increasing population will need more land for housing. Rice yield therefore, needs to be increased from the present 2.74 t/ha to 3.74 t/ha.

(Bangladesh Rice Research Institute, <http://www.knowledgebank-brrri.org/riceinban.php>)

Moreover, political government is very anxiety about the production and price of rice in Bangladesh as their attractiveness and stability depend on the rice price due to its importance. So, in the context of Bangladesh rice plays a vital role indeed.

1.2 Significance of the Study

Agriculture is the single leading producing sector of the economy and it contributes about 16.33% to the total Gross Domestic Product (GDP) of Bangladesh. Agriculture is the main income source of 77% people who are living in rural areas. The total export value of agricultural product is 12% of total export of Bangladesh.

The general price levels of other food and non-food commodities are related to rice price. Income of farmers and their food security depends on rice price, so changes in price of rice are highly sensitive to the lower and middle classes of consumers those who live below or on the poverty level. Rice price fluctuates and changes throughout the year due to various reasons. From the beginning of production process there are a large number of value adding steps associated with rice production and marketing. The value of rice and also its bi-products i.e. broken rice, husk, bran etc. increases due to adding values at each steps of its marketing. A large portion of consumers` money spends for purchasing rice goes as extra value added by various value chain actors. If there is an inefficient value chain consumers have to pay higher prices than the prices in efficient value chain. In case of inefficient value chain the actors do not get reasonable profit margin due to extra marketing cost. Rice price is very important for all including producers, traders and ultimate consumers. Rice is considered as a political commodity. For these reasons, it is obvious that rice value chain should receive serious attention by the actors involved in rice vale chain further improvement of it. In brief, value

chain is a tool for understanding the dynamics, opportunities and constraints of promising product markets.

This study has been conducted on supply chain analysis through value creation in rice marketing which has important policy implications for farmers, traders, and the policy makers in Bangladesh.

1.3 Value Chain

The value chain concept was developed and popularized in 1985 by Michael Porter, in “Competitive Advantage,” a seminal work on the implementation of competitive strategy to achieve superior business performance.

A broad definition of value addition is to economically add value to a product and form characteristics more preferred in the market place. There are two main types of value addition. The one is innovation and the other is coordination. Innovation focuses on improving existing processes, procedures, products or services. Different economist defined value chain in different ways. Some of the definitions are given below.

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

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

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

<http://en.wikipedia.org/wiki/value> chain management

A series of value generating activities associated with product marketing from farm level to the ultimate consumer is referred to as value chain. Mainly the value chain activities of rice are carrying paddy from field after cutting, threshing, cleaning, bagging, storing, carrying to the markets, selling to the traders (e.g. *Faria*, *Bepari*), selling to the millers then millers convert paddy into rice maintaining various quality and grading. Rice millers are the starting actors in milling, bagging, transporting to different market, then rice traders do the job of selling to the ultimate consumer.

1.3.1 Value Chain Techniques

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

- I. **Mapping:** Mapping is a central element of value chain analysis, using diagrams to show the flow of transformations and transactions from sourcing raw material and inputs, to production, to further processing, to marketing and final sale. The maps can also illustrate costs, value added at each stage, secondary services (such as finance or communications infrastructure) important to each stage, critical constraints, and the relative clout of players along a value chain. In rice value chain different value adding steps, costs of production, processing costs, marketing channels, value added with paddy and rice in each stage etc. will be included into value chain maps.

- I. **Participatory approach:** Because each player along a value chain impacts the value earned, and because players performing different functions and exerting different levels of clout often have very different perspectives on critical opportunities, bottlenecks and the potential and feasibility of different interventions, value chain analysis demands the participation of the full range of stakeholders. This range includes buyers (i.e. in case of rice value chain *Faria*, *Bepari*, wholesaler, rice miller, retailer etc.), processors, producers, input suppliers, public agencies and associations that impact industry, trade, labor and commercial regulations and practices. Value chain maps diagram downstream and overseas players, interviews and strategic sessions. It also taps the range of actors along the chain. The perspective, buy in and participation of stakeholders increase the chances that the most critical bottlenecks and opportunities will be not only identified, but successfully overcome.

1.4 Rice Value Chain

The value chain of rice is the sequence of events from its production to processing, then down to its marketing and consumption. The rice input suppliers, rice producers, and the marketing channels usually compose the basic value chain processes for a rice subsector. The variety of seed is the most important input of the rice industry. Rice, the important food grain, is supplied mainly to retail markets, groceries, and to public markets to cater the consumers. The industry's value chain uses wide-ranging labor. Upon paddy production, a pre-requisite to a good and efficient marketing system is the ability of the producers to decide on the best way to store and move their products down to their market destinations.

Rice value chain concentrates on the linkages between each of the actors (rice miller, *Faria*, *Bepari*, wholesaler, retailer, and consumer) along with the value

chain, from input supplies up to the ultimate consumers including actors associated with marketing and processing. It also concentrates on a detailed breakdown of the costs, profits and margins, the key constraints and linkages at each level of the chain.

A long value chain and huge costs and margins derived by the actors are one of the main causes for its price instability. This is why it is very important to analyze the value chain of rice for identifying the value chain activities of different actors. The value chain analysis would help make appropriate marketing strategy and pricing policy of rice in the country.

Rice value can be changed by the value chain actors in different ways. Some of the ways are as follows:

- I. Storing product (Time utility change): By storing for some days, weeks or months even years to create some extra value during the crisis season of the particular product. For example farmers or traders store paddy or rice when supply is plenty in the peak season until when supply is scarce.
- II. Form change (Form utility change): By changing the form of the product and or by processing. For example, paddy change into rice and rice can be changed into cooked rice, fried rice (*Muri* in local name), flour, cake etc. Different forms of rice with the value chain actors deal are as follows:

- Paddy is non husked rice as harvested from the farmers.
- Brown rice (husked rice): Paddy from which only the external and non-edible husk has been removed. The bran layer remains, making it more nutritive than white rice. Frequently, green kernels are found with the brown rice as grain maturation is not homogeneous.
- White rice: Milled and polished kernel is produced by husking the brown layer. White rice adds higher value than other kinds of rice. It is polished two or three times more than normal rice to change the shape and remove brownish color of rice.

- Aromatic rice (naturally aromatized) has more flavor than the other varieties. Basmati rice such as *Kalizira*, *Katarivog*, *Chinigura*, *Muktamala* etc. cultivated in Bangladesh, India and Pakistan, are the best known and most appreciated. These rice varieties have naturally aroma but there is also artificially flavored rice in market. Aromatic rice generally adds highest value which is about 18%-20% than normal rice.
 - Parboiled rice: Parboiled rice is created by steeping or soaking the rice in water of 60-80 Celsius and steaming it at 100° Celsius and drying it. Parboiled rice has a harder grain. Parboiled rice is processed by the millers due to some nutritious values associated with. It adds about 8%-10% value than normal rice.
- iii. Place change (Place utility change): By moving rice from one place to another. To move product value some extra costs are added for product marketing and cost of the value chain actors.
- iv. Grading and standardization: Value can be added to a commodity by grading, sorting, cleaning, etc. Mainly grading and standardization are done to categorize product according to the size, shape, quality, texture and other attributes. Paddy and rice can be standardized by varieties, moisture content, presence of spoil rice etc.

1.4.1 Functions of Value Chain Actors

Common actors in rice value chain in Bangladesh are farmers, paddy traders (*Faria*, *Bepari*, *Aratdar*, and Wholesaler), rice millers and rice traders (*Bepari*, *Aratdar*, wholesaler, retailer). Different value chain actors have different activities but all of them add some values in every steps of marketing channel. Preceding actors add value as cost of marketing and profit. With the cost of marketing every actor add some extra value which called profit or net margin. Each actor takes the ownership of paddy and adds some value for transferring

ownership to the next actor and ultimately consumer purchase rice from the retailers.

1.5 Justification of the Study

Value chain analysis of rice is an important area for value chain research in Bangladesh. As because a considerable amount of consumers Taka goes to different value chain actors in recent few years value chain analysis received serious attention by the researchers. As a matter of fact since the existing works are not sufficient to understand the rice value chain. .

The rice market is so perfectly competitive due to various government interventions in the market and also potentially existence of some price makers in the paddy and rice marketing system. Paddy producers are mainly subsistence and semi-subsistence in nature. Most farmers sell paddy immediately after harvest for immediate cash needs. But profit margins vary in the rice value chain due to market imperfections, unequal bargaining power among different actors, and unavailability of timely market information etc. If the actors were known the benefit of participation in the value chain system actors would be benefited.

However, this study would first enlarge the volume of value chain research in Bangladesh. Findings of this research for example the efficiency or inefficiency level of value chain and the factors affecting value chain efficiency in different marketing stages will be useful for researchers, policy makers, and development practitioners and most importantly for actors in the rice value chain in Bangladesh. The research would help to formulate recommendation to reduce the marketing cost of rice, institutional constraints to solve problems in whole rice value chain. .

Value chain analysis would help understand how to improve the farmer's performance in every value adding steps. Thus this study might be of importance to the policymakers, individual farmers, consumers i.e. both macro and micro level. Moreover, this kind of study has not been conducted in any of the research

institutions or government organizations in Bangladesh. Although this study was an attempt for an academic purpose and due to lack of time, man power, and resources, small number of samples uses, this could still provide a shed for understanding the rice value chain in Bangladesh.

1.6 Objective of the Study

The present study was therefore, undertaken with the following objectives:

- i) To estimate the value addition of rice by the different actors
- ii) To examine the activities related to value addition of rice by different actors.
- iii) To identify the constraints and opportunities in rice value chain.
- iv) To suggest policy options and recommendations for improving value and supply chain of rice.

1.7 Limitation of the Study

Almost all the research works have some limitations. The study suffers from the following limitations:

- i. The first limitation of this study was the shortage of time. The primary data and other necessary information were collected within a short period of time and hence could not cover wider area.
- ii. Paddy producers did not keep proper records of their farm business. Because of illiteracy and hidden business interest no written records were maintained by the respondents (producers, and traders). As a result, the accuracy and the reliability of data mostly depend on their memories. This situation may have caused a built in limitation of the data used in the analysis.
- iii. Paddy traders, rice millers and traders had records of transaction and price in many cases but they were reluctant to disclose their records due to fear

of any adverse situation for example imposition of tax. They were reluctant to disclose the actual figures on purchase price, sales price, production, monthly sale, income, profit etc.

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

CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

The theory of this chapter is to estimate of previous studies, which are related with the present study. The review is presented and discussed below.

2.2 Supply Chain

Supply chain and value chain is slightly different thing. In fact, supply chain and value chain are two different concepts.

Fanny *et. al.* (2008) defined supply chain as the integration of internal business functions and the flow of materials and information from the point of entry into the firm until they are delivered to the end-consumer.

Some specific studies have been conducted on supply chain. These have reviewed here chronologically.

Alam (2005) identified three distinct channels in the supply chain of rice mills in Bangladesh. These are rice processing channel, imported machinery channel and rice mill equipment production channel. In the rice processing channel raw paddy from the farmers was bought by the *Aratdars* or commission agents and supplied to rice millers. Sometime the rice mill owners themselves bought raw paddy directly from the farmers through their own intermediaries. The milled rice was then sold to the wholesalers of different districts and cities, sold to consumers through retailers.

Anna (2006) stated supply chain as the art and science of managing and controlling the flow of goods, energy, information and other resources like products, services and people, from the source of production to the marketplace.

It is difficult to accomplish any marketing or manufacturing activity without supply chain network or logistic support. It involves the integration of information, transportation, inventory, warehousing, material handling and packaging. The operating responsibility of logistics is the geographical repositioning of raw materials, work in process, and finish inventories where required at the lowest cost possible.

2.3 Value chain

Porter, (1985) defined value chain is a chain of activities. Products pass through all activities of the chain in order and at each activity the product gains some value.

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

Kapur (2003) identified value addition of raw rice (Grade-A) milling unit as process cost which includes Rs. 69.6 per quintal (12%) for taxes and levies, cleaning, loading and miscellaneous costs (Vat-4%, *Arat*-2.5%, market fee-2%, process fee 2%, miscellaneous-1.5%), Rs. 9 per quintal for drying, Rs.20 per quintal for de-husking and polishing, Rs. 2 per quintal for grading. After grading

yield of raw rice @ 67% accumulated value becomes Rs. 1015.8. Cost of rice bran (7%) at 500 per quintal. Cost of rice husk (19%) at Rs. 100 per quintal. was Rs.19 . Overall gross profit was Rs. 79.2 per quintal. The author also found that percentage of gross profit on sale in respect of rice as 7.5% for raw rice and 6.2% for parboiled rice. In view of the quantum of work load given by purchasing agencies this profit margin appears to be rational. *Grade A (Basmati rice and superfine quality). (*Here exchange rate of Rupee (and Bangladeshi Taka was 1 Rupee= 1.49 Taka)

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

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

Stryker (2008) concluded that major advances were made in rice competitiveness through liberalization of rice marketing and milling. This led to the introduction of small rice hullers, which were able to process rice relatively inexpensively compared with larger mills. There were also substantial savings in the cost of transporting paddy and the value for animal feed of the hulling byproducts. However, with rice prices having risen on world markets and with advances in milling technology, it is time to revisit this question. The imported rice with which domestic production competes is of a quality standard not met by most small hullers, resulting in price discounts and lost profits. Evidence from Rwanda and a few other countries suggests that milling technology currently exists that allows

for upgrading of quality without necessarily losing the advantages of operating on a relatively small scale. Better milling should take care of the problems of impurities, lack of uniformity, and high percentage of broken grains.

Complementary investment in storage should also ensure that adequate supplies of local rice are available year round. This will not necessarily solve problems of taste, storability, cooking time, water absorption and other characteristics that are not apparent to the eye.

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

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

2.4 Conclusion

Value chain of rice is very important in the context of Bangladesh. Till now sufficient research study had not been conducted in this research area. So, very wide and thoroughly research works are directly needed for providing information for the strategy makers so that enhanced policies can be formulated.

CHAPTER III

METHODOLOGY OF THE STUDY

3.1 Introduction

This chapter presents a detail methodology adopted in this study which includes the selection of study area, selection of sample, preparation of survey schedule, data collection method, period of survey, editing and tabulation of data and analytical techniques to be used. These are discussed below.

3.2 Study Period

The area of the study was Bogra district. Two specific upazilas, namely, Bogra Sadar and Kahalu are chosen for this study.

The reasons for selecting the Bogra district for the present study are as follows:

- i. Bogra is one of the broadly rice producing district of the country.
- ii. The researcher was familiar with the local farming, local culture, belief and other characteristics of the area.
- iii. Rice mills were available mainly in the two upazilas selected and also produce about 40%-45% of paddy of total production in Bogra district because these two upazilas cover about 40% of the land area of the district.
- iv. No such study was conducted earlier in this area. So value chain analysis of rice was a new study conducted in the research areas.

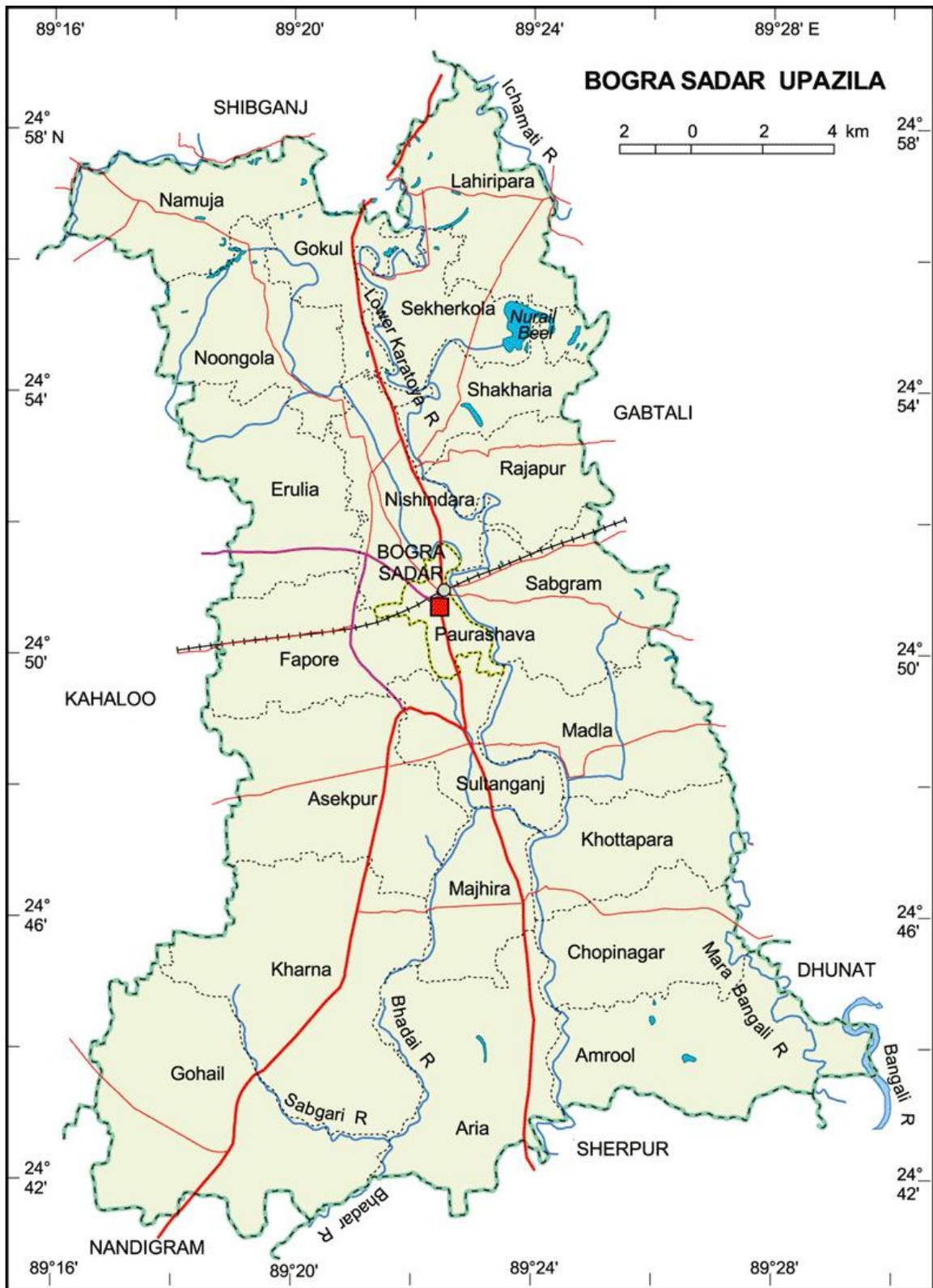


Fig 3.1.: Study Area (Bogra Sadar and Kahalu Upazila of Bogra District)

3.3 Selection of Period of Study

The present study cover four months period that started from January, 2014 to April, 2014. Data were collected during the period from February, 2014 to April, 2014 through direct interviews with farmers, paddy traders, rice millers and rice traders using a structured survey schedule. For collecting supplementary data such as cost and return from paddy, cost of marketing, cost of transportation, cost of milling, cost of selling, transportation system etc. The researcher personally visited the area several times.

Data were collected on the production of Aman season which was already harvested. Due to some limitations such as time constraints, shortage of fund and workers, only Aman season was selected for the study.

3.4 Sample Size

Farmer, paddy traders, rice millers and rice traders of Bogra Sadar and Kahalu Upazila were considered as the population of the study. Considering the limitations such as time and resources, it was not possible to include all the farmers, traders and millers. So, the sample included 10 farmers and 35 other value chain actors (15 paddy traders, 10 rice millers and 10 rice traders). Farmers and other value chain actors were not classified into any specific categories based on age, education, and size of activity due to researcher's limitations and possibility of increasing the dimensions of the present study which are beyond the scope. Sample size has been shown in table 3.1.

Table 3.1 Sample Size of Different Actors

Value chain actors	Sample size
Farmer	10

Paddy trader (<i>Faria, Bepari, Aratdar</i>)	15
Rice miller	10
Rice trader	10

3.5 Preparation of the Survey Schedule

In order to collect data, keeping the research objectives in mind, the interview schedules were prepared. Different interview schedules were prepared for different actors. There prepared 10 schedules for farmers, 15 for paddy trader, 10 for rice millers and 10 for rice traders and total number of schedules was 45. Farmer's interview included questions related to various aspects of production, marketing and various value adding activities at farm level.

Trader's schedule included questions related to volume of sales, place of sales, price and the marketing cost and various value adding activities.

Miller's survey schedule included the cost structure of paddy collection, milling costs, disposal cost of finished products (i.e. rice, bran, husk, broken rice) etc.

Rice traders' survey schedule included cost of rice collection, operating costs of business, sales cost, price of rice etc. During pre-testing of the survey schedules, attention was paid to include of any aspect which was not included in the draft schedule and to exclude which was not redundant. Thus, the draft schedules were rearranged and modified in the light of the actual and practical experiences gained during pre-testing of the survey schedules. Later, the survey schedule was finalized and printed out.

3.6 Method of Data Collection

The researcher himself collected the data through face to face interview. Before starting actual interviews the purpose of the research was clearly explained to the sample farmers, traders and consumers. Initially, they hesitated to answer the questions but when they were assured that the study was an academic research, so it would not affect them adversely in any way, they fully cooperated in giving information.

During interview, the researcher asked questions thoroughly and explained the questions when it was felt essential. Farmers were used to afford accurate data as far as possible. If there were such items, which were overlooked or ambiguous, were corrected by another interview. In order to minimize the errors, the quantitative data were collected in local units but later on they were converted into standard units.

In addition to primary data, secondary data such as country's agricultural production, farm family related data e.g. number of family members, farmer's educational status, farm size of the farmers etc. were also collected from various secondary sources such as books, journals, newspapers, different organizations and webs.

Most of the respondents did not keep written record of their farm and business activities.

3.8 Analytical Techniques

Data were analyzed with the purpose of achieving the objectives of the study.

The following techniques were used to analyze data in the present study:

3.8.1 Gross Return and Net Return of the Farmers

- **Gross return** was calculated by multiplying the total volume of output of an enterprise by the average price of the product. It consisted of sum of the volume of main product and by product.

The following equation was used to estimate gross return was:

$$GR = \sum Q_p \cdot P_p + \sum Q_s \cdot P_s$$

where,

GR = Gross return from paddy/rice (Tk./acre)

Q_p = Quantity of paddy (quintal/acre)

P_p = Average price of paddy (Tk./quintal)

Q_s = Quantity of straw (quintal/acre)

P_s = Average price of straw (Tk./quintal)

- **Net Return** was calculated by deducting all costs (variable and fixed) from gross return.

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

Here, π = Net return (profit)

3.8.2 Margin Received by Marketing Actors

Marketing margin is the difference between the producer and consumer prices.

Marketing margins and net margins of different intermediaries were estimated by using the following formula:

Market margins

- Gross marketing margin (Tk./quintal) = Sale price (Tk./quintal) - Purchase price (Tk./quintal)
- Net margin (Tk./quintal) = Gross margin (Tk./Quintal) - Marketing cost (Tk./quintal)

- Value addition (%) = $\frac{\text{Marketing margin}}{\text{Purchase price}} \times 100$

3.9 Processing and Analysis of Data

The filled up interview schedules were scrutinized and edited in order to eradicate any ambiguities and inconsistency of collected data. The collected data were then transferred to Excel-sheets, compiled and summarized. Qualitative data were converted into quantitative ones by means of appropriate scoring. A list of tables was prepared in accordance with the objectives of the study. Mainly descriptive statistics were applied for the analysis of data to obtain the results.

CHAPTER IV

VALUE ADDITION BY SPECIAL ACTORS IN RICE MARKETING

4.1 Introduction

Value additions are mostly concerned with the changes of utilities. In economics, the sum of the unit profit, the unit depreciation cost, and the unit labor cost is the unit value.

In the context of macroeconomics, it refers to the input of the factors of production, i.e. land, labor, and capital goods, to raising the value of a product and corresponds to the incomes received by the owners of these factors. The national value added is shared between capital and labor (as the factors of production), and this sharing gives rise to issues of distribution. Value added refers to the additional value of a commodity over the cost of commodities used to produce it from the previous stage of production. The value added to any product or service is the result of a particular process.

Hence this chapter is concerned with the estimation and analysis of costs, returns and value addition of rice in different value adding stages by farmers, traders, rice millers and rice traders.

4.2 Marketing Channels

The study has identified different marketing channels of paddy, rice and associated by-products. Two different marketing channels were found most in the study areas. First, paddy marketing channel which was - paddy producers (farmers) to rice millers. Second, rice marketing channel was - millers to ultimate consumers. Actors in paddy marketing channels included *Farias*, *Beparies* and Rice millers and actors in rice marketing channel included rice miller, *Bepari* or wholesaler and retailer.

Various types of marketing channels are shown in the fig: 4.1. About 50% paddy and rice were marketed by identified second and third marketing channels out of seven channels shown in fig. 4.1. Mainly *Faria* and *Bepari* were common actors in the study areas.

All the channels identified are shown below:

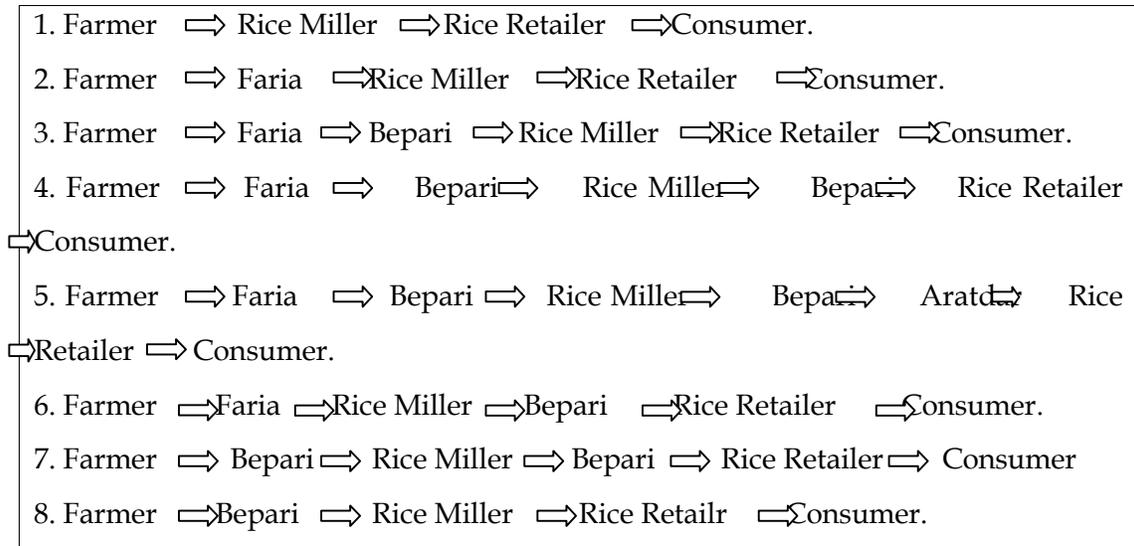


Fig 4.1.: Rice Marketing Channels of Alternatives

4.3 Value Chain Map of the Study Area

Paddy traders collected paddy from local farmers of Bogra Sadar and Kahalu upazila and supplied it to the rice millers located in the same upazilas. Major part of paddy was assembled for selling in local markets such as Matidali , Kahalu, Gokul and Ghoradhap etc. On top of that some large rice millers were found who collected paddy from Dinajpur, Rangpur, Naogaon, Natore etc.

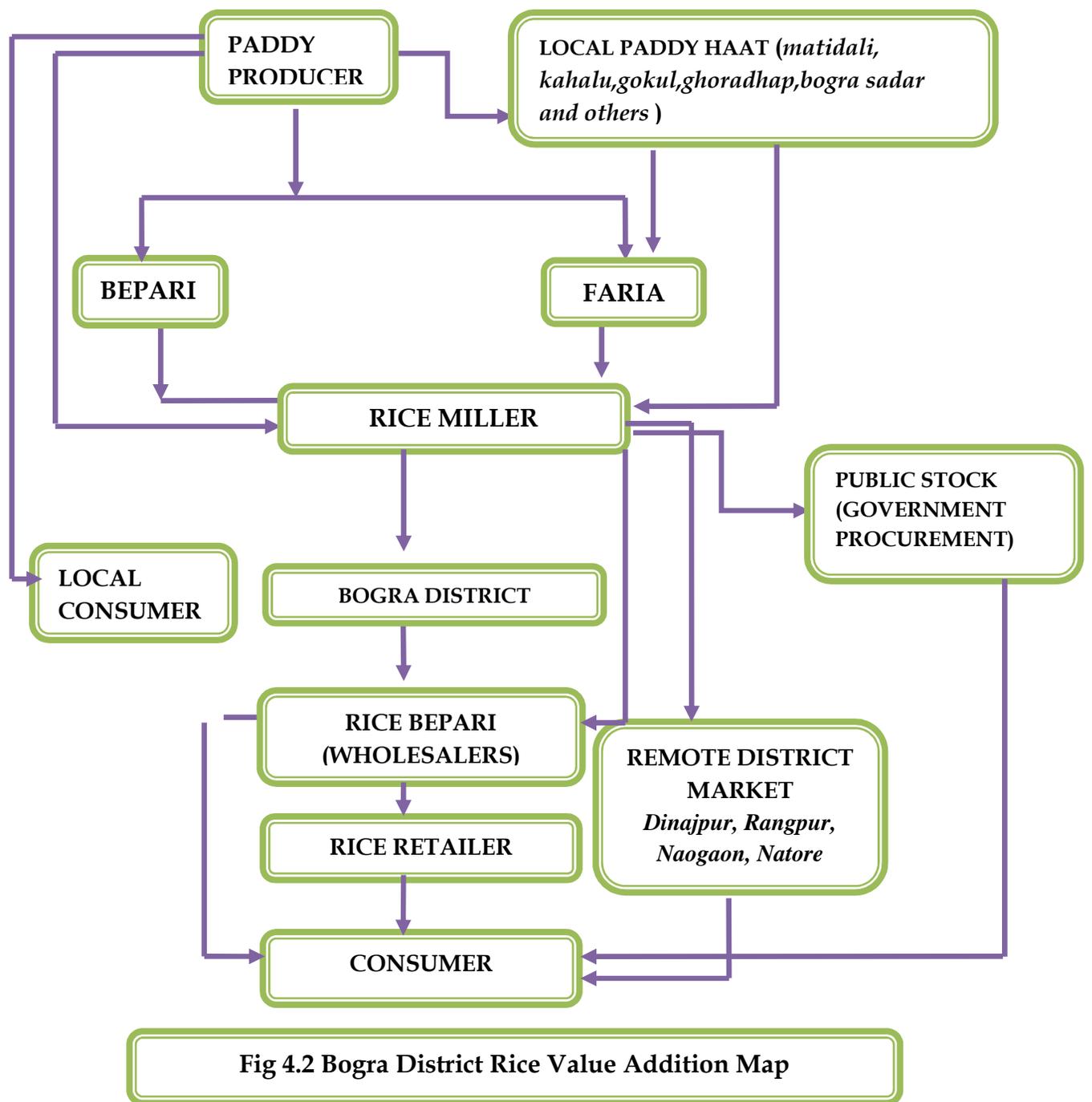


Fig 4.2 Bogra District Rice Value Addition Map

4.4 Costs and Return of Farmers and Value Addition

Costs, returns and value addition of special value adding actors were estimated individually. Main cost items were production cost, marketing cost, processing cost, miscellaneous cost etc. Returns were calculated by multiplying the total output with per unit price of products and by products. Value addition was simply the difference between the prices of value adding steps.

4.4.1 Cost of Production

All the costs items related to paddy production constituted the costs of production. Production costs were mainly of two types i.e. variable costs and fixed costs.

4.4.1.1 Total Variable Cost

For One Acre Land: Sum of the costs of variable inputs for cultivation of one acre land made total variable costs, which was Tk. 21250.00 (Tables 4.1). Total variable costs were 75.22% of total costs. Labor cost constituted the highest and the cost was about Tk. 14850.00 which was 48.89% of total cost.

Labor cost was very high due to unavailability and seasonality of labor. Generally small farmers used family labor to reduce the cost of hired labor. In calculating labor costs-farmer's family labors were considered. But small and marginal farmers could save about 30-40% labor cost by using family labor in rice production.

4.4.1.2 Total Fixed Cost

Fixed cost is the cost which is permanent in nature and last longer. Fixed costs are those, which do not change and are incurred even when there is no production activity. Fixed cost includes the rental value of land and interest on operating capital. The study found that the rental value land was on an average Tk. 7000.00 per acre of land. Interest on operating capital was 10% depending on types of lending authority.

4.4.1.3 Gross Cost

Gross cost was the sum of total variable cost and total fixed cost. Gross cost was Tk. 30375 for one acre land and it was Tk. 1320.65 for producing one quintal paddy.

Table 4.1: Costs and Returns of Paddy Farmers

	Particulars	Quantity (unit)	Price per unit (Tk.)	Total value (Tk./hec.)	Cost or Return (Tk./quintal)	% of total cost or return
Variable costs	(i) Human labour (Man-day)	55	270	14850	645.65	48.89
	(ii) Land preparation (Power tiller or draft power)	2 times	1000	2000	86.96	6.58
	(iii) Seed/seedlings (Kg)	30	30	900	39.13	2.96
	(iv) Fertilizer and insecticide	-	-	2000	86.96	6.58
	(v) Irrigation	-	-	1500	65.22	4.94
	(vi) Total variable costs (TVC)	-	-	21250	923.91	69.96
Fixed costs	(vii) Rental value of land	-	-	7000	304.35	23.05
	(viii) Interest on Operating Capital	-	10% of total variable cost	2125	92.39	7.00
	(ix) Total fixed cost (TFC)	-	-	9125	396.74	30.04
	(x) Gross cost (GC=TVC+TFC)	-	-	30375	1320.65	100.00
Return and margin	(xi) Paddy (quintal)	23	1400	32200	1400.00	-
	(xii) Straw (1 aati = 3kg)	1440	3	4320	-	-
	(xiii = xi + xii) Gross return (GR)	-	-	36520	-	-
	(xiv = xiii - vi) Gross margin (GM)	-	-	15270	-	-

	Net margin (xv = xiii - x)	-	-	6145	-	-

(Here, 1 acre= 100 decimals, 2.47 acre= 1 hectare and 1 quintal= 100 kg.)

Source: Field Survey, 2014

4.5 Yield and Return from Paddy Farming

Paddy farming is still at subsistence level in the study area. Farmers who produce paddy as tenant can hardly cover their cost of production. Considering some exceptional cases the study found that farmers were not getting satisfactory return. But large farmers mentioned that they got good return as they were acquainted with modern farming. Small farmers could appoint extra family labor but other technological supports were not available for them. As a result they could not manage good return as the large farmers. They thought they only receive the reward for their personal and family labor. Total return is calculated by multiplying the average price per unit (quintal) paddy and total yield. It was calculated by adding the total return from paddy and straw (bi-product). If paddy was only considered there was no profit at all.

Generally it was found that about 20 quintal paddy and about 43 quintal straw were obtained from one acre land. Most of the farmers were not acquainted with modern technology. They did not use optimum doses of fertilizer or other intercultural operations. Therefore, the outputs of the farmers were not satisfactory.

4.5.1 Gross Return

Gross return was calculated by multiplying the total amount by average sales price. Gross return of one acre land from paddy and straw was Tk. 36,520. Gross return was the sum of return from paddy and straw where return from paddy was Tk. 32,200 per acre and return from straw was Tk. 4,320 per acre.

4.5.2 Gross Margin

Gross margin is the gross return over variable cost. Gross margin was obtained by deducting total variable cost from gross return. Table 4.1 shows that gross margin of one acre land was Tk. 15,270 and gross margin was Tk. 6,145 per quintal.

4.5.3 Net Return (profit)

Net return (profit) was calculated by subtracting total cost of production from gross return. Table 4.1 shows that the net margin or profit of one acre land by producing paddy was Tk. 6145. Average net return was very small indicating that the farmers can hardly cover their cost of production and got a small return.

4.6 Value Addition by Farmer

The input costs were high in one hand and both the yield and output prices were not sufficient on the other. Small farmers could not store paddy but large farmers added extra value with paddy by storing for average of three months. Some large farmers generally added about Tk 100.50 per quintal paddy by storing for few months in the study area.

Table 4.3: Value Addition by Farmer in Different Forms

Items	Price	Value addition (TK/quintal)	Value addition (%)
Value addition due to drying	Wet paddy Price	1317.50	-
	Dry paddy price	1422.50	-
	Drying cost	47.50	-
	Marketing margin (value addition)	105.00	7.97
	Net marketing margin	57.50	-
Value addition due to marketing	Farm gate price of paddy	1310.00	-
	Market price of paddy	1410.00	-
	Marketing cost	52.25	-
	Marketing margin (value addition)	100.00	7.64
	Net marketing margin	47.50	-

Value addition due to storing paddy	Price before storing paddy	1447.50	-
	Price after storing (average 3 months)	1548.00	-
	Storing and marketing cost	65.25	-
	Marketing margin (value addition)	100.50	6.94
	Net marketing margin	35.25	-

Source: Field Survey, 2014

It was found that most of the farmers were not aware about the benefits of value chain. The matter of fact that they were engaged with some traditional value adding activities e.g. drying, cleaning, storing etc. But they had no idea about modern value chain activities. The transportation and infrastructure was not developed. Therefore, paddy marketing by the farmers was expensive and in some cases it was not beneficial at all when the farmers sold in small amount. Moreover, market information system was not adequate for the farmers to receive extra benefit through various value chain activities. Mostly practiced value chain activities have shown in the Table 4.3 with value addition in different forms.

4.7 Paddy Trader

Paddy traders are the second value chain actors in the rice value chain. In Bogra Sadar and Kahalu upazilas of Bogra district, there were two types of paddy traders such as *Faria* and *Bepari*.

4.7.1 Marketing Cost of Traders (*Faria and Bepari*)

Different marketing costs items along with share of paddy traders are shown in the table 4.4. Average cost was calculated for paddy traders (*Faria and Bepari*).

Table 4.4: Average Marketing Costs of Paddy Traders

Cost Items	Tk. /quintal	Tk. /kg	% of total cost
Transportation	23.75	0.24	44.79
Loading and unloading	9.75	0.01	18.39

Bag/Sack, Sewing	1.425	0.01	2.69
Market toll	6.625	0.07	12.49
Weighing	3.25	0.03	6.13
Personal expenses	3.13	0.03	5.89
Un-official cost	0.975	0.01	1.84
Rent for shop	1.93	0.02	3.63
Interest for borrowed money	4.11	0.04	7.76
Total marketing cost	53.03	0.53	100

Source: Field Survey, 2014

Table 4.4 showing that the transportation cost of the paddy traders was heights and it was Tk. 23.75 and 44.79% of total marketing costs. On an average for moving 1 quintal paddy within a distance of about 1 kilometer Tk. 23.75 was very high compared to other regions of the country.

It was seen that average purchasing price of paddy was Tk. 1425.00 per quintal and average selling price of paddy was Tk. 1510.83 per quintal. Average value addition by the paddy traders was only Tk. 85.83 per quintal which is 6.03% of total.

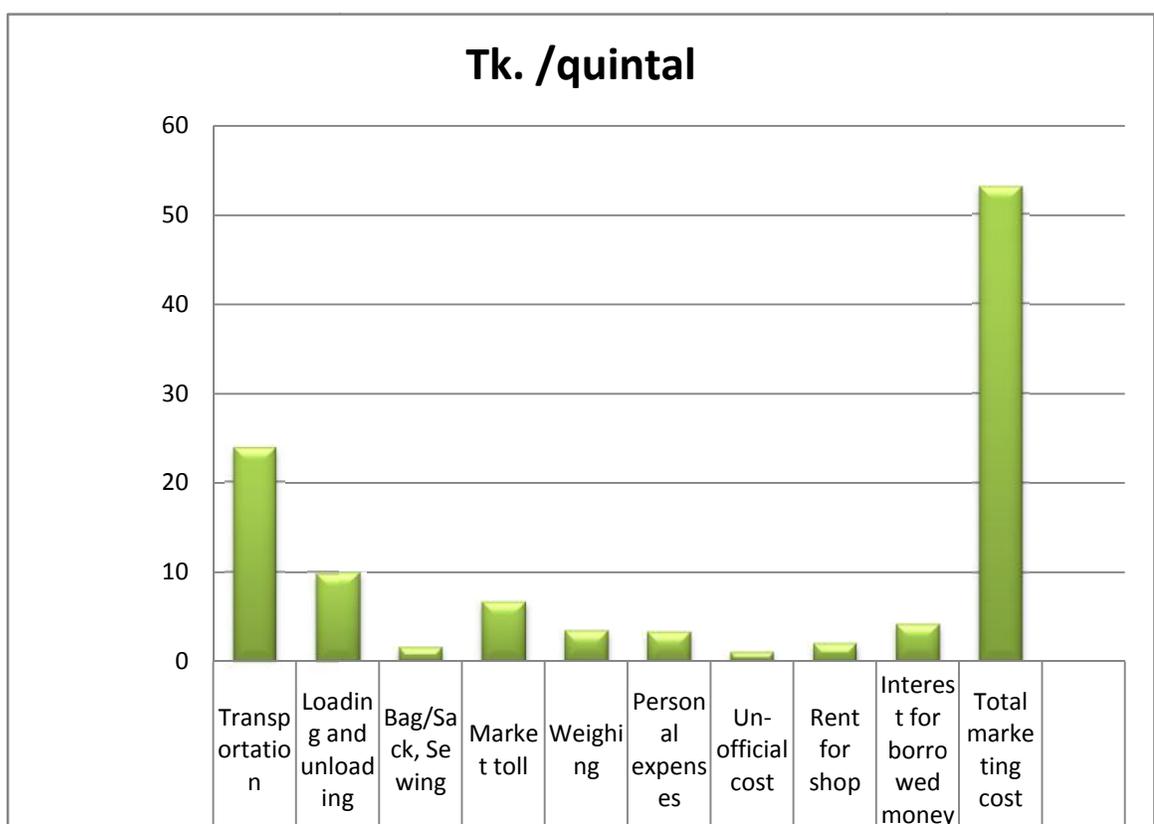


Fig 4.3: Comparison among various marketing costs

In table 4.5 it has shown that the total marketing cost of paddy was 56.99 Tk. per quintal which was about 57.0% of marketing margin (MM) or value addition. Among the variable costs, transportation cost was the highest and the cost was about Tk. 23.75 per quintal. Total variable cost and fixed cost was Tk. 48.91 (92.24% of total cost), Tk. 4.11 (7.76% of total cost), respectively

Table 4.5: Marketing costs, margins and value addition of paddy traders

Items		(Tk. /quintal)	% of marketing margin
Purchase price of paddy		1425.00	-
Sells price of paddy		1510.83	-
Marketing cost	Variable cost	48.91	56.99
	Fixed cost	4.12	4.79
	Total	53.03	61.78
Value addition (marketing margin)		85.83	100.00
Gross margin		36.92	43.01
Net margin		32.81	38.23

Source: Field Survey, 2014

4.8 Rice Millers

Rice miller added value in three different steps i.e. marketing of paddy, milling of paddy and selling of rice. Rice milling system is not developed in the study area. Most of the rice mills in the study areas were husking mills except some large

semi-automatic mills. Table 4.7 showing that rice millers could add value of total Tk. 313.78 for purchasing, conversion of rice and rice marketing. They added 23.23% extra value for their whole activities. Value addition was calculated based on 1 quintal paddy and final selling price was calculated summing up the selling price of products produced from conversion of 1 quintal paddy i.e. rice, bran, husk and broken rice.

Table 4.6 Products obtained from one quintal paddy

Products	Amount(Kg)	% of total	Per unit price	Total value
Rice	66.54	66.54	26.71	1777.2834
Bran	6.33	6.33	15.24	96.4692
Husk	22.06	22.06	2.12	46.7672
Broken rice	4.08	4.08	17.60	71.808
Weight loss	0.99	0.99	-	19.50
Total	100.00	100.00	-	-

Source: Field Survey, 2014



Fig 4.4: Products obtained from one quintal paddy

No automatic mills were found in the study area. Most of the rice millers were not economically sound to realize the full benefit of value chain. There were some other problems faced by the millers e.g. lack of electricity, unavailability of paddy through the year round, bad transportation system with bad road and infrastructure and the poor marketing system.

4.8.1 Total Cost of Rice Miller

Various costs items return and value addition has been shown in table 4.7. The cost of rice miller has classified into three broad categories i.e. purchasing cost of paddy, milling cost of paddy and selling cost of rice. Among these three-marketing cost of paddy was the largest and was about Tk. 76.95 per quintal which was 24.52% of total cost. Total milling cost was Tk. 67.38 per quintal of which total variable cost was Tk. 51.88 per quintal and total fixed cost was Tk. 15.15 per quintal. Milling cost was 21.47% of total cost. Total selling cost of rice was Tk. 36.73 per quintal which was 11.71% of total cost.

4.8.2 Value Addition by Rice Miller

Rice millers are the highest value adding actors in the rice value chain. On average rice millers add value of about Tk. 313.78 per quintal paddy. The value adding

items and the amounts of value adding are shown in Table 4.6 below. **Table 4.7 Costs and Margins (Value Addition) of Rice Millers**

Items		Tk. /quintal		Percent of total Value Added (%)
(i) Purchasing cost of paddy	Variable cost	51.88	76.94	24.52
	Fixed cost	15.15		
(ii) Milling cost of paddy		67.38		21.47
(iii) Selling cost of rice		36.73		11.71
(iv)= (i)+(ii)+(iii) Gross cost		181.05		-
(v) Purchase price of paddy		1659.93		-
(vi) Return from paddy		1992.28		-
(vii) Weight loss		19.50		-
(viii)= (vi)-(vii) Total return excluding losses		1972.78		-
(ix) Net marketing margin		132.73		14.54
(x)= (iv)+(ix) Marketing margin (value addition)		313.78		23.23

(* NB: Here return from one quintal paddy was calculated by adding all the selling of products and bi-products obtained from paddy i.e. rice, bran, husk and broken rice. Here weight loss was deducted from total return.)

To obtain one quintal rice, millers used about 1.51quintal paddy which added about Tk. 366.83 (table 4.8).

Table 4.8 Value Addition from One Quintal Rice by Rice Miller

Items	Amount (Tk)	Total value (Tk)
(ii) Required amount of paddy	150.28	2379.00
(i) Obtained rice	100.00	2745.83
(iii)= (i) -(ii) Value addition (Tk.)	366.83	
Value addition (%)	15.414	

Source: Field Survey, 2014

4.9 Rice Trader

Only *Beparies* and retailers were available in the study areas. Sometimes *Beparies* worked as retailers. In other areas of the country it was seen that rice millers sold rice through *Aratdar* and or *Bepari*. But in the study areas rice millers sold rice directly to the *Bepari* and retailer. Cost, return, marketing margin and value addition have shown in table 4.9.

Table 4.9 Cost, Return, Margin and Value Addition of Rice by Rice Traders

	Items	Tk. /Quintal
Marketing cost	Transportation	21
	Loading and unloading	10.68
	Bag/Sac	9.88
	Market toll (Security charge)	1.43
	Weighing	4.03
	Personal expenses	1.43
	Rent for shop	2.22
	Un-official cost	2.44
	Electricity	3.65
Total cost	Total variable cost	47.75
	Total fixed cost	8.10
	Total marketing cost	55.84
Margin	Purchasing price of rice	2710.42
	Selling price	2875.83
	Marketing margin (value addition)	165.42
	Value addition %	15.27
	Gross margin	117.67

	Net marketing margin	109.58
--	----------------------	--------

Source: Field Survey, 2014

4.9.1 Total Cost of Rice Trader

Transportation cost of rice was the highest cost for all types of rice traders. The average transportation cost was Tk. 21 per quintal. Total marketing cost of rice was Tk. 55.84 per quintal. Costs and returns were shown as average costs of *Beparies* and retailers.

4.9.2 Value Addition by Rice Traders (*Bepari* and retailer)

Value addition, the cost and return pattern of rice traders are presented in table 4.9. Rice traders have limited opportunity to add value among all other value adding actors. They could add about Tk. 165.42 per quintal extra value with rice price. Purchasing price of rice was on an average Tk. 2710.42 per quintal and selling price was Tk. 2875.82 per quintal. Net margin or profit of rice trader was Tk. 109.58 per quintal and the profit was Tk. 1.1 per kg rice.

CHAPTER V

VALUE ADDITION ACTIVITIES PERFORMED BY ACTORS

5.1 Introduction

Extensive and unproductive value chain directly influences the rice price. In the existent worlds location rice price was very high compared to paddy price. Analyzing the whole value chain of rice it was establish that rice price was not reliable with paddy price what farmers really received. Farmers got moderately lower price of paddy. Farmers could not supervise expected paddy price due to low price of paddy in the harvesting season contrary rice price was more or less stable but high. Rice value chain obtainable below shows the value adding activities by different actors. The total value chain map and activities are shown in figure 5.1 below.

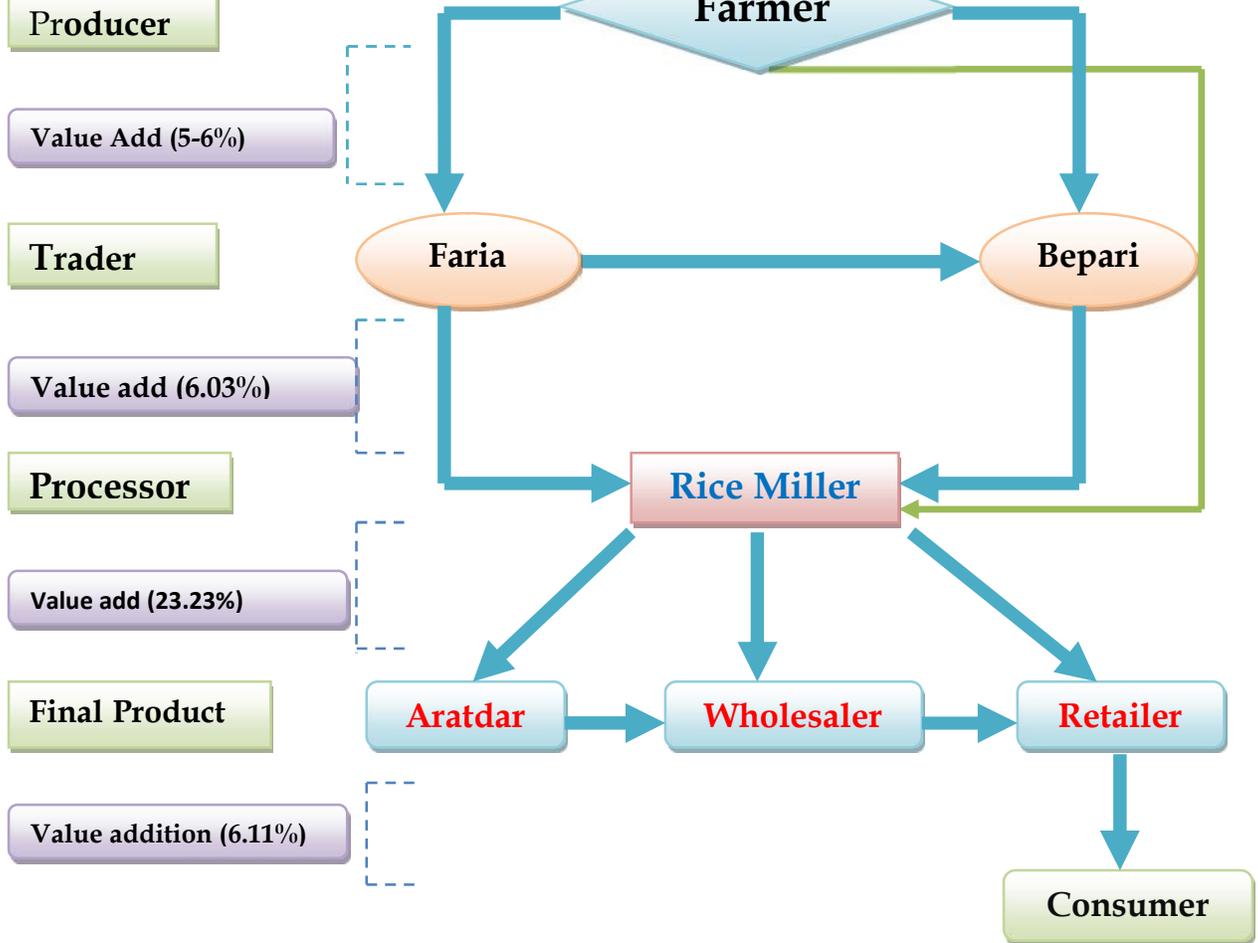


Fig 5.1.: Rice Value addition Chain Map

5.2 Value Addition Activities of Farmers

Farmers were the primary performer of value chain in rice marketing. It was found that the paddy producers could scarcely cover total cost of paddy production.

Farmers enthusiastic off paddy in four different ways. They were as follows:

- a) Kept as seed for next farming season (farmers keep about 18 kilograms of seed for cultivating 1 acre of land in next farming season),
- b) About 70% of paddy is sold,
- c) Paid off debts in kind, and
- d) Reserved paddy for household utilization.

Most of the farmers preferred to trade paddy regularly, depending on how much money they needed at the time of harvesting. Due to urgent cash needs they could not store paddy.

<http://www.encyclopedia2.thefreedictionary.com/valueaddition>.

In this study, only Aman price of the crop year 2014 was considered. Because of time and resource constraints researcher did not consider all paddy season. Only BR11 variety of paddy was considered. Value adding activities of paddy have observed in three different ways. These are as follows:

- i. Value addition by drying paddy was 7.97%.
- ii. Value addition by storing paddy was 7.64%. Average storing duration was three months.
- iii. Value addition by marketing paddy was 3.05%.

5.2.1 Drying

In the rice supply chain the logistic workings are recognized. These are drying, transporting, milling, packaging, storage etc. An essential function that needed to be performed before milling paddy was drying. The most popular method used especially, during the dry season was sun drying in concrete pavements which took place in farmyard and even some times in roads and highways. Sundrying method had problems of mixing foreign materials and no uniformity of moisture content. Financial constraints led the farmers to make use of such method. In this case, farmer incurred costs about Tk 19.87 per quintal. But when farmers used the mechanic drying method the cost could have much more than sun drying method. Moreover, the mechanical dryers were not available everywhere in the study areas. It was found that for drying total paddy from one acre, the farmers had to use one labour and in doing this the cost was Tk. 49.72 per quintal.

5.2.2 Storing

Exceptionally little farmers had the ability to accumulate their paddy for more than a month because they were in need of urgent cash to pay their exceptional credits. It was found that, sometimes part time paddy traders and large farmers were stored 10-15% of their production but for comparatively a shorter time for two or three months. It was experimental that storing paddy was not gainful because paddy price was not increased with the farmer`s expected levels. Farmers generally used traditional method to store paddy. They stored paddy in sack/bag. Some farmers used box (Berr/Gola/Dole in local name).

Average duration of storing paddy was three months. Standard value addition by storing was calculated by subtracting market price in the time of distorting and price of the storing month (generally harvesting season). Storing cost was the sum of cost of storing for three months and the associated marketing cost. It was found that cost of storing was Tk 65.25/quintal and value addition was Tk 45.28/quintal which was

3.05% of farm gate price.

5.2.3 Marketing

Marketing was an significant period of value addition. Marketing costs included transportation cost, loading and unloading cost, market toll, weighing cost, sweeping cost in the Haat (weekly market), personal expenses of the sellers, unofficial cost like tips, donation etc. Value addition was calculated by subtracting farm gate price from market price. Average value addition from paddy marketing was Tk. 100/quintal which was 7.64% more than the price in the time of storing.

5.3 Value Addition Activities by Paddy Traders

Paddy traders are the second value chain actors in the rice value chain. There were two types of paddy traders were found in the study area such as *Faria* and *Bepari* (wholesaler).

5.3.1 *Faria*

Faria was the primary value chain performer. Number of *Faria* was very large. *Farias* collected paddy from the farmers at farm gate, sometime they collected paddy from local markets and sold to *Beparies* and rice millers. Generally *Farias* have small amount of capital around TK 50,000- 2, 00,000 to run their business.

Farias did not lend money because of high interest rate and complexity of getting bank`s loan. Some *Farias* have taken loan from BRAC bank, Grameen bank, Janata bank and Sonali bank. Interest rate was about 16.0-17.0%. Among these, the Grameen bank charged highest interest rate and was found to be at 22.0 - 25.0%. Monthly average paddy transaction of *Farias* was about 570 quintal on an average.

Average distance covered by the *Faria* for collecting and selling paddy was about 12 km on an average. *Farias* of Bogra Sadar Upazila purchased paddy from Sadar, Matidali, Ghoradhap, Gokul, of Bogra Sadar Upazilla, Kahalu Market, Shibganj,

Mohasthan Haat of Shibganj Upazilla and Baghopara hat, Namuja Haat of Shibganj Upazilla. *Farias* added about 7.0-8.0% value on their purchased paddy. *Farias*, sometimes, added value without incurring any marketing cost. They worked as middleman to transfer the ownership of the product. Most of the time *Farias* completed their buying and selling at a Haat in the same day. Their net margin varied from 10.0%-15.0% more than the *Beparis*.

5.3.2 *Bepari*

Beparies were the next actor after *Farias*. *Beparies* were the final trader to transfer paddy to the rice miller. They collected paddy from *Farias* and large farmers in the local markets and sold to the rice millers. Their average working capital was about Tk. 4,50,000 and monthly average transaction of paddy was about 100 quintal. The sources of capital of *Beparies* were same as *Faria*. But they have taken more loan than *Farias* and they got the facility of taking CC (Cash Credit) loan from the banks. Generally for large amount of credit, they took loan from Sonali, Agrani, Janata etc. banks. *Farias* added about 5-6% value with the paddy they purchased from the producers.

There were no *Aratdars* in the study areas. The main reason was the volume of paddy transaction which was not large. Second plausible reason was the type of the rice mills.

Value Addition Activities of Rice Millers

Rice miller is the third actor in rice value chain. Rice millers performed the most important activities in the rice value chain. They were mainly the processor of paddy, converting paddy to milled rice.

5.4.1 Value Addition due to Marketing Cost

Rice millers purchased paddy from the farmers, *Farias*, *Beparies* and also from the commission agents (*Aratdars*). The main marketing most items were the cost

of transportation, charges paid during paddy transport, loading and unloading, market toll, cost of sack/bag, mobile bills, personal expenses, unofficial costs (like donation, tips), etc. Total marketing cost was Tk 30.78/quintal and was 18.79% of total cost and added 4.63% value to the paddy price. Transportation cost was the highest cost. Average transportation cost of rice millers was found about Tk 15.83/quintal.

5.4.2 Value Addition due to Milling Cost

Milling cost includes cost of paddy unloading, cleaning and drying, boiling, parboiling, husking paddy into rice, bran, husk and broken rice, bagging, etc. After milling paddy rice was gotten as main product. Bran, husk and broken rice were obtained as byproducts. Milling cost was found to be Tk 26.184/quintal.

Table 5.1: Cost, Return and Value Addition of Rice by Rice Miller

Items	Tk./quintal	Tk./kg	Value addition (%)
(i) Marketing cost	76.94	0.77	4.64
(ii) Milling cost	67.38	0.65	3.80
(iii) Selling cost	36.73	0.37	2.08
(iv) Gross cost	179.13	1.80	-
(v) Purchase price of paddy	1582.99	15.83	-
(vi) Return from paddy	2011.79	20.12	-
(vii) Total return excluding losses	1992.28	19.92	-
(viii)= ((vii)-(v) Marketing margin (Value addition)	409.30	4.10	23.23

(ix)=(viii) - (iv) Net marketing margin (profit)	140.59	1.41	14.54
--	--------	------	-------

Source: Field Survey, 2014

5.4.3 Value addition due to Selling Cost

Rice selling cost includes the cost of loading product into transport, cost of bag or sack, transport charge etc. Total selling cost of rice was Tk. 36.73/ quintal and that was 8.97% of total cost. Selling cost added 2.08% value with the rice price.

5.4.4 Net Marketing Margin or Profit of Miller

Rice millers added the highest value with paddy and rice. Net marketing margin was Tk. 140.59/quintal and added 14.54% value with the whole process of getting rice from paddy. Total value addition by rice millers was Tk. 409.30 /quintal and that was about 23.23% more than the paddy purchase price.

5.5 Value Addition Activities of Rice Trader

Rice traders were the last actors in the Value chain of rice marketing. There were two types of rice traders e.g. *Beparies* and retailers. Collecting rice from rice millers *Beparies* sold their product to the retailers in different local markets. Sometimes to meet the rice demand *Beparies* used to collect rice from other district market for example nearest Noagaon district. But some rice retailers also used to collect rice from small scale rice mills directly. Ultimate consumers get rice through rice retailers from local market's retail shop.

Transportation was the main cost of value addition by the rice traders. Average transportation cost was Tk. 21/quintal which was 12.69% of total value addition. The average transportation cost of local market rice traders was Tk. 21.00/quintal. Marketing margin or value addition was Tk.165.40/quintal which was 6.11% more than paddy purchase price.

CHAPTER VI

THE CONSTRAINTS AND OPPORTUNITIES OF RICE VALUE CHAIN

6.1 Introduction

According to Bangladesh Economic Report-2013, Bogra district is one of the key Rice Producing districts in North Bengal Region of Bangladesh. Most of the farmers were continued subsistence. Normal flooding affects farmers and incurred defeat from yield indulge. Moreover, government services were not available in the study areas. Agricultural wing services were not accessible during cropping season. Farmers were generating to produce some other cash crops like Potato and banana for better profit and good marketing opportunities. Traders and millers of the study areas were not conscious about the better opportunities of value chain. Therefore, they could not make chosen returns. However, researcher recognized some opportunities beside with some constraints to improve the rice value chain. Constraints and opportunities are discussed below.

6.2 Constraints in Rice Value Chain

Due to unawareness and unavailability of modern technologies none of the actors in the study areas completed best use of rice value chain. The study identified the constraints as follows:

6.2.1 Farmer's Constraints

Farmers faced two main constraints. The first one was related to paddy production and second one was related to value adding with paddy.

6.2.1.1 Production Related Constraints

- a) High cost of input materials of rice production such as fertilizers, irrigation, labour etc. Therefore, farmers did not earn the expected profit covering their production cost. Almost 90 percent respondent farmers claimed that high cost of input materials particularly high cost of fertilizer and irrigation were main problem faced by them.
- b) Due to unavailability and inaccessibility of modern technologies such as power tiller, disc harrow, deep tube-well etc. very low yield was resulted. Moreover, about 90 per cent farmers of the study areas used fragmented and small piece of land for paddy production. As a result they could not use modern technologies in their land.
- c) Although this study has been conducted basically based on the previous paddy season and in that time irrigation was not very essential except some exceptional cases. But about 75 percent farmers mentioned about the problem of interrupted electricity supply during irrigation period. Moreover diesel price was high, as a result getting timely and sufficient irrigation were not possible.
- d) About 90 percent farmers used their own cultivated seed for next season. But they could not maintain the quality of seed. Moreover, unavailability of quality seed in the market was a great problem faced by the farmers. Only some large farmers used modern technologies with quality seed purchased from well reputed seed company. Adulterated seed reduced the average yield of paddy.
- e) In the harvesting season supply of paddy remains higher than demand which reduced the price of paddy. Small farmers had to sell their large portion of paddy for instant cash. So they could not wait for better price in future.

- f) Roads and highways were not well developed and also transportation facilities were not good. For these reasons marketing cost was high. Farmers had to sell their product locally at relatively lower price to the *Farias* and *Beparies* at the farm gate.
- g) Unavailability of agricultural subsidy and credit support. Financial institutes were not available to provide credit support and local money lenders charged high interest rate. Marginal farmers had not any access in the financial support from banks and other NGO's due to complex procedure of getting credit. About 20 per cent large farmers had access in the bank loan. Krishi Bank was only agricultural credit lending institute in the study areas.
- h) Farmers claimed that they had not access in government procurement program. This is why they could not manage fair price in the time of harvesting.
- i) Paddy producers reported that production of paddy needs proper doses of fertilizers, water and other inputs, in addition to special care with respect to timely agronomic practices. The production cost of paddy was high since inputs requirement was high. It was difficult to manage sufficient capital on the part of the producers. Most of them could not invest capital from their own sources. Problems related to the availability of credit by farmers were that 90 percent of the fanners in all the farm sizes faced lack of capital as a production problem whereas the problem was more acute to small farmers than medium and the large farmers.
- j) Most of the farmers were illiterate and unaware of the attack by pests and diseases on their paddy. They were not well trained. Over 75 percent of all farmers reported that the diseases and pest attack adversely affected their paddy production.

6.2.1.2 Value Adding Constraints

Most of the farmers were not familiar with the value chain activities and its` effectiveness. Moreover, due to immediate cash needs, the farmers were not able to fetch the advantages of value addition. The study found the following problems in paddy value addition.

- a) Value addition by storing paddy was risky due to price fluctuation. Paddy market was very volatile as to why there was no surety of getting better price in the time of di-storing.
- b) Farmers had to make a suffering sale. A large portion of paddy was sold at the harvesting season to meeting up the family expenses and debt repayment.
- c) Marketing cost was very high due to high transportation cost.
- d) Lack of market information such as price at local and other markets. .

6.2.2 Paddy Trader

Paddy traders were relatively in better position. *Farias* added value with paddy more than the farmers without taking any risk. They purchased and sold paddy in the same market by just transferring paddy from farmer to the *Beparies*. Thus, without any cost the *Farias* received profit in the same markets.

- a) Rice millers and large *Beparies* purchased paddy directly from the markets and also from the farmers.
- b) Bad infrastructure and transportation system increased the transportation cost.
- c) Lack of credit facility.
- d) About 80 percent paddy traders were not informed properly due to their negligence. Moreover as a lag behind area Lack of market information was an obstacle for effective value chain in the study areas.

6.2.3 Rice Miller

Rice millers were the main actors in the rice value chain system. Millers added the maximum value in paddy marketing. Rice millers could add extra value in three ways. Firstly they purchased paddy thus, added the marketing costs. Then paddy was husked in the mills and in this step milling costs were added with the paddy. Finally, rice and bi-products were sold thus, selling costs added to rice. It was found that the rice miller`s net margin or profit was the highest in rice value chain. Although the rice millers were the main value adding actors but they also had to face some constraints. The problems were as follows:

1. Rapid fluctuation of paddy and rice price and also rice market causing changes in the costs and profit structure of the rice millers. About 90% rice millers claimed that when paddy price increased then they could not increase rice price because due to time lag of milling. So they had to incur loss or reduce profit margin.
2. Lack of uninterrupted electricity supply compelled the millers to use high cost fuel. Thus their costs increased but output price do not increase as per cost. About 100% rice millers of both Bogra Sadar and Kahalu upazilas claimed that at least 10-12 hours of the day they had to depend on fuel for running the rice mills. In the peak season electricity supply hampered their production more than that of other times. As a result cost of milling increased but rice price could not be changed.
3. Transportation system and infrastructure were not developed. So paddy purchasing and rice selling cost both were higher than other regions of the country.
4. About 80% rice millers reported that they had to face difficulties due to shortage of paddy in the local markets. In some recent years individual mobile paddy husking machine was used to husk paddy by travelling door to door. Some small scale paddy traders (mainly *Farias*) supplied rice to

rice retailers by husking paddy from travelling rice mills. As a result most of the large rice mill cannot use their capacity due to shortage of paddy in dull season and rainy season due to bad natural calamity.

5. Paddy could not be stored for long time due to uncertainty of better price in future. Moreover shortage of fund for storing rice millers could not store large scale paddy.
6. Small rice millers claimed that they could not enter into government rice procurement program.

6.2.4 Rice Trader

Traders were the final value chain actor in the rice value chain system. The researcher has identified some constraints related to rice value addition. These constraints were as follows:

- a) Transportation cost was very high because transportation system was not developed. But it was observed that roads were being repaired. According to the report of rice traders when all the roads will be repaired transportation cost will reduce about 10.0%-15.0% on an average.
- b) Rice price was not stable. Therefore, rice traders could not take the advantage of high price in off-peak season. Every week rice price fluctuated by 10.0%-15.0% rice price fluctuate. For this reason rice traders could not store rice for long time.
- c) Demand for rice was more or less same in a specific market. About 90.0% traders mentioned that their everyday sales varied by 10.0% only. So traders couldn't increase scale of selling at any time.
- d) Almost 100% traders mentioned about market risk. They had little support in case of any uncertain situation e.g. distorted supply of rice due to strike, natural calamities etc. Therefore, traders couldn't increase their business activities.

Some common problems were identified after analyzing the constraints of all the value chain actors high cost of paddy production and low product prices discouraged the value chain actors. Credit facilities were limited in the study areas. Non-governmental organization charged high rate of interest. Money lenders also charged very high interest and were found 120 percent annually. Grading and standardizing were not familiar to the value chain actors. Poor infrastructure and transportation facilities along with high fuel price were responsible for high transportation cost. As a result there was huge variation of price in different markets. Market information was not available to the producers and small traders.

6.3 Opportunities

Some opportunities were also identified. If the value chain actors were well financed they could gather their product for better price in future. Storing paddy and rice could ensure accessibility of rice and reduce price risk. Modern technologies might reduce the cost of production thus; marketing margin would increase, so transportation system has to be enhanced to reduce transportation cost. This would reduce the marketing cost which in turn would reduce consumer's prices. But it has been seen that in the study areas road and communication were being developed gradually by government.

By discussing with the actors it was found that value chain would enlarge the volume of business in the study area. Because value chain always mobilize business activities in the form of various marketing functions. Farmers would have concerned about better price of better quality of paddy. Good quality seed requirement would increase due to increase in demand for better yield and price also. Moreover some other farmers would try to store paddy for better price in off season. Thus a balance would make in demand and supply that would stabilize the market price. Other actor including rice millers would increase their volume of business if they got their required paddy or rice in the local area. Thus all the

actors involved in the value chain would ensure better income with stabilized, charge and riskless price. Ultimate consumer would get rice in reasonable price as increase in volume of business would decrease marketing costs of the value chain actors.

6.4 Conclusions

Value chain actors in the study areas were not concerned about the value chain activities but the study establish that the actors added value with the products (paddy and rice). If the opportunities could have been utilized would be helpful to improve the rice value chain.

CHAPTER VII

SUMMARY AND CONCLUSION

The main objective of the study was to analyze the value addition of rice in various marketing stages. However the specific objectives of the study are as follows:

- v) To estimate the value addition of rice by the different actors
- vi) To examine the activities related to value addition of rice by different actors.
- vii) To identify the constraints and opportunities in rice value chain.
- viii) To suggest policy options and recommendations for improving value and supply chain of rice.

The main issues covered were the value chain functions and cost structure of paddy production, marketing at the post-production level, processing of paddy in rice mills and bi-products, and finally marketing of rice and by products. The data used for estimating production cost structure were based on the face to face interview with farmers, paddy traders, rice millers and the rice traders of Bogra Saadar and Khalu upazilas of Bogra district.

7.1 Summary

Farmers were the primary value adding actors who produced paddy and supplied it to the markets. They barely covered their cost of production. Farmers of the study region faced various problems. Therefore, average rice production was not very rational. Frequent flooding affected rice production in the study areas. Besides, some problems were lack of input, lack of power supply for irrigation, high cost of inputs, unavailability of modern technology, and lack of timely credit.

The paddy yield rate was found to be 50 quintal/acre of paddy. Total variable cost of production was Tk. 21,250.00 which was about 69.96% of total cost. Labour cost was the highest at about Tk. 14,850.00 which was 48.89% of total cost. Gross cost was the sum of total variable cost and total fixed cost. So, the gross cost was Tk. 30375.00 per/acre for producing per quintal paddy it was Tk. 1320.65 per/acre.

Gross return from paddy and straw was Tk. 32,320.0 per/acre. Gross return was the sum of return from paddy and straw where return from paddy produced was Tk. 32,200.0 and from straw was Tk. 4,320.0 Gross margin of per acre land was Tk. 15,270.0 and it was Tk. 6145.0 for per quintal paddy. Net margin or profit from paddy production was Tk. 6145.0 per/acre. Net return was very small indicating that the farmers can hardly cover their variable cost of production. If the rental value was considered the net return could become very insignificant.

Among all the value adding actors, farmers got the lowest share. Farmers added value through various activities e.g. cleaning paddy, drying, storing, marketing in different time and in different markets and by processing (like seed, rice, etc.). After meeting the family needs, some farmers stored paddy for selling when the prices went-up. On an average, paddy was stored for three months. By drying paddy farmers added about Tk 105.0 per/quintal. Farmers could add Tk 100.0 per/quintal extra value if they sold paddy in the markets instead of selling at farm gate. The percentages of value addition through drying, marketing and storing were 7.97%, 7.64% and 6.94%, respectively. That means on an average farmers add 7.13% value with paddy.

Paddy traders were second types of actors in rice value chain. Mainly the *Farias* and *Beparies* were the paddy traders. Paddy traders collected paddy from local farmers of Bogra Sadar and Kahalu upazila and supplied to the rice millers in the same areas. Major part of paddy was assembled for selling in local markets named Matidali bazaar, Gokul bazaar, Ghoradhap bazaar, Kahalu bazaar etc. On top of

that, some large rice millers collected paddy from Pabna, Gaibandha, Naogaon, Natore etc.

Like farmers, the paddy traders were engaged with different activities such as grading, sorting, storing, drying etc. Paddy traders assembled paddy from the farmers and supplied to other large traders or the millers. Transportation cost, loading, unloading etc. were the value adding activities of paddy traders.

Total marketing cost of paddy was 53.03 Tk. /quintal which was about 57% of value addition. Among the variable costs transportation cost was the highest which was about Tk. 23.75/quintal. Total variable cost was Tk. 48.91 (92.24% of total cost) and total fixed cost was Tk. 4.11 (7.76% of total cost). Average purchase price of paddy was Tk. 1,425.0 per/quintal and average selling price of paddy was Tk. 1510.83/quintal. Value addition by the paddy traders was Tk. 85.83/quintal which was 6.03% of total.

Rice millers were the third types of actors in rice value chain. They were the largest value adding actors. They purchased paddy from the markets or farmers through their own agents. After collecting paddy, rice millers crushed the paddy for getting rice as the main product and also other bi-products like bran, husk and broken rice. Finally the millers sold their rice and other bi-products to the rice traders and in some cases also to the retailer.

Transportation, loading/unloading, millings, bagging etc. were mainly the value adding activities of rice millers. For milling paddy, all value adding activities such as boiling, drying in the sun, husking, bagging, storing etc. were done. Labour cost of milling, fuel/electricity cost, managerial cost, bagging cost, storing cost etc. were the main sources of value addition for husking paddy.

Problems of rice millers were shortage of electricity, high fuel cost, high labour cost, unavailability of labour, shortage of paddy supply, high transportation cost, poor infrastructural and transportation system etc.

Rice millers had to incur cost in three stages i.e. paddy purchasing, milling and rice and bi-product selling. Among these, marketing cost of paddy was the largest about Tk. 76.95/quintal. This was 24.52% of total cost. Total milling cost was Tk. 67.38/quintal of which total variable and fixed cost was cost was Tk. 51.88/quintal and Tk. 15.15/quintal, respectively. Milling cost was 21.47% of total cost. Total selling cost of rice was Tk. 36.73/quintal which was 11.71% of total cost. From paddy purchasing to selling rice, millers added value of about Tk. 313.78/quintal.

Rice traders were the last actors of rice value chain. In the study area there were *Beparies* and retailers. Rice traders had limited scope for value adding. Rice retailers do not get opportunity to fluctuate price of rice in the same market areas. But they have opportunities to fluctuate rice price in different markets. It has been seen that retail price of rice in Bogra Sadar upazila was about 4-5% lower than the retail price of Kahalu upazila. It has found that in Kahalu upazila the number of rice mills was more than Bogra Sadar upazila and for this reason supply of rice was more in Bogra Sadar upazila than Kahalu upazila.

Transportation cost was the main cost of rice trader. The average transportation cost was Tk. 21.00/quintal. Total marketing cost of rice was Tk. 55.84/quintal. Rice traders added about Tk. 165.42/quintal. Purchasing and selling price of per quintal rice was Tk.2710.42 and Tk. 2875.82, respectively. Net margin or profit from per quintal rice was Tk. 109.58 (table 4.9).

In the long value chain of rice maximum value added by rice millers was about 23.23% or Tk. 409.30 per quintal and lowest value added by rice traders about 6.11% or Tk. 165.40 per quintal (table 4.9).

7.2 Conclusion

The findings of the study expose that the producers could not direct predictable net margin due to high cost of production and low production price. Most of the production was consumed by the farmers. Some large farmers stored paddy and later sold in the market. Farmers disposed their rice for family consumption, gift to the friends and relatives, sale and used as a seed. Moreover, a large number of people were involved in the production and marketing activities. So the farmers and intermediaries could certainly be benefited financially if production and marketing system of rice were well developed.

Like the whole Bangladesh the production of rice in the study areas was really influenced by post-harvest problems such as storage, price fluctuation; demand for rice etc. Rapid fluctuation of rice price was observed. Rice millers were not interested to enlarge their business because of some constraints. Electricity unavailability and labour shortage and high labour wage were the main problems.

There were some opportunities to improve the rice value chain. The opportunities of the value chain were:

- i. Value chain actors could imagine about the market and forth coming opportunities having a silent work of the sector;
- ii. All types of value chain actors could give attention to detail at all phases of the value chain;
- iii. Linking sector`s stakeholders and their initiatives;
- iv. Providing ways for government involvement when clear issues were identified;
- v. Building an organized and effective sector environment;
- vi. Increasing buyer confidence; and

The farmers were the first actor in rice value chain, but they did not receive fair price. They have limited scope of value addition.

RECOMMENDATION

7.3 Recommendation

On the basis of the findings, the following recommendations were made for the improvement of existing production, marketing and storage system.

- i. Government should provide sufficient credit and subsidy to the farmers and other value adding actors.
- ii. In the time of harvesting minimum price of paddy should be declared by government to ensure that they can cover their production cost.
- iii. Government would get important information and find the way to monitor the market to lessen the price fluctuations.
- iv. Value chain analysis is an effective source of market information. So the market information obtained from it should be made available and easily accessible for all value chain actors.
- v. Uninterrupted electricity supply should be made available for the paddy producers in the time of irrigation season and also for rice millers to reduce their cost.
- vi. To keep rice price at reasonable range unnecessary prolongation of value chain should be eliminated. For example if the farmers have the opportunity to sell their paddy directly in the market or to the rice millers that would reduce the extra value added by *Farias* and *Beparies*.
- vii. Infrastructure and transport system should be developed to keep paddy and rice price lower. But if price become lower then farmers would occur loss. In input costs for paddy production should be reduced or subsidized.

- viii. Diversified use of rice and processing technology should be made available for the farmers.
- ix. Government should finance the farmers in the time of paddy cultivation period and also after harvesting. This would reduce the price fluctuation and also ensure the demand supply equilibrium. As most of the farmers could not store their paddy due to need of cash money. As a result in the peak season there is an excess supply of paddy i.e. rice. During off season there occur shortages of paddy. For that reason, government could not assume about the supply and demand for paddy. This would reduce in the farmers were capable to store their paddy up to a certain period. That would ensure better price for the farmers in the time of harvesting and also could ensure comparatively lower price in the off season.
- x. Finally value chain actors are needed to informed about the value chain system and also other actors should have proper knowledge about this. If the actors were informed about value chain that would make the rice market more efficient and that would give good return to all kind of actors. Moreover grading system would be introduced by the rice millers to maintain the rice quality.

REFERENCES

- Acharya, S.S. and Agarwal, N.L.(2004). “Agricultural Marketing”, New Delhi, Oxford and IBN Publishing Co. Pvt. Ltd.
- Akhter, T. (2009). “Value Chain Analysis of Dairy Sector in Rangpur District”. An M.S. Thesis Agricultural Economics (Marketing) Thesis, submitted to the Department of Agribusiness and Marketing, Bangladesh Agricultural University, Mymensingh. Bangladesh.
- Alam, M.M.(2004). “Technical Performance of Some Selected Rice Mills of Bangladesh”. An M.S. Thesis, Department of Farm Power and Machinery, Bangladesh Agricultural University, Mymensingh.
- Alvero, M. J. (2008). “A Value Chain Study of Rice in Abuyog, Leyte’. An Undergraduate Thesis”, Department of Development Studies, Ateneo de Manila University, Manila. (Accessedat:[http:// www. scribd.com/ doc / 7279938/A- Value-Chain-Study-of-Rice-in-Abuyog-Leyte](http://www.scribd.com/doc/7279938/A-Value-Chain-Study-of-Rice-in-Abuyog-Leyte)).
- Anna, N. (2006). Supply Chain Network Economics: Dynamics of Prices, Flows, and Profits, Edward Elgar Publishing, 2006.
- BBS (2010). Yearbook of Agricultural Statistics of Bangladesh. Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the Peoples Republic of Bangladesh, Dhaka.
- Dooren, I. C. (2005). Rice value Chain Analysis. International Fair Trade Association.
- Farm Management Division (2009). Bangladesh Rice Research Institute, Gazipur, Bangladesh.

Feller, A., Dan S., and Tom, C. (2006). Value Chains Versus Supply Chains,
(Accessed at <http://www.bptrends.com>)

Field Service Wing (2011), Department of Agricultural Extension, Dhaka,
Bangladesh

Fries, R. and Akin, B. (2004). “Value Chains and Their Significance for
Addressing the Rural Finance Challenge”, Micro report, Accelerated
Microenterprise Advancement Project, USAID.

Government of Malawi (2009). Staple Foods Value Chain Analysis, Country
Report, November 2009, Chemonics International Inc, Malawi.

Hossain, M. (2004). “Marketing System of Kataribhog Rice in Some Selected
areas of Dinajpur District”. M.S. in Agricultural Economics (Marketing)
Thesis, Department of Agribusiness and Marketing, Bangladesh
Agricultural University, Mymensingh. Bangladesh.

http://en.wikipedia.org/wiki/supply_chain_management.

http://en.wikipedia.org/wiki/value_chain_management

http://en.wikipedia.org/wiki/Value_added.

<http://www.bids.org.bd/RcntRsrchDetails.php?id=93&Page=Research%20Details>.

http://www.brri.gov.bd/info_services/index.htm

<http://www.encyclopedia2.thefreedictionary.com/valueaddition>.

<http://www.fao.org/docrep/013/i1710e/i1710e01.pdf>

http://www.knowledgebank.irri.org/ericeproduction/Importance_of_Rice.htm

<http://www.knowledgebank-brri.org/riceinban.php>

<https://en.wikipedia.org/wiki/Rice>

Humphrey, J., (2002), “*Value Chain Approach: Linking National Producers to International Buyers and Markets,*” Institute for Development Studies

Hussain S.S. (2012). Bangladesh Gain Report , USDA, Gain Report Number: BG2001, dated:22/02/2012.

IDE (2002). Sub-sector Analysis and Market Assessment, Fine and Aromatic Rice Sub-sector. A report prepared by International Development Enterprises (IDE) Bangladesh.

IFDC (2008). Study of the Domestic Rice Value Chains in the Niger Basin of Mali, Niger, and Nigeria, West. Working Paper. September 2008. An International Center for Soil Fertility and Agricultural Development (IFDC)Africa. (Accessedat: http://www.commonfund.org/uploads/tx_cfc/CFC_W_Africa_Domestic_Rice_Value_Chains.pdf)

Issa S. (2010). ‘Market Analysis Tool-How to Conduct a Food Commodity Value Chain Analysis,’ Technical guidance sheet, Food Security Analysis Service, European union.(Accessed at: <http://www.wfp.org/food-security>).

Kabir, M.S. and Mamun, M.R.A (2006). “Supply and Value Chain Analysis of Closed Drum Thresher”, A Project report, Department of Farm Power and Machinery, Bangladesh Agricultural University, Mymensingh.

Kapur, B.N, (2003). “A Diagnostic study report of rice milling industry at Karnal (Haryana), India”. Prepared by: B.N.Kapur, Cluster Development Executive, Small Industries Service Institute. Karnal-132001, (Haryana).

Kotlar, P., Armstroy, G. (2006). Principles of Marketing, 11th ed., Pearson

Education Ltd., New Jersey 07458, USA. pp. 35-42.

Lambert, D. M., Cooper, M. C. and Janus D. P., “*Supply Chain Management: Implementation Issues and Research Opportunities*,” *The International Journal of Logistics Management*, Vol. 9, No. 2 (1998), pp. 1-19.

Minten, B., Murshid, K.A.S., and Reardon, T., (2012). "Food quality changes and implications: Evidence from the rice value chain of Bangladesh," 2012 Conference, August 18-24, Foz do Iguacu, Brazil 125280, International Association of Agricultural Economists.

MoA. (2010.) Ministry of Agriculture, Government of Peoples Republic of Bangladesh, Dhaka.

Moi, B. (2010). “Adding value: structure, coordination and support of links in the chain”. *The Journal of Trade and Marketing. Trade and Markets Division, FAO*. Rome, Italy

Mustafa. K. M., Ahmed. N., Hossain. I. (Forthcoming). “*Improving Food Security through Value Chain Management: A Study of Rice Value Chain in Bangladesh*.” Research paper, Bangladesh Agricultural Research Institution, Dhaka.

Pearson S, Stryker JD and Humphreys CH. (1981). *Rice in West Africa: Policy and Economics*. Stanford University Press, Palo Alto, CA.

Porter M. (1985). The value chain was described and popularized by Michael Porter in his 1985 best seller, *Competitive Advantage: Creating and Sustaining Superior performance*, New York, NY the Free Press. ([http://en.Wikipedia.org/wiki/value chain](http://en.Wikipedia.org/wiki/value_chain)).

Rahman, A. (2010). “Value Chain Analysis of Musroom in Selected Areas of Dhaka District”. M.S. Agricultural Economics (Marketing) Thesis,

submitted to the Department of Agribusiness and Marketing, Bangladesh Agricultural University, Mymensingh. Bangladesh.

Ripa, N. A. (2009). “Assessment of Post Harvest of Rice in Selected Areas of Bangladesh”. M.S. in Agricultural Economics (Marketing) Thesis, Department of Agribusiness and Marketing, Bangladesh Agricultural University, Mymensingh. Bangladesh.

Shaha, T. K. (2007). “Supply and Value Chain Analysis of Centrifugal Pump”. An M.S. Thesis, Department of Farm Power and Machinery, Bangladesh Agricultural University, Mymensingh.

Stryker J. D. (2008). Developing competitive rice value chains, Associates for International Resources and Development (AIRD), 60 Bartlett Avenue, Arlington, MA 02476, USA. P-2.

Thublier, F., Hanby, T. Shi. Y. (2008). Value Chain = Supply Chain + Demand Chain: New Approaches to Creating and Capturing Sustainable Value. *The Journal of Institute for Manufacturing University of Cambridge, Cambridge, CB3 0FS, UK, p.-2.*

Tomek, W.G. and K.L. Robinson (1977). *Agricultural Product Prices*. Cornell University Press. London.

UNIDO, CBN, BOI. (2010). Unleashing agricultural Development in Nigeria Through Value Chain Financing. Working Paper. November 2010. United Nations Industrial Development Organization (UNIDO), Vienna, Austria. (Accessed at: http://www.3adi.org/tl_files/3ADIDocuments/Country%20information/Nigeria/Unleashing%20Agricultural%20Development%20VCs%20Nigeria.pdf)

United States Agency for International Development (2009). Global Food Security Response: West Africa Rice Value Chain Analysis, New York, USA, micro-report #16.

World Food Programme (2010). "Market Analysis Tool-How to Conduct a Food Commodity Value Chain Analysis?" Technical Guidance Sheet, September. Accessed at: <http://www.wfp.org/food-security>

Zaman, Z. U., Mishima, T. H., Shuji, G. M. (2003). 'The Role of Rice Processing Industries in Bangladesh: A Case Study of Sherpur District'.