OPPORTUNITY AND CHALLANGES OF RICE VALUE CHAIN IN THE SELECTED AREA OF MYMENSINGH DISTRICT

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CERTIFICATE

This is to certify that the thesis entitled **"OPPORTUNITY AND CHALLANGES OF RICE VALUE CHAIN IN THE SELECTED AREA OF MYMENSINGH DISTRICT"** submitted to the Department of Agribusiness and Marketing, Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Sher-e-Bangla Nagar, Dhaka in partial fulfilment of the requirements for the degree of **Master of Science (MS) in Agribusiness and Marketing**, embodies the result of a piece of bona fide research work carried out by **MD. SONET HOSSAIN, Registration No. 12-05168** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma. I further certify that any help or source of information, as has been availed of during the course of this investigation has been duly acknowledged by the Author.

Dated:
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THIS THESIS IS LOVINGLY DEDICATED TO

MY PARENTS

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OPPORTUNITY AND CHALLANGES OF RICE VALUE CHAIN IN THE SELECTED AREA OF MYMENSINGH DISTRICT

ABSTRACT

This study was conducted to analyze the supply chain of rice in selected areas of Mymensingh district. The objectives of the study were to estimate value addition of rice by different actors, to examine the activities related to value addition and to identify the constraints and opportunities of rice value chain. Two Upazilas namely Fulbaria and Muktagacha were selected purposively for collecting data. To serve research objectives 40 farmers, 20 paddy traders, 12 rice millers and 13 rice traders were selected by purposive sampling. Data were collected during March to May 2019. The study found that the value chain actors were farmers, paddy traders (*Farias, Beparies*), rice millers and rice traders (*Beparies and retailers*). Value chain started from harvesting paddy and ended when rice was sold to the ultimate consumers. Farmers could earn on an average Tk 3800.00 per acres by cultivating paddy. The farmers disposed their production for family consumption, gift and kind payment to relatives, seed and sold to markets. They added value of Tk. 100.5, Tk. 100.00 and Tk. 100.00 for per quintal paddy by drying, storing and selling, 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. 127.00/quintal paddy. Rice millers had to incur marketing cost, milling cost and selling cost. These costs were Tk. 77.03, Tk. 68.38 and Tk 37.25 per quintal paddy, respectively. Rice millers added about 18.68% value of total marketing cost. Rice traders were the final value chain actors and added about 6.50% value with rice purchase price. Since, this study was done only in Mymensingh 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 Mymensingh district.

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%	Percentage
BBS	Bangladesh Bureau of Statistics
BIDS	Bangladesh Institute of Development Studies
BINA	Bangladesh Institute of Nuclear Agriculture
BLB	Bacterial Leaf Blight
BRRI	Bangladesh Rice Research Institute
CIMMYT	International Maize and Wheat Improvement Center
DAM	Department of Agricultural Marketing
ECR	Efficient Consumer Response
et al.	*et alia* (and others)
etc.	*et cetera*
FAO	Food and Agriculture Organization
HIES	Household Income and Expenditure Survey
HYV	High-Yielding Varieties
i.e.	That is
IDE	International Development Enterprises
IFDC	International Fertilizer Development Centre
IFOAM	International Federation of Organic Agricultural Movement
IPCC	Intergovernmental Panel on Climate Change
m. tons	Metric Tons
MOA	Ministry of Agriculture
NAP	National Agricultural Policy
No.	Number
PKSF	Palli Karmo Sahayak Foundation
PRSP	Poverty Reduction Strategy Paper
SCM	Supply chain management
Tk.	Taka (Bangladeshi currency)
VECM	Vector Error Correction Model

CHAPTER I

INTRODUCTION

In our country rice is a main staple food. Most of the people in our country eat rice every day. In Bangladesh, a major food security goal is to attain self-sufficiency in rice so that the country can meet its complete requirements from domestic production. The main concern has received added importance especially after the crisis that affected the global of the food market. In order to obtain the goal, the government's policy is to make available enough support to the rice farmers to assure competitive advantage of the rice sector through the provision of subsidized inputs in conjunction with procurement and trade policies and other measures.

The more effective rice value chain would supplement the existing government policies to develop the performance of rice supply chains, and thus the competitive advantage of the participants in the chain (including farmers), through higher levels of co-ordination and value creation among the chain members. It is expected that this would lead to develop value creation and more equitable value sharing among the chain participants, with positive influence on food security.

The agricultural economy of Bangladesh is heavily dependent on rice. It is estimated that almost three-quarters of total cropped land in Bangladesh is devoted to paddy cultivation, and per capita rice consumption is one of the highest in the world. Based on national surveys, food grain consumption for an average person in urban and rural areas in Bangladesh is shown to have stabilized over time at about 160 and 180 kilograms per person per year, respectively (Bangladesh, Bureau of Statistics 2005). Rice is the main food grain product (wheat makes up only 2 percent of total food grain consumption for urban consumers, 6 percent rural), and it is estimated that rice expenditures make up 40 percent of total food expenditures. Rice contributes more than 63 percent and 71 percent of the caloric intake of urban and rural consumers, respectively. It is important in the consumption basket of poor and rich alike: The poorest quintile consumes 139 and 146 kilograms of rice per capita in urban and rural areas, respectively (Bangladesh, Bureau of Statistics 2005).

Significant changes have happened to rice cultivation in Bangladesh over time. While rice acreage has changed little in the past decades, there have been changes in the relative importance of different seasons. Rice is produce in three seasons in Bangladesh: the part rain fed, part dry aman season (harvest in December–January); the dry boro period, when crops are irrigated (harvest in April–May); and the rain fed aus season (harvest in August–September). Aman acreage has changed little over time, but *boro* acreage has increased substantially and aus acreage has declined accordingly. This has also led to changes in seasonal price patterns of rice (Murshid *et al*. 2009). Production of rice overall has increased significantly over the last 40 years. Due to the proliferation of shallow tube wells and the development of high-yielding dry-season rice varieties (boro rice), rice yields have increased dramatically and the share of dry-season rice has increased from 10 percent of the country's rice production in 1966/67 to 61 percent in 2008 (Hossain 2009).

The success in the increase of rice production has been strongly related to the release and wide adoption of different High-Yielding Varieties (HYV) in recent decades, triggered by the liberalization of key input markets, particularly irrigation, equipment, and fertilizer (Hossain, Bose, and Mustafi 2006; Ahmed 2000; Hossain, 1988). In the 1970s and 1980s, these HYV used genetic material from the Philippines and were mostly focused on coarse grains. Especially the rise of irrigated *boro* season HYVs drove the green revolution in Bangladesh. Behind those reason the most of the parent lines came from short-grained Japanese varieties, most HYVs are also short and, therefore, coarse varieties. While the earlier generation lacked disease resistance, this changed with newer varieties released in the 1980s. The second-generation varieties that have been introduced since the mid-1990s have used other international genetic material and emphasized on shorter plant heights (for example, BRRI dhan 28, BRRI dhan 29). They were rapidly adopted because of high yields, shorter maturity, and relatively good grain quality, causing a shift away from coarse rice varieties (Hossain, Bose, and Mustafi 2006).

An important factor in any food market is quality. The most universal distinction used in the rice sector in Bangladesh relates to the shape and size of the kernel. The coarser

the grain, the wider or fatter it is (relative to the length). Coarse rice grains used in Bangladesh have a width of more than 2 millimeters. This compares with 1.7 to 2.0 millimeters for medium rice and less than 1.7 millimeters for fine rice (Rahman 2004). This distinction between fine, medium, and coarse rice grains is widely used and well known by farmers as well as traders, and we will therefore use it as a step for quality throughout this paper. While the quality of rice is judged by a number of factors, such as physical appearance, transparency, milling, degree of processing (whiteness), percent of brokenness, aroma, texture, and nutritional quality, these are often difficult to measure objectively (Rahman 2004).

Fine rice is seemingly the least important of the three at the national level. It was estimated in 2002 that fine rice made up about 10 percent of the land allocated to rice cultivation (International Development Enterprises 2002) while the World Bank (2008) evaluated the importance of fine rice in total rice production at 5 percent. Unfortunately, no good nation-wide updated statistics on the share of these three categories were available at the time of writing of the paper.

With the process of urbanization, the entire city citizens depend on their capacity to purchase rice. So rice shifts from rural to urban areas. It absorbs the largest share of household consumption. The poorest households devote much more of their expenditures to rice consumption than the well-off groups. According to a study, the bottom 40 percent of rural household spends 35 percent on rice and wheat, whereas the bottom 40 percent of urban household spends 25 percent on rice and wheat. Rice is one of the world leaders in the per capita consumption of slightly more than 150 kilos of milled rice per person annually. In Bangladesh it is 166 kilos annually. It supplies 76 percent of total calorie supply and 66 percent of total protein intakes of an average person in Bangladesh. This ratio is among the highest in the world (Monthly Technology Today, May 2014, P.42).

In addition to the national level, the per capita daily consumption of food grains has been disaggregated between the poor and the non-poor both in rural and urban areas. To determine the poverty status of the respondents, the division specific inflation

adjusted income levels of the upper poverty line was applied from the HIES 2010 estimates (see Table 6.10 of the HIES, 2010 Report). The income of the respondents was estimated as the net income from different sources, such as agriculture, livestock, vegetables, fruits and wood produced in the homestead, services, business, wage labourers, pension and social safety nets.

PER CAPITA DAILY FOOD GRAINS (RICE AND WHEAT) INTAKE BY POVERTY STATUS AND PLACE OF RESIDENCE

	Rural			Urban (*in grams*)		
	Poor	Non-Poor	Difference (sig.)	Poor	Non-Poor	Difference (sig.)
Cereals	547.33	576.20	28.87*	393.84	328.20	-65.64
Rice	525.00	546.00	21.00	324.00	240.00	-84.00
Wheat	22.33	30.20	7.8***	69.84	88.20	18.30***

Note: * and *** indicate statistically significant at 10% and 1% level respectively.

Source: BIDS Field Survey, 2012.

The estimates of per capita daily food grains consumption among the poor and the non-poor in rural and urban areas are reported in Table II. While the per capita consumption of cereals significantly differs between the poor and the non- poor in rural areas, it does not do so in the urban areas. As rice is the dominant component in the consumption of cereals in both areas, it does not differ significantly between the poor and the non-poor. On the other hand, per capita daily consumption of wheat significantly differs between the poor and the non- poor in both the rural and urban areas.

The projected values indicate that the per capita consumption of rice will increase for poor in the rural areas but will decrease for the other three groups over the years, albeit marginally. While the per capita consumption of wheat for both the poor and non-poor will decrease in the rural areas, it appears to increase in the urban areas for both the groups. The projected estimates suggest that urban people will consume a relatively less amount of rice than rural people and are expected to substitute rice consumption with other food items including wheat in the future.

PROJECTED PER CAPITA DAILY CONSUMPTION OF RICE AND WHEAT

	Rice					Wheat				
	Rural		Urban		All	Rural		Urban		**All**
	Poor	Non-poor	Poor	Non-Poor		Poor	Non-poor	Poor	Non-poor	
2012	525.0	546.0	324.00	240.0	466.9	22.3	30.2	69.8	88.2	41.6
2013	525.7	545.8	323.4	238.2	465.5	21.4	28.9	70.4	89.4	41.4
2014	526.3	545.6	322.9	236.3	463.9	20.5	27.8	70.9	90.6	41.3
2015	526.9	545.3	322.3	234.5	461.5	19.7	26.6	71.6	91.8	41.4
2016	527.6	545.1	321.7	232.7	459.4	18.9	25.5	72.1	93.0	41.5
2017	528.3	544.4	257.9	231.9	458.1	18.1	24.5	72.9	95.6	41.5
2018	528.9	544.0	257.4	230.3	456.8	17.4	23.5	73.6	97.2	41.6
2019	529.6	543.7	257.0	228.7	455.4	16.6	22.5	74.3	98.7	41.7
2020	530.3	543.4	256.6	227.1	454.1	15.9	21.6	74.9	100.3	41.8

1.1 Value Chain

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

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

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

- Products pass through a value chain or sequence of activities, with value added in each stage from design to transforming inputs, reaching to final market;
- Increased globalization has contributed to the dispersal of these activities over

greater distances; and in chains dominated by the increasing concentration and clout of retailers, value is increasingly derived by product differentiation and innovation that reduces cost and enhances the importance of reliable supply In case of agricultural commodity e.g. rice value chain focus on various value adding opportunities to ensure better price as well as demand supply equilibrium.

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. A series of value generating activities associated with product marketing from farm level to the final 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.

1.2 Value Chain Technique*s*

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

I. **Mapping:** 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 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.

II. **Participatory approach:** 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 fully overcome. Because each player along a value chain affect 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 processing, value chain analysis needs the participation of the full range of stakeholders. This range includes many groups (i.e.in case of rice value chain Faria, Bepari, wholesaler, rice miller, retailer etc.), processors, producers, input suppliers, public agencies and associations that affect industry, trade, market labour and commercial regulations and practices.

1.3 Rice Value Chain

Upon paddy production, a pre-requisite to a good and efficient marketing system is the capability 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. The processing 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 rice 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 labour.

A long value chain and enough price and margins derived by the actors are one of the main causes for its price instability. This is why it is very effective to analyze the value chain of rice for identifying the value chain activities of various 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. Farmers and the traders expect the higher price of paddy or rice in the off-peak season.

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. Generally, in some automatic rice mill white rice is produced without any manual touch.
- 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, quality and other attributes. Rice can be standardized by varieties, moisture content, presence of spoil of rice etc.

Rice imports depend on the level of domestic production, stocks and demand for rice in the particular year in the country.

After independence, the population in Bangladesh has increased continuously; food production growth rates could not keep pace with the population growth rate, which resulted in huge volume of imports from different countries. However, domestic production cannot meet the total demand of the country, every year Bangladesh has to import huge volume of rice from international sources to feed her people.

The study presents two important concerns related to food security in Bangladesh:

(i) The role of rice in the country's food security in the midst of fundamental changes in marketing and distribution of rice in a transitional economy; and

(ii) Potential of utilizing value chain in improving competitive advantage of the rice sector which can create significant positive impact on food security

1.4 Components of an Agriculture supply chain

Supply chain management (SCM) implies managing the relationships between the businesses Agribusiness responsible for the efficient production and supply of products from the farm level to the consumers to meet consumers' requirements reliably in terms of quantity, quality and price. In practice, this often includes the

management of both horizontal and vertical alliances and the relationships and processes between firms.

Agri-supply chains are economic systems which distribute benefits and apportion risks among participants. Thus, supply chains enforce internal mechanisms and develop chain wide incentives for assuring the timely performance of production and delivery commitments. They are linked and interconnected by virtue of shared information and reciprocal scheduling, product quality assurances and transaction volume commitments. Process linkages add value to agricultural products and require individual participants to coordinate their activities as a continuous improvement process. Costs incurred in one link in the chain are determined in significant measure by actions taken or not taken at other links in the chain. Extensive pre-planning and co-ordination are required up and down the entire chain to affect key control processes such as forecasting, purchase scheduling, production and processing product launches etc.

Following are the components of an organized agri- supply chain:

1.**Procurement or sourcing**

programming, sales promotion, and new market and

2.**Logistic management**

a. Transportation

b. Material management

c. On the premise of supplying mostly from production not stock

d. Warehousing

e. Logistics Network modeling

3.**Organizational management**

a. Contracting

b. Strategic alliances and partnerships

c. Vertical integration

i. Long term storage

ii. Packaging technology

iii. Cold chain management

iv. Energy efficient transport

v. Quality and safety

4**. Application of Efficient Consumer Response (ECR) System**

a. Electronic scanning of price and product at the point of sale

b. Streamline the entire distribution chain

CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

The purpose of this chapter is to review of previous studies, which are related with the present study. There are some studies on value chain of vegetables and fisheries in Bangladesh but studies on rice value chain in Bangladesh are scanty. The review is presented and discussed below.

2.2 Supply Chain

The supplychain is a system of organization, people, activities, information and resource involved in moving a product or service from supplier to customer . In commerce supply chain management, the management of the flow goods and services, involves the movement and storage of raw material of work process inventory, and of finished goods from point of origin to point of consumption. Supply Chain Management has been defined as the design, planning, execution, control, and monitoring of supply chain activities with the objectives of creating net value, building a competitive infrastructure ,leveraging worldwide logistics ,synchronizing supply with demand and measuring performance globally. Supply chain Management, technique with the aim of coordinating all parts of supply chain from supplying raw material to delivering and resumption of product, tries to minimize total cost with respect to existing conflict among the chain partners. A supply chain is a network between a company and its suppliers to produce and distribute a specific product to the final buyer. This network include different activities, people, entities, information and resource. Supply chain and value chain are often thought to be the same thing. In fact, supply chain and value chain are two different concepts. Some research findings on rice supply chain are presented and discussed.

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.

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.

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.

2.3 Value chain

Value chain is the process or activities by which a company add value to an article, including production, marketing and the provision of after sales service. A value chain include a business model which describes the full range of activities needed to create a product or service. 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.

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.

Kapur (2003) found value addition of raw rice (Grade-A) milling unit as process cost which includes Rs. 69.6per 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= 1.20 Taka)

Alvero. M. (2008) indicated 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 mostsmall 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.

Tasnoova and Iwamoto (2006) found the marketing systems of *Kataribough* rice in Bangladesh with the help of primary data that was collected purposively from 24 farmers and 65 intermediaries from Sadar Thana of Dinajpur district. Primary data were collected during the months of January and March, 2000. Attempts were made to identify the marketing system of *Kataribough* rice to estimate marketing costs and margins as well as investigate marketing problems with probable suggestive measures. *Faria, Bepari,* the miller, *Arathdar* and the retailer who were involved in *Kataribough* rice marketing formed a complex marketing channel in the study area. The total marketing cost of *Kataribhog* paddy/rice incurred *Faria,* and *Bepari* were Tk.28.44 and Tk.34.00 per quintal while the marketing cost by the miller, *Arathdar* and retailer were Tk.92.90, Tk.16.79 and Tk.7.21 per quintal respectively. The marketing margin of *Faria, Bepari,* the miller, *Arathdar* and the retailer were Tk.38.50, Tk.49.45, TK.118.98, Tk.39.07 and Tk.45.58 per quintal respectively. The margin was the highest for the millers followed by *Bepari*, the retailer, *Arathdar* and *Faria*. Regarding net margin, retailer received the highest net margin (38.37) followed by miller (26.08), Arathdar (Tk.22.28) and Bepari (Tk.15.45). The Faria obtained the lowest net margin (Tk.10.06). Major problems faced by the farmers and intermediaries were lack of **18** capital, poor communication and transportation facilities, lack of adequate storage facilities, lack of adequate market information, higher market tolls, lack of market facilities etc. The farmers and intermediaries also suggested some solutions to these problems.

Alam (2005) indicated 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.

Ismail and Verbeke (2010) conducted a study on "Evaluation of rice markets integration in Bangladesh" and they put emphasis on the liberalization of the agricultural sector in general and the rice subsector in particular that has been a major component of Bangladesh's structural adjustment program initiated in 1992. However, the government has continued to intervene in the rice subsector. Basically their paper examined whether the regional/divisional rice markets was spatially integrated following the liberalization of the rice market or not. Wholesale weekly coarse rice prices at six divisional levels over the period of January 2004 to November 2006 were used to test the degree of market integration in Bangladesh using co-integration analysis and a Vector Error Correction Model (VECM). The Johansen co-integration test indicated that there were at least three co-integrating vectors implying that rice markets in Bangladesh during the study period were moderately linked together and therefore the long-run equilibrium was stable. The short-run market integration as

measured by the magnitude of market interdependence and the speed of price transmission between the divisional markets was weak.

2.4 Conclusion

Value chain of rice is very important in the terms of Bangladesh. Till now sufficient research study had not been improved in this important area. So, very extensive and in-depth research works are emergency needed for providing information for the policy makers so that better policies can be formulated.

CHAPTER III

METHODOLOGY OF THE STUDY

3.1 Introduction

Methodology is an indispensable and integral part of any research. The reliability of specific research depends to a great extent on the appropriate methodology used in the research. Lack of methodology often leads to odds results. So, careful considerations are needed by a researcher to ensure a scientific and logical methodology for carrying out his research. The researcher has get the responsibility in describing clearly what sorts of research design, methods and procedures are to be followed in selecting the study areas, the sampling techniques, analysis of assessment data, and forecast of the results to find at the correct conclusion.

3.2 Selection of Study Area

Selection of the study area is an important measure for any research. The study areas should be selected considering the higher concentration of paddy production and paddy processing mills and easy accessibility of the researcher. Therefore, the present study were indicated at Mymensingh district which was purposively selected considering the higher concentration of rice production, processing mills, and also the availability of logistic supports for data collection. Again, two Upazilas namely fulbaria and Muktagacha were selected in consultation with Agriculture Officer and Sub Agriculture Assistant Officer of the respective Upzillas for collecting primary data.

The area of the study was Mymensingh district. Two specific upazilas, namely, Muktagaca and Fulbari are chosen for this study. The reasons for selecting the Mymensigh district for the present study are as follows:

i. Mymensingh is one of the widely rice producing district of Bangladesh.

ii. The researcher was known with the local farming, local culture, belief and other feature of the area.

iii. Rice mills were available mainly in the two upazilas selected and also produce about 41%-47% of rice of total production in Mymensingh district because these two upazilas utilize about 38% of the land area of the district.

Fig 3.1.: Research Area (Fulbaria and Muktagacha Upazila of Mymensingh District)

3.3 Study Period

The present study covered six months' period that started from January 2019 to July 2019. Data were collected during the time from March 2019 to May 2019 through direct interviews with farmers, rice traders, rice millers and rice traders using a structured survey schedule. For collecting supplementary data such as cost and return from rice, 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 and personnel only Aman season was selected for the research.

3.4 Sample Size

Paddy growers, paddy traders, rice millers and rice traders of Fulbari and Muktagacha upazilas were considered as the population of the study. Indicating the limitations such as time and resources, it was not possible to include all the farmers, traders and millers. So, the sample included 40 farmers and 45 other value chain actors (20 paddy traders, 12 rice millers and 13 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	40
Paddy trader (*Faria, Bepari, Aratdar*)	20
Rice miller	12
Rice trader	13

3.5 Preparation of the Survey Schedule

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, result 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 affect 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.

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 40 schedules for farmers, 20 for paddy trader, 12 for rice millers and 13 for rice traders and total number of schedules was 85. Farmer's schedule 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, cost 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.

3.6 Research Instruments

The success of a research and survey depends on the proper design of the schedule. Keeping in mind the research objectives, a preliminary structured interview schedule and checklist was carefully designed for collecting data from the selected respondents. The preliminary schedule was pre-tested with a few farms of the study area by the researcher himself. During interview, if any correction, change or modifications were needed then field editing was done and thus some parts of the draft schedule were developed, modified and re-arranged in the light of the actual and practical experience gained from the pretesting. The schedule was finally improved in a simple manner so that appropriate information could be acquired without repetition and misunderstanding.

Researcher followed the main aspects of a schedule viz. the general form, question sequence and question formulation and wording to make schedule. Different set of questionnaire was prepared for different group of intermediaries. Questionnaire had took on such type of questions which are relevant (i.e. cost of production, cost of buying and selling, cost of milling, number of mills, buying and selling price of different intermediaries in different channel, etc.) to the study.

3.7 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 oscillated to answer the questions but when they were determinated that the study was an academic research, so it would not invade them adversely in any way, they fully associated in giving information.

During interview, the researcher asked questions systematically and explained the questions whenever it was felt necessary. Farmers were used to providing correct data as far as possible. If there were such items, which were overlooked or contradictory, 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, Farmer experience level, farm size of the farmers etc. were also collected from various secondary sources such as books, journals, newspapers, different organizations and webs.

3.8 Data Collection

Most of the respondents did not keep written record of their farm and business activities. So the researcher had to collect primary data by interviewing them with

a questionnaire. To obtain the correct data, repeated visits to the respondents were made to stimulate their memory.

3.9 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

3.9.1 Gross Return and Net Return of the Farmers

The gross rate of return is the total rate of return on an investment before the deduction of any fees, commissions, or expenses. **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:

$GR=\Sigma QP.PP + \Sigma Qs.\ Ps$

where,

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

QP= Quantity of paddy (quintal/acre)

PP= Average price of paddy (Tk/quintal)

Qs= Quantity of straw (quintal/acre)

Ps= Average price of straw (Tk/quintal

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

  π = Gross return - (variable cost + fixed cost)

  Here, π = Net return (profit)

3.9.2 Margin Received by Marketing Actors

Margin Received by Marketing Actors

Marketing margin refers to finished goods that are purchased and resold and is the difference between the price at which you purchase a product and the price at which you sell the product through the distribution

channel. Marketing margin is the difference between the producer and consumer prices. Marketing 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 = $\frac{\text{Marketing Margin}}{\text{Purchase Price}}$ X 100

3.10 Processing and Analysis of Data

The filled up interview schedules were analyzed and edited in order to remove any unclear and inconsistencies 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 suitable 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 found the results.

CHAPTER IV

VALUE ADDITION BY DIFFERENT ACTORS IN RICE MARKETING

Introduction

Value addition is the difference between the price of product or service and the cost of producing it. The price is determined by what customer are willing to pay based on the perceived value. Value addition activities are mainly concerned with the alterative of utilities. In economics, the sum of the unit profit, the unit depreciation cost, and the unit labour cost is the unit value added.

In the context of macroeconomics, it refers to the contribution of the factors of production, i.e. land, labour, and capital goods, to raising the value of a product and corresponds to the incomes perceived by the owners of these factors. The national value added is shared between capital and labour (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.

4.1 SUPPLY CHAIN OF THE RICE INDUSTRY

As rice is the basic grain of daily consumption in Bangladesh, it always has the significant demand which shows a seasonal growing trend especially at the time of festivals and during the seasons of cultural events. To identify the appropriate demand and meet them properly in a profitable way is primary concern of rice supply chain. A proper supply chain management framework is very essential for efficient sourcing, processing, distribution, and retailing and hence meeting the customer demands without facing a situation of lost sales. Production and business of rice has been one of the most traditional and major concerns of Indian Economy, but still no proper supply chain framework for it has been developed, which very often causes unfulfilled demands.

Supply chain process is not as direct for the small land holding inorganic farmers. Inorganic farmers with small land holding either sell their rice in 'Bapari', a marketplace in the town areas where the small farmers of nearby villages sell their yields from farms and the processing units purchase the grains and vegetables from, either directly or through agents, which is indicated as a convenient place for the small paddy farmers to sell and also for rice processing companies to procure. Or in another way the rice processing companies procure the paddy through Middlemen or Agents, who purchase the paddy from small farmers in small quantities and then sell them in bulk to the rice processing companies. Direct production is not profitable for the rice processing companies from the small farmers, as their cost of logistics and supply chain will be very higher comparatively the cost of sourcing through 'Middlemen 'Agents'.

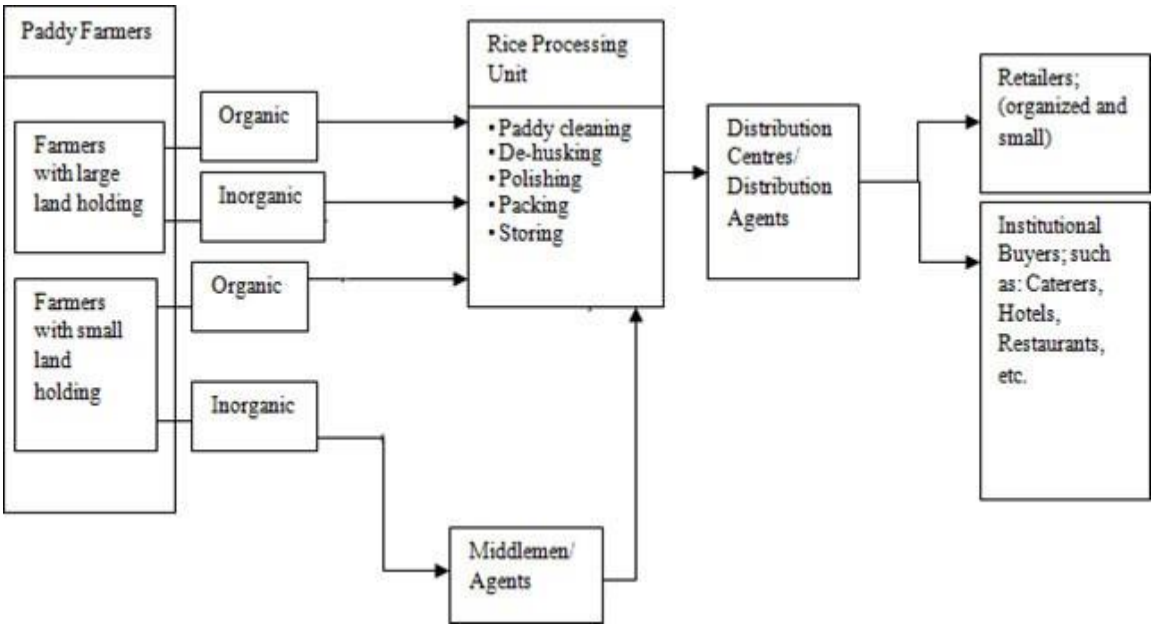

Figure 4.1 : Rice supply chain process

4.1.1 Collaborative framework

A regular framework with the help of information management tools which requires interchange of data between the rice processing companies and retailers; is very necessary from the co-ordination point of view and meeting the customer demands efficiently without bearing the risk of unsatisfied customer and loss on sales. Information plays a very important role in the collaborative structure of the supply chain, and hence information management is vital at all the stages of the supply chain, in the age of information . Improper management of information may result in 'Bullwhip Effect' i.e. variability of inventory planning and forecasting at different levels of supply chain, which may lead to overstocking or stock outs of the inventory.

Rice processing unit and the retailer must share their information with each other in order to collaboratively forecast and plan the inventory. A well designed collaborative framework as shown in Figure 3 is required to increase the efficiency of the supply chain in rice sector. The collaborative framework describes how information flows between the rice processing company and the retailer, in order to collaboratively plan and forecast the inventory.

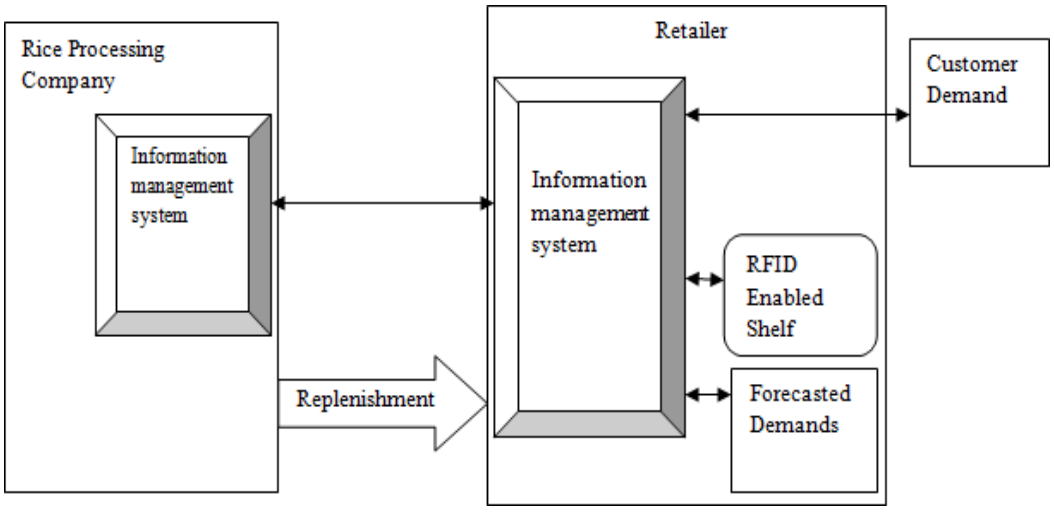

Figure 4.2: Collaborative framework

Information system of the retailer, which have the information of the customer demand, information of inventory level on the shelves with the help of RFID system, and forecasted demands; shares all the information with the information system of the rice processing company. After analyzing the information and collaborative planning,

the rice processing company replenishes the required variety in the planned predetermined quantity to the retailer.

4.1.2 Inventory Management

Dealing with the inventory is a major issue in the supply chain management system of the rice sector. The traditional supply chain in the rice sector in Bangladesh has always confronted the challenge of availability of the right inventory. Inventory management in rice supply chain requires proper forecasting of demand, inventory planning, and procuring of the inventory at the right time. Customer demand of the different varieties of rice for the whole season or year should be forecasted in advance while considering all the fluctuations because of festivals and social and cultural events.

However, it may not be necessary to keep inventory for all the forecasted varieties of rice, as they may occupy the rice processing unit's storage capacity and block the space for some variety of more demand. In practice it has been found that many of the rice processing units are loaded with high inventory which is due to a large number of variants irrespective of their demand, which results in overstocking of the varieties with lower demand and stock outs of the varieties with higher demand.

The rice processing company in this case should drop the processing of the varieties carrying comparatively lower demand say up to 5% of total demand over the period of a time. Processing and stocking these varieties blocks the space for other demanded varieties as their movement is slow. While not processing and keeping these varieties will free the space and room for the rice varieties which are really in demand. However, not to disappoint the customers of these varieties and to maintain the relationship with them, the rice processing company should collaborate with the hullers where they will source these varieties from, on the specific customer demands.

Rice processing companies are suggested to adopt the consolidating demand approach. The approach suggests processing all the nearby demands of same kind of varieties together for gaining economies of scale and reduction in inventory of finished goods which are kept otherwise.

4.1.3 Procurement

Procurement of the paddy by the rice processing company requires a differentiated approach, as varieties of paddy are seasonal in some parts of country while on the other hand in some parts of country paddy is cultivated three times a year. The rice processing company should forecast collaboratively with the help of retailer for the optimum demand of the rice which must be consumed during the year, and should procure the planned paddy at the time of season of rice production in the whole country. The reason behind is, at that time because of the production of rice in the whole country the paddy will be available at the lowest price of the whole year. When the demand fluctuates and more quantity is demanded than forecasted, rice processing company can source the paddy from areas where there is still the season of paddy cultivation.

Seasonal forecasting and procurement is also very essential as some of the varieties of paddy are seasonal and geography specific. For the procurement of these varieties the paddy processing company should forecast their whole year's demand and procure them in their season in the particular geography. Procurement of these varieties of paddy in the off season may result in higher cost to the rice processing company.

Another approach of procurement should be made on the basis of nature of cultivation of the paddy. While procuring the organic paddy, the rice processing company should properly monitor and control the whole paddy cultivation process. It should closely watch and monitor the whole process from seeding, manuring, and till the harvesting because any effort from the farmer to increase the yield may result in pesticide and chemical content in the paddy. In the same way some parameters and monitoring for the inorganic production is also required because, failing to which may result in excessive content of pesticide and chemical in the paddy because of the farmer's effort to gain more yield, which is neither good for customer's health nor it is for the business of company in the long run. Excessive use of pesticides may also make the land barren or infertile for few years and rice processing company may face the problem of non-availability of raw materials.

4.1.4 Logistics System

An efficient logistics system can improve the efficiency of a supply chain, while a bad logistics system will make its situation worse. Rice supply chain in India is facing a

major challenge of on time inventory availability and high logistics cost. To cope between the logistics costs and on time delivery is a big challenge. Either inventory delays from its delivery time or it causes higher delivery cost than which the rice processing unit has estimated to pay. The rice processing company is required to minimize its both inbound logistics expenses and the outbound logistics expenses while reducing the transportation delays. The solution of the problem lies in the efficiency of transportation system and reducing the number of intermediaries. The company should design its transportation very efficiently in case of their transportation system. On the other hand, in case of the third party logistics also there must be the proper collaboration between the logistics service provider and the company hiring the services.

Reduction in the number of intermediaries to the minimum is also suggested for the efficient logistics system. More number of intermediaries results in the movement of paddy to more places and Centre's. It increases the delivery time, transportation delays and transportation cost; which leads to inefficiency of the logistics system. To recover from the problem, the rice processing company should minimize the number of intermediaries. It should take direct deliveries from the big farmers where it will get the paddy in bulk. On the other hand, it should make its own procurement canters where without the involvement of any agent or intermediary the paddy farmer will sell his paddy directly. The same process should also be adapted in the case of downstream supply chain where the bulk amount of rice will be distributed directly to the big retailers and institutional buyers.

4.3 Marketing Channels

A marketing channel is the people, organizations, and activities necessary to transfer the ownership of goods from the point of production of consumption. It is the way products *getto* the user, the consumer and is also known as a distribution channel. 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 final 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 general actors in the study areas.

All the channels identified are shown below:

1. Farmer → Rice Miller → Rice Retailer → Consumer
2. Farmer → Faria → Rice Miller → Rice Retailer → Consumer
3. Farmer → Faria → Bepari → Rice Miller → Rice Retailer → Consumer
4. Farmer → Faria → Bepari → Rice Miller → Bepari → Rice Retailer → Consumer
5. Farmer → Faria → Rice Miller → Bepari → Rice Retailer → Consumer
6. Farmer → Bepari → Rice Miller → Bepari → Rice Retailer → Consumer
7. Farmer → Bepari → Rice Miller → Rice Retailer → Consumer

Fig 4.3.: Rice Marketing Channels of Alternatives

4.4 Farmers level

Tabulated data at farmers` level are presented under the following headings

4.4.1 Age

Age of the farmers varied from 38 to 63 years, the averages are being 47.80 years with the standard deviation of 6.04. According to their age, the farmers were classified into three categories as ``young age" (up to 35 years), ``middle aged" (36 to 50 years) and ``old aged" (above 50 years). The distribution of the farmers according to their age is shown in Table 4.1

Table 4.1 Distribution of the respondents according to their age

Categories	Basis of categorization(year)	Respondents		Mean	SD
		Number	Percent		
Young	Up to 35	0	0	47.80	6.04
Middle aged	36-50	30	75		
Old	Above 50	10	25		
Total		40	100		

Age represented in Table 4.1 indicate that 75% of farmers were middle aged as prepared to 25 % being old and there was no young aged farmer

4.4.2 Level of education

Education level of the respondents ranged from 0.5-16 In accordance with year of schooling. The average education score of the respondents was 6.40 with a standard deviation of 4.40. on the basis of their level of education, the farmer was classified into five categories as shown the table 4.2.

Table: 4.2 distribution of the respondents according to their level of education

Categories	Basis of categorization (schooling year)	Respondents		Mean	SD
		Number	Percent		
Illiterate	0	0	0	6.40	4.04
Can sign only	0.5	2	5		
Primary	1-5	18	45		
Secondary	6-10	14	35		
Above Secondary	Above 10	6	15		
Total		40	100		

Data shown in the table 4.2 indicated that 45 percent of the farmers had primary level of education compared to 35 percent secondary, 15 percent could above secondary, 5 percent had can sign only and 0 percent had illiterate.

4.4.3 Experience

Experience score of the farmers about Experience in rice cultivation of 4 to 25 years with a mean of 11.48 and standard deviation of 4.64. on the basis of experience, the farmers were classified into three categories following in the table 4.3

Table 4.3: Distribution of the respondents according to their level of experience.

Categories	Basis of categorization(year of rice cultivation)	Respondents		Mean	SD
		Number	Percent		
Low	Up to8	14	35.00	11.48	4.64
Medium	9-16	21	52.50		
High	Above 16	5	12.50		
Total		40	100		

4.5 Value Chain Map of the Study Area

Value chain analysis is a strategy tool used to analyze internal firm activities. Its goal is to indicate, which activities are the most important to the firm and which ones could be improved to provide competitive advantage. Paddy traders received rice from local farmers of Muktagacha and Fulbaria upazila and given it to the rice millers located in the same upazilas. The common part of rice was brought about for selling in local markets such as Azim, Boradoba, Biddaganj, Priyapur, etc. On top of that some large rice millers were given who collected paddy from Tangail, Munshiganj Jamalpur, Sherpur, Dinajpur, Rangpur, Naogaon, Bogura district etc.

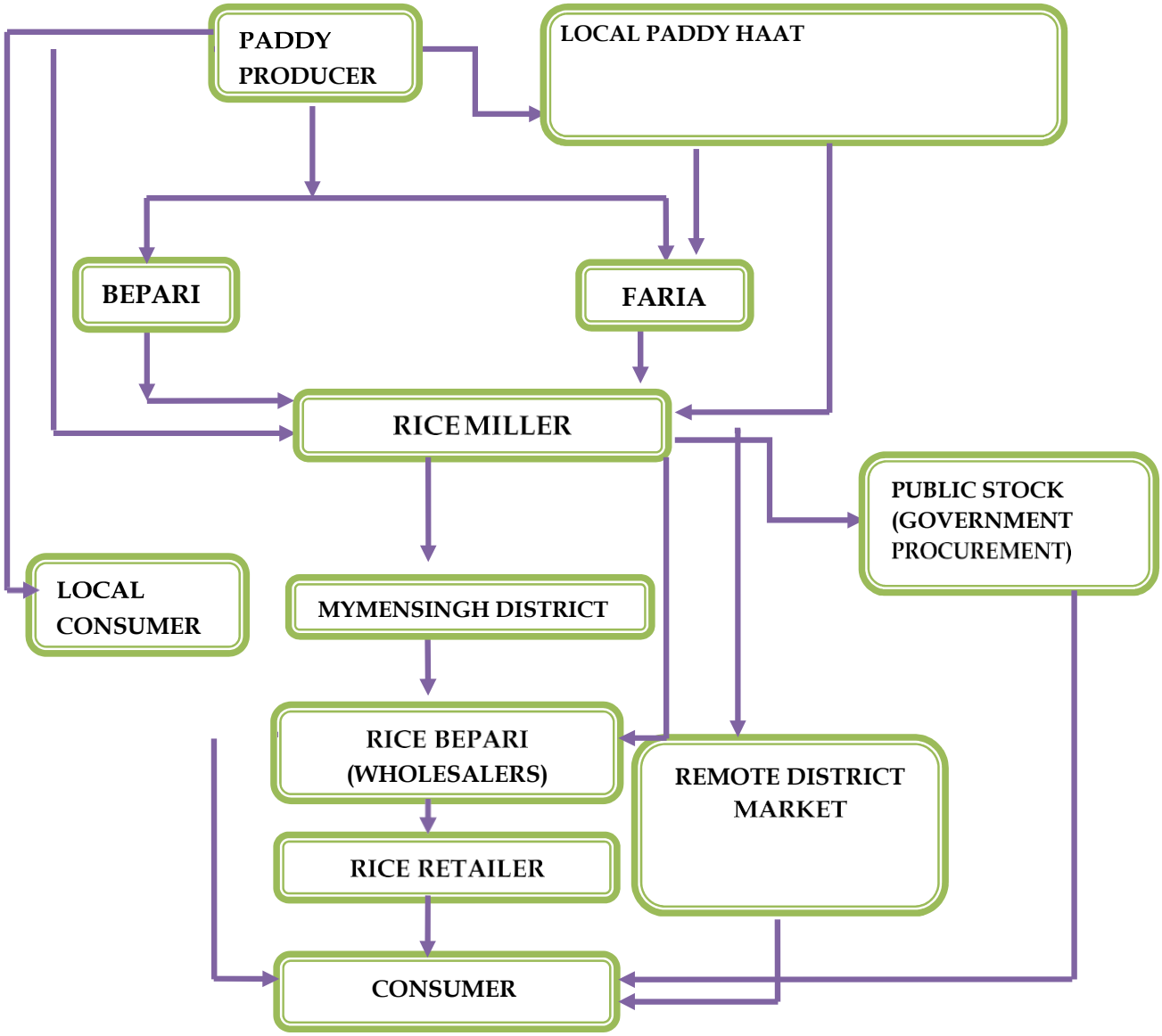

Fig 4.4 Mymensingh District Rice Value Chain

4.6 Costs and Return of Farmers and Value Addition

Return on cost, usually refers to the ratio of the total costs to the sales of the farmer. Costs, returns and value addition of different value adding actors were calculated separately. Main cost items were production cost, marketing cost, transportation cost, miscellaneous cost etc. Returns were estimated by multiplying the total output with per unit price of products and by products. Value addition was simply the difference between the prices of two relating value adding steps.

4.6.1 Cost of Production

In economics, the cost of production of value refers to the price of an object or condition which is determined by the sum of the cost of the the resources that went into making it . 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.

4.6.1.1 Total Variable Cost

Variable costs are the sum of marginal costs over all unit produced. Variable cost are costs that change as the quantity of good or service that a firm produces changes.

For One Acre Land: Sum of the costs of variableinputs for cultivation of one acre land made total variable costs, which was Tk. 25500.00 (Tables 4.5). Total variable costs were 73.91% of total costs. Labour cost constituted the highest and was about Tk. 18000.00 which was 52.17% of total cost.

- **For One Quintal Rice Production:** Total variable costs were the sum of the costs of variable inputs for cultivation of one acre land which was Tk. 1275.00 and was 73.91% of total cost (Tables 4.5). Labour cost was the highest and was Tk. 900.00 per acre, which was 52.17% of total cost.

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

4.6.1.2 Total Fixed Cost

Fixed cost is a cost that does not change with an increase or decrease in the amount of goods or services produced or sold. 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. 9000.00 per acre of land. Interest on operating capital was 16%-25% depending on types of lending authority. Land rent and interest on operating capital together was about 24.78% of total costs.

4.6.1.3 Gross Cost

Gross cost is the entire acquisition cost of object. Gross cost was the sum of total variable cost and total fixed cost. Gross cost was Tk. 34500.00 for one-acre land and it was Tk. 1725.00 for producing one quintal paddy (Table 4.5).

Table 4.4: Percentage Share of Different Cost Items

Cost Items	Tk/acre	Tk/quintal	% of total cost of production
Land preparation	965.25	34.47	2.27
Seed bed	845.75	30.21	2.01
Transplantation of seedling	5582.08	199.36	13.12
Weeding	4225.05	150.89	9.95
Irrigation	950.08	33.93	2.24
Fertilizer application	1975.02	70.54	4.65
Harvesting	5585.25	199.47	13.16
Threshing, winnowing	1884.89	67.32	4.44
Power tiller/ draft power	3225.50	115.1	7.6
Seed/Seedlings	1050.75	3752	2.48
Fertilizer and manure cost	3201.50	114.34	7.54
Insecticides	500.75	17.88	1.17
Irrigation	2375.45	84.88	5.59
Rental value of land	10085.5	360.18	23.76
Total cost of production	42452.37	1516.155	100

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

Table 4.5: Costs and Returns of Paddy Farmers

	Particulars	Quantity (unit)	Price per unit (Tk.)	Total value (Tk./ acre)	Cost or Return (Tk./quintal)	% of total cost or return
Variable costs	Human labour (Man-day)	60	300	18000	900	52.17
	Land preparation (Power tiller or draft power)	2	1000	2000	100	5.79
	Seed/seedlings (Kg)	30	40	1200	60	3.48
	Fertilizer and Insecticide	-		2500	250	7.25
	Irrigation	-		1800	90	5.22
	Total variable costs (TVC)	-		25500	1275	73.91
Fixd costs	Rental value of land(per paddy season)	-		9000	450	26.09
	Total fixed cost (TFC)	-		9000	450	26.09
	Gross cost (GC=TVC+TFC)	-		34500	1725	100
Return and margin	Paddy (quintal)	20	1625	32500	-	84.87
	Straw (1 aati=3kg)	1450	4	5800	-	15.13
	Gross return (GR) xii = x + xi	-		38300	-	100
	Gross margin (GM) xiii = xii – vi	-		12800	-	-
	Net margin (xiv = xii – ix)	-		3800	-	-

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

4.7 Yield and Return from Rice Farming

Rice farming is still at existence level in the study area. Farmers who grow paddy as tenant can hardly cover their cost of production. Considering some exceptional experience the study found that farmers were not getting satisfactory result. But about 70% large farmers mentioned that they got good return as they were acquainted with modern farming. Small farmers could appoint extra family labour but other technological supports were not available for them. As a result they could not cover good return as the large farmers. They thought they only receive the reward for their personal and family labour. Total return is estimated by multiplying the average price per unit (quintal) paddy and total yield. It was estimated by adding the total return from rice and straw (bi-product). If rice was only considered there was no profit atall. Generally, it was found that about 20 quintal rice and about 43.20 quintal straw were obtained from one acre land. Most of the farmers were not introduced with modern technology. They did not use optimum dozes of fertilizer or other intercultural activities. Therefore, the outputs of the farmers were not satisfactory.

4.7.1 Gross Return

The gross rate of return is quoted over a specific period of such as a month, quarter, or year. The gross rate of return is the total rate of return on an investment before the deduction of any fees, commissions, or expenses. 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. 38300.00 Gross return was the sum of return from paddy and straw where return from paddy was Tk. 32500.00 per acre and return from straw was Tk. 5800.00 per acre.

4.7.2 Gross Margin

Gross margin is the difference between revenue and costs of goods sold divided by revenue. Gross margin is the gross return over variable cost. Gross margin was obtained by deducting total variable cost from gross return. Table 4.5 shows that gross margin of one acre land was Tk. 12800.00 and gross margin was Tk. 3800.00.

4.7.3 Net Return (profit)

Net return means as the amount of money received from an investment or a firm activities after all cost have been paid. Net return (profit) was calculated by subtracting total cost of production from gross return.

4.8 Value Addition by Farmer

Value addition is the amount by which the value of an unit is increased at each stage of its production, exclusive of initial cost. The input costs were high in one hand and both the yield and output prices were not sufficient on the other. Moreover, most of the farmers have large family with limited alternative income sources. 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 100.00 per quintal paddy by storing for few months in the study area.

Table 4.6: Value Addition by Farmer in Different Forms

Items	Price	Value addition (TK/quintal)	Value addition (%)
Value addition due to drying	Wet paddy Price	1325.5	-
	Dry paddy price	1430.5	-
	Drying cost	50.50	-
	Marketing margin (value addition)	100.5	7.92
	Net marketing margin	55	-
Value addition due to marketing	Farm gate price of paddy	175.5	-
	Market price of paddy	1475.5	-
	Marketing cost	50.5	-
	Marketing margin (value addition)	100	7.27
	Net marketing margin	49.5	-
Value addition due to storing paddy	Price before storing paddy	1498.75	-
	Price after storing (average 3 months)	1598.75	-
	Storing and marketing Cost	70	-
	Marketing margin (value addition)	100	6.67
	Net marketing margin	30	-

It was found that most of the farmers were not aware about the benefits of value chain.

The matter of fact that they were involved with some traditional value adding activities e.g. drying, cleaning, storing etc.

Therefore, paddy marketing by the farmers was expensive and in some cases it was not beneficial to all when the farmers sold in small amount. Moreover market information system was not available for the farmers to get extra benefit through various value chain activities. Mostly practiced value chain activities have shown in the Table 4.6 with value addition in different forms.

4.9 Paddy Trader

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

4.9.1 Marketing Cost of Traders (Faria and Bepari)

The marketing cost may include expenses associated with transferring of goods to a customer, storing goods in warehouse pending delivery, promoting the goods or service being sold. Different marketing costs items along with share of paddy traders are shown in the table 4.7 Average cost was calculated for paddy traders (Faria and Bepari).

Table 4.7: 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

Table 4.7 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. 1575.85 per quintal. Average value addition by the paddy traders was only Tk. 150.85 per quintal which is 5.46% of total fixed cost.

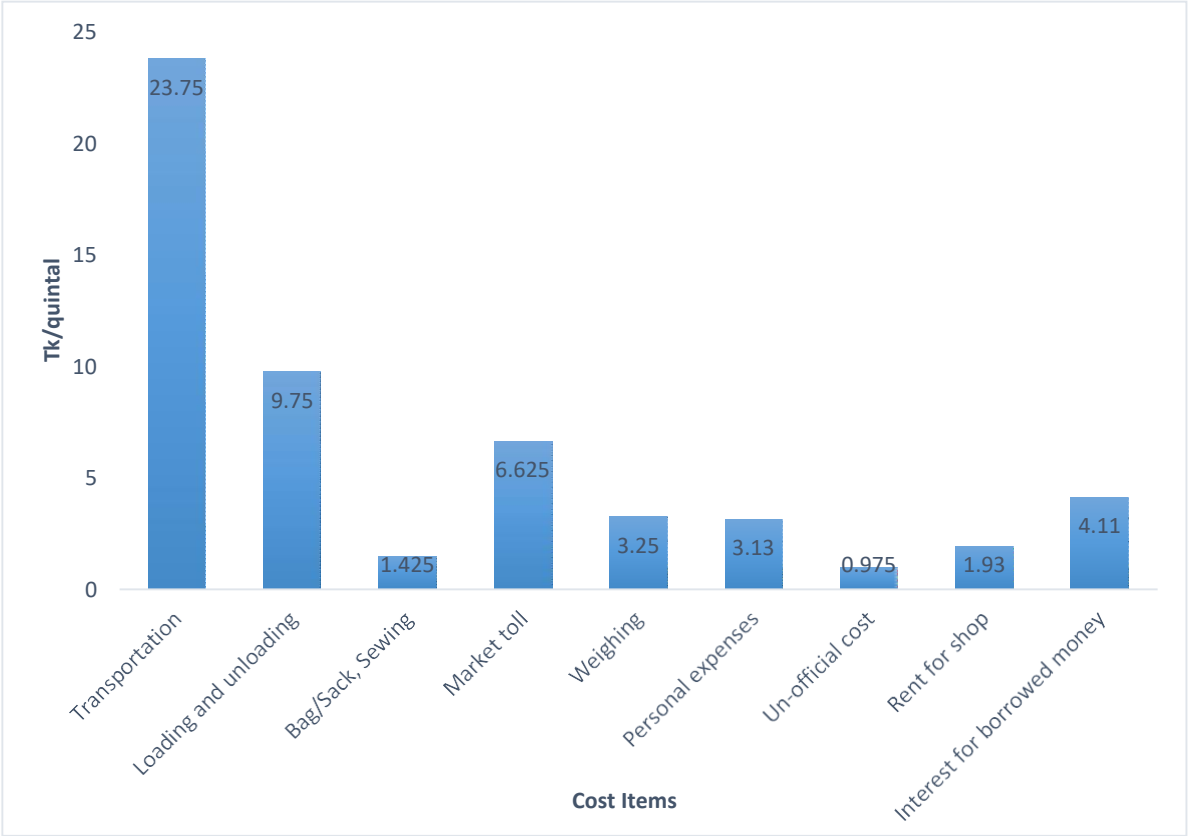

Fig 4.5: Comparison among Various Marketing Costs

In table 4.8 it has shown that the total marketing cost of paddy was Tk. 6900.00 per quintal which was about 45.75% of marketing margin (MM) or value addition. Among the variable costs, transportation cost was the highest and was about Tk.
23.75 per quintal. Total variable cost and fixed cost was Tk. 60.75 (40.27% of total cost) Tk. 8.25 (5.46% of total cost), respectively.

Table 4.8: Marketing Costs, Margins and Value Addition of Paddy Traders

Items		(Tk. /quintal)	% of marketing margin
Purchase price of paddy		1425	-
Sells price of paddy		1575.85	-
Marketing cost	Variable cost	60.75	40.27
	Fixed cost	8.25	5.46
	Total	6900	45.74
Value addition (marketing margin)		150.85	100
Gross margin		90.18	59.73
Net margin		81.85	54.25

4.10 Rice Millers

The basic objective of a rice miller is to remove the husk and the bran layers from the paddy. 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 improved in the study area. Most of the rice mills in the study areas were husking mills except some large semi-automatic mills. Table 4.10 showing that rice millers could add value of total Tk. 318.75 for purchasing, conversion of rice and rice marketing. They added 42.26% 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 4.9 Products Obtained from One Quintal Paddy

Products	Amount(Kg)	% of total	Per unit price	Total value
Rice	66.44	66.44	30.25	2009.81
Bran	5.72	5.72	18.24	104.3328
Husk	21.05	21.05	4.75	99.9875
Broken rice	4.08	4.08	19.25	78.54
Weight loss	2.71	2.71	-	10.75
Total	100	100	-	-

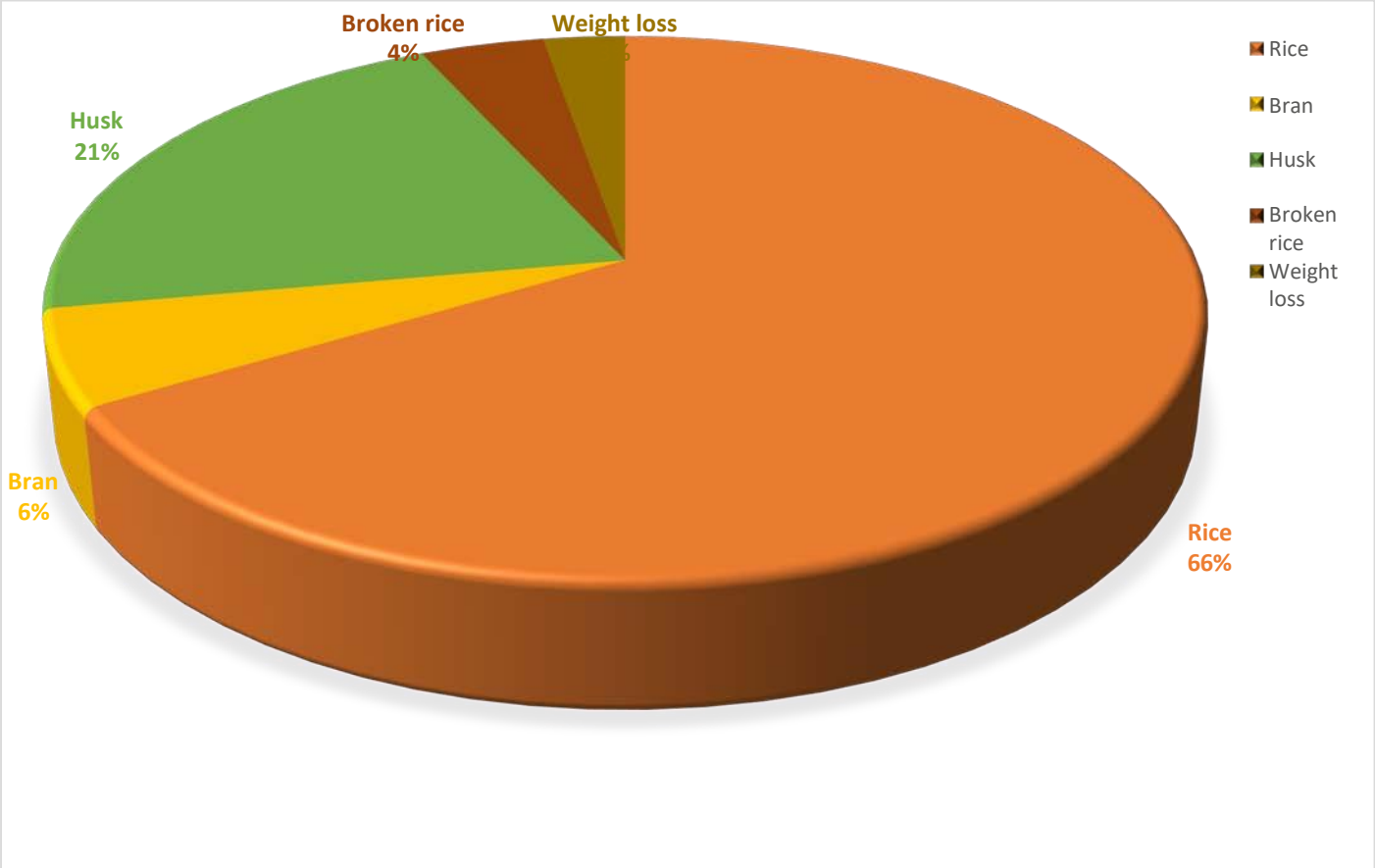

Fig 4.6: Products Obtained from One Quintal Paddy

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.

4.10.1 Total Cost of Rice Miller

Various costs items return and value addition has been shown in table 4.10. 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- purchasing cost of paddy was the largest and was about Tk. 77.03 per quintal which was 42.17% of total cost. Total milling cost was Tk. 68.38 per quintal . Milling cost was 37.42% of total cost. Total selling cost of rice was Tk. 37.25 per quintal which was 20.39% of total cost.

4.10.2 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. 318.75 per quintal paddy.

Value addition starts from purchase of paddy from the paddy traders for selling rice to rice traders. The value adding items and the amounts of value adding are shown in Table 4.6 below.

Table 4.10 Costs and Margins (Value Addition) of Rice Millers

Items		**Tk. /quintal**		**Percent of total Value Added (%)**
Purchasing cost of paddy (i)	Variable cost	61.88	77.03	42.17
	Fixed cost	15.15		
Milling cost of paddy (ii)		68.38		37.42
Selling cost of rice (iii)		37.25		20.39
Gross cost (iv)=(i)+(ii)+(iii)		182.66		100
Purchase price of paddy (v)		1705.75		
Return from paddy (vi)		2035.25		
Weight loss (vii)		10.75		
Total return excluding losses (viii)=(vi)-(vii)		2024.5		
Marketing margin (value addition (ix)=(iv)+(x)		318.75		18.68
Net marketing margin ((x)		136.09		42.26

(* 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 1.51 quintal paddy which added about Tk 323.5 (table 4.11).

Table 4.11 Value Addition from One Quintal Rice by Rice Miller

Items	**Amount (kg)**	**Total value (Tk)**
Required amount of paddy (ii)	151.82	2575.25
Obtained rice (i)	100	2898.75
Value addition (Tk.) (iii)= (i) -(ii)	323.5	
Value addition (%)	12.56	

4.11 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 4.12.

Table 4.12 Cost, Return, Margin and Value Addition of Rice by Rice Traders

	Items	**Quinta l**
Marketing cost	Transportation	18
	Loading and unloading	10.25
	Bag/Sac	8.88
	Market toll (Security charge)	2.25
	Weighing	4.25
	Personal expenses	2.34
	Rent for shop	3.22
	Un-official cost	1.25
	Electricity	4.25
Total cost	Total variable cost	48.75
	Total fixed cost	8.25
	Total marketing cost	57.00
Margin	Purchasing price of rice	2705.25
	Selling price	2880.75
	Marketing margin (value addition)	175.75
	Value addition %	15.275
	Gross margin	127
	Net marketing margin	118.75

4.11.1 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. 18 per quintal. Total marketing cost of rice was Tk. 57.00 per quintal. Costs and returns were shown as average costs of *Beparies* and retailers.

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

Value addition, the price and return pattern of rice traders are presented in table 4.12. Rice traders have limited opportunity to add value among all other cost adding actors. They could add about Tk. 175.75 per quintal extra value with rice value. Purchasing cost of rice was on an average Tk. 2705.25 per quintal and selling price was Tk. 2880.75 per quintal. Net margin or profit of rice trader was Tk. 118.75 per quintal and the profit was Tk. 1.27 per kg rice.

CHAPTER V
VALUE ADDITION ACTIVITIES PERFORMED BY ACTORS

5.1 Introduction

Long and inefficient value chain mainly influences the rice price. In the real worlds situation rice price was very high compared to paddy price. Analyzing the whole value chain of rice it was indicated that rice price was not consistent with rice price what farmers actually received. Farmers got comparatively lower price of paddy. Farmers could not cover expected rice price due to low price of paddy in the harvesting season contrary rice price was more or less stable but high. Rice value chain presented below shows the value adding activities by different actors. The total value chain map and activities are shown in figure 5.1 below.

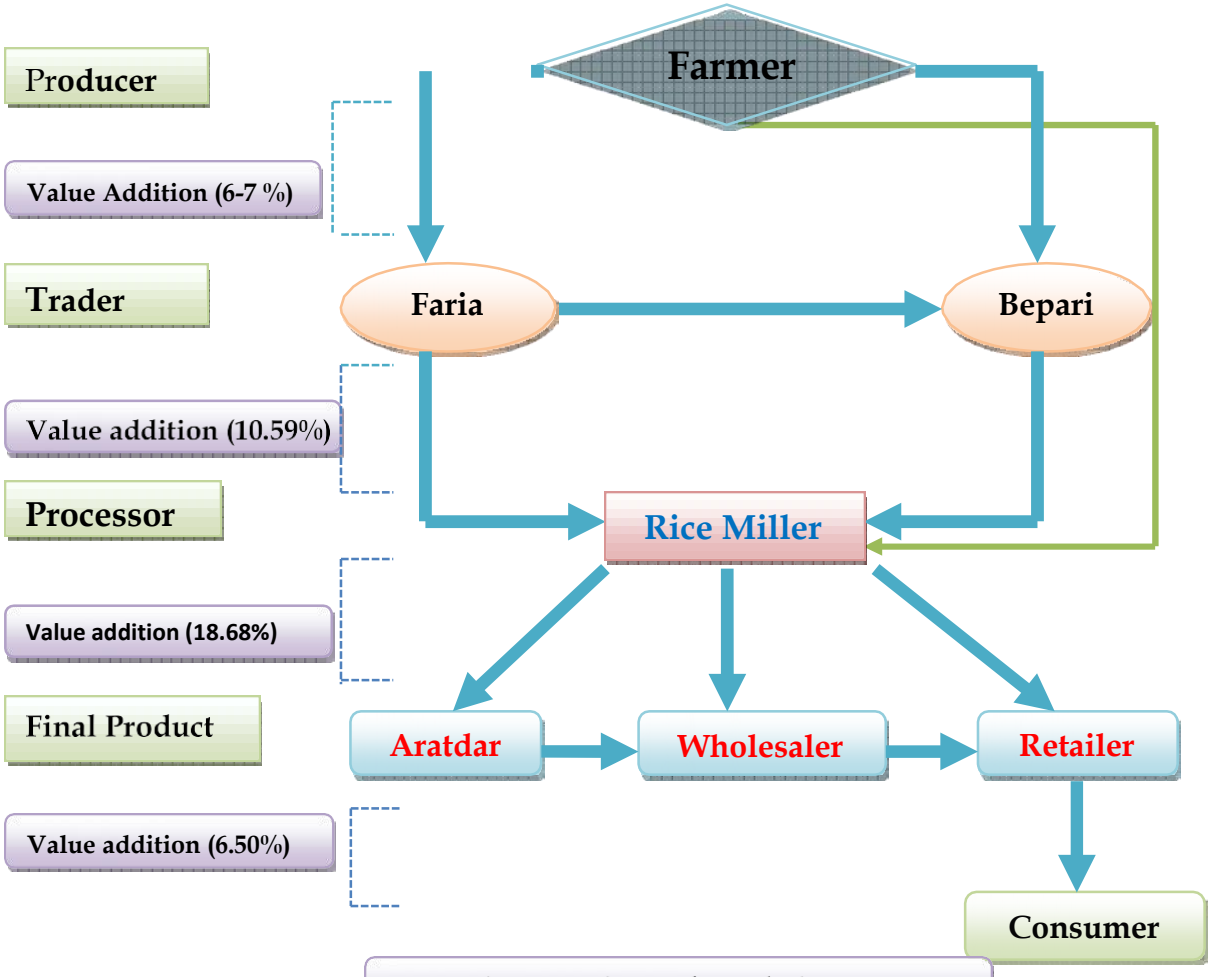

Fig 5.1.: Rice Value Chain Map

5.1 Value Addition Activities of Farmers

Farmers were the first actor of value chain in rice marketing. It was found that the paddy producers could hardly cover total cost of paddy production. Farmers disposed off paddy in four different ways. They were as follows:

Keep as seed for next farming season (farmers keep about 18 kilograms of seed for cultivating 1 acre of land in next farming season),

a) About 70% of paddy is sold,

b) Paid off debts in kind, and

c) Keep paddy for household consumption.

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

In this study only Aman price of the crop year 2019 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 was7.92%.

ii. Value addition by storing paddy was 6.67%. Average storing duration was three months.

ii. Value addition by marketing paddy was7.27%.

5.1.1 Drying

In the rice supply chain the logistic components are identified. 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 decleared that for drying total rice from one acre, the farmers had to use one labour and in doing this the cost was Tk. 50.50 per quintal.

5.1.2 Storing

Very few farmers had the capacity to store their paddy for more than a month because they were in need of immediate cash to pay their outstanding credits. It was found that, sometimes part time paddy traders and large farmers were found 10-15% of their production but for relatively a shorter time for two or three months. It was observed that storing paddy was not profitable because rice price was not increased with the farmer`s expected levels. Farmers generally used traditional mode to store paddy. They found rice in sack/bag. Some farmers used box (Berr/Gola/Dole in local name).

Average duration of storing paddy was three months. Average 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 70.00 tk/quintal and value addition was Tk 100.00 per quintal which was 6.67% of farm gate price.

5.1.3 Marketing

Marketing was an important phase of value addition. Marketing costs included transportation cost, loading and unloading cost, market toll, weighing cost, sweeping cost in the Bazar (weekly market), personal information of the sellers, unofficial cost like broker cost, tips, donation etc. Value addition was found by subtracting farm gate price from market price. Average value addition from paddy marketing was Tk 100.5 per quintal which was 7.27% more than the price in the time of storing.

5.2 Value Addition Activities by Paddy Traders

Paddy traders are the second press 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).

5.2.1 Faria

Faria was the first value chain actor. Number of Faria was very large. Farias took rice from the farmers at farm gate, sometime they collected rice from local bazar and sold to Beparies and rice millers. Generally, Farias have small amount of capital around TK 40,000-2, 50,000 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 ,Local NGO , BRAC bank, Grameen bank, Janata bank and Sonali bank. Interest rate was about 16-17%. Among these, the Grameen bank charged highest interest rate and was found to be at 20 -24%. Monthly average paddy transaction of Farias was about 600.00 quintal on an average. Average distance covered by the Faria for collecting and selling rice was about 15 km on an average. Farias of Fulbariya Upazila purchased rice from fulbariya Bazar, Asim, Otariya, Kandhaniya local market of Fulbariya Upazilla, Muktagacha, Nandina, Priyarpur Haat and Biddagonj hat. Farias added about 6-7% value on their purchased paddy.

Farias, sometimes, added value without incurring any marketing cost. They worked as middleman to transfer the ownership of the business. Most of the time Farias completed their buying and selling at a Haat in the same day. Their net margin varied from 15%-20% more than the Beparis.

5.2.2 Bepari

Beparies were the next actor after Farias. Beparies were the ultimate 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..

There were no Aratdars in the study areas. The main reason was the volume of paddy transaction which was small. Second available reason was the type of the rice mills. Most of the rice mills were husking. Finally, the value chain actors like *Faria* and *Bepari* were able to do business activities comparatively at a low cost than the *Aratdar*. Their average working capital was about Tk. 550,000 and monthly average transaction of paddy was about 135 quintal. The sources of capital of Beparies were same as Faria. But they have taken more loan than Farias and they got the opportunity of geting CC (Cash Credit) loan from the banks. Normally for large amount of credit, they took loan from Grameen bank , Rupali Bank , Sonali Bank , Agrani bank, Janata bank etc.

Farias added about 6-7% value with the paddy they brought from the producers

5.3 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.

5.3.1 Value Addition due to Marketing Cost

Rice millers brought paddy from the farmers, *Farias, Beparies* and also from the commission agents (*Aratdars*). Most of The main marketing items were the cost of transportation, charges paid during paddy transport, loading and unloading, market charge, cost of sack/bag, phone bills, personal expenses, unofficial costs (like donation, tips), etc. Total marketing cost was Tk 76.94 per quintal and added 4.64% value to the paddy price.

5.3.2 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 67.38 per quintal and added 3.80 value to the paddy rice.

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

Items	Tk/quintal	Tk/kg	Value addition (%)
Marketing cost (i)	76.94	0.77	4.64
Milling cost (ii)	67.38	0.65	3.80
Selling cost (iii)	36.73	0.37	2.08
Gross cost (iv)	179.13	1.80	
Purchase price of paddy (v)	1582.99	15.83	
Return from paddy (vi)	2011.79	20.12	
Total return excluding losses (vii)	1992.28	19.92	
Marketing margin (Value addition) (viii)= ((vii)-(v)	409.30	4.10	23.23
Net marketing margin (profit) (ix)=(viii)- (iv)	140.59	1.41	14.54

5.3.3 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 per quintal . Selling cost added 2.08% value with the rice price.

5.3.4 Net Marketing Margin or Profit of Miller

Rice millers added the highest value with paddy and rice. Net marketing margin was Tk 136.09 per quintal and added 42.26% value with the whole process of getting rice from paddy. Total value addition by rice millers was Tk 318.75 per quintal.

5.4 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 Tangail, Bogura, Munshigonj ,Narshingdi, Dinajpur, Jamalpur and Sherpur 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. The average transportation cost of local market rice traders was Tk 18.00 per quintal. Marketing margin or value addition was Tk 175.75 per quintal and added 15.27% value with the rice price (Table 4.12).

CHAPTER VI

THE CONSTRAINTS AND OPPORTUNITIES OF RICE VALUE CHAIN

6.1 Introduction

Most of the farmers were subsistence. Frequent flooding affects farmers and incurred loss from crop damage. Moreover, government services were not available in the study areas. Agricultural extension services were not available during cropping season. Farmers were found to produce some other cash crops like sugarcane and banana for better profit and good marketing opportunities. Traders and millers of the study areas were not aware about the better opportunities of value chain.

Therefore, they could not make desired profit. However, researcher identified some opportunities along with some constraints to improve the rice value chain. Constraints and opportunities are discussed below___

Constraint Element

1. **Technical**
   - Low input farming systems
   - Inadequate technical knowledge of scientific fish farming
   - Poor water quality and fish disease
   - Poor quality of hatchery fry
2. **Social**
   - Multiple ownership of ponds
   - Poisoning of fish farms
   - Poaching of fish
   - Friction between rich and poor farmers
3. **Economic**
   - High production costs
   - Lack of financial support
   - Low market price of fish
   - lack of transparency in the price formation process
   - Inadequate marketing facilities
   - Inequalities in market information

- Inadequate postharvest infrastructure facilities

4. **Environmental**
   - Unplanned conversion of rice fields to ponds
   - Impacts on ice field ecosystem and biodiversity
   - Climate change (Rain,flood, drought)
   - Impacts of excessive use of chemicals and growth

6.2 Constraints in Rice Value Chain

Due to ignorance and unavailability of modern technologies none of the actors in the study areas made 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 per cent respondent farmers claimed that high cost of input materials particularly high cost of Manpower, 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 leading basically based on the previous paddy season and in that time irrigation was not very essential except some exceptional cases. But about 75 per cent farmers mentioned about the problem of interrupted electricity supply during irrigation period. Moreover, diesel price was high, as a result getting timely and enough irrigation were not possible.

d) About 90 per cent 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 famous seed company. Adulterated seed decreased the average yield of rice.

e) Roads and highways were not well improved and also transportation facilities were not well. 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.

f) In the harvesting season supply of rice remains higher than demand which reduced the price of rice. Small farmers had to sell their large portion of paddy for instant cash. So they could not wait for better price in future.

6.2.1.2 Value Adding Barriers

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 complexity procedure of getting credit. About 15 per cent large farmers had access in the bank loan. Krishi Bank was only agricultural credit lending institute in the study areas.

a) Farmers claimed that they had not access in government procurement program. This is why they could not control fair price in the time of harvesting.

b) Most of the farmers were illiterate and unaware of the attack by pests and diseases on their rice. They were not well trained. Over 95 per cent of all farmers reported that the diseases and pest attack adversely affected their paddy production.

c) Rice 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 enough 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 per cent 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.

d) Most of the farmers were not introduced with the value chain activities and its` usefulness. 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. 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.

e) Farmers had to make a distress sale. A large portion of paddy was sold at the harvesting season to meeting up the family expenses and debt repayment.

f) Marketing cost was very high due to high transportation cost.

g) Lack of market information such as price at local and other markets.

6.2.2 Rice Trader

Paddy traders were relatively in better position. *Farias* added value with paddy more than the farmers without taking any risk. Some *Farias* added value without incurring additional marketing cost. 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 brought paddy directly from the markets and also from the farmers. The small traders like *Farias* could not compete with the big traders and also with the rice millers.

b) Bad infrastructure and transportation system increased the transportation cost. Therefore, they could not make decision from where to buy and where to sell.

c) Lack of credit facility.

d) About 85 per cent paddy traders were not informed properly due to their negligence. Moreover as a lag behind area Lack of market information was a barrier for effective value chain in the study areas

6.2.3 Rice Miller

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 problemsR ice millers were the main actors in the rice value chain system. Millers added the maximum value in rice marketing. Rice millers could add extra value in three ways. Firstly they brought rice thus, added the marketing costs. Then rice was husked in the mills and in this step milling costs were added with the rice. Finally, rice and bi-products were sold thus, selling costs added to rice.The problems were as follows:

1. Rapid transfer of 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.

2. Lack of electricity supply compelled the millers to use high cost fuel. Thus their price increased but output price do not increase as per cost. About 100% rice millers of both Fulbaria and muktagacha upazilas claimed that at least 7-9 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 price of milling increased but rice price could not be found.

3. About 7% rice millers reported that they had to face difficulties due to shortage of paddy in the local markets. In 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.

4. Transportation system and infrastructure were not improved. So rice purchasing and rice selling cost both were higher than other regions of the country.

5. Paddy could not be stored for long time due to uncertainty of better price in future. Moreover lackage of fund for storing rice millers could not store large scale paddy.

6. Small rice millers reported that they could not enter into government rice procurement program.

6.2.4 Rice Trader

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

a) Transportation price was very high because transportation system was not developed. But it was observed that roads were being changed. According to the report of rice traders when all the roads will be repaired transportation cost will reduce about 12%-17% 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%-15% rice price fluctuate. For this cause rice traders could not store it for long time.

c) Demand for rice was more or less same in a specific market. About 85% traders mentioned that their everyday sales varied by 9% only. So traders couldn't increase scale of selling at any period.

d) Almost 100% traders reported about market risk. They had little support in case of any uncertain situation e.g. enough supply of rice due to strike, natural calamities etc. Insufficient credit facilities were available. Therefore, traders couldn't increase their business activities.

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.

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 90 per cent annually.

6.2.5 Climate change

Atmospheric CO2, CH_4, SO_2, N_2O, etc. are mainly responsible for temperature Increase resulting in the rise of sea level. Temperature rise by 10^0 C would inundate 18% area of Bangladesh as indicated by different studies. At the same time, the country is affected frequently by flood, drought, cyclone, and salinity due to climate change. As a result, soil fertility, crop productivity, and food security would be seriously threatened. Climate change has also accelerated hunger, poverty, malnutrition and incidence of diseases, especially in developing countries (IPCC, 2007). It is basically the poor that would be worst victims of climate change. Profit driven mode of production by corporate agencies and their over extraction and consumption of fossil fuels (coal, oil) has also hastened global warming.

In Bangladesh, about 1 million ha of the coastal region is saline. But very few varieties are available for combating salinity. Drought affects annually 2.5 million ha in *kharif* and 1.2 million ha in dry season. Kharif drought affects T. *aman* rice severely. Besides, about 2.6 m ha are affected by flood in a normal year (Z. Karim, 1997). The devastating flood of 2004 inundated 40 districts and caused considerable loss of crops and human life. But very limited technologies are available that are tolerant to flood and drought.

According to Intergovernmental Panel on Climate Change (IPCC, 2007), coastal area of Bangladesh may go under saline water by 2050. Due to the rise in temperature, crop production will be reduced by about 30%. Climate change, especially temperature rise would decrease the yield of *boro* rice by 55-62% and wheat by 61% by 2050 in Bangladesh (New Age, 2008). Frequent felling of green trees by the influentials, especially in coastal belts for building shipyards has also become a threat to climate change.

6.2.6 Inefficient water use

Water use efficiency in Bangladesh is extremely low. On the average, 25-30% of irrigation water is used by crops and the rest is lost due to faulty flood irrigation system (Z. Karim, 1997; M. Mondal, 2005). Conservation of rain water during monsoon is virtually non-existent that could be utilized for irrigating crops during dry

season. Studies show that irrigation with surface water instead of underground water might reduce the vulnerability to hazards of climate change. Irrigation cost in Bangladesh is relatively high due mainly to high price of diesel. It is to be mentioned that more than 80% irrigation pumps in the country are diesel operated.

6.2.7 Pests and diseases

The use of fertilizers, quality seeds, and irrigation together can not ensure sustainable production unless timely and appropriate measures for the management of pests and diseases are simultaneously pursued. It is important to note that the incidence of diseases and pests has lately become very severe due to the adverse effects of climate change, particularly rise in temperature (IPCC, 2007). It is estimated that 4-14% of rice yield in Bangladesh is lost every year by different insect pests. Bacterial Leaf Blight (BLB) and nematode (ufra) are now the serious diseases in rice. But the technologies resistant to pests and diseases are still very limited. Use of 1PM technology is limited to rice and few vegetables.

6.2.8 Inadequate credit support to farmers

About 90% farmers of Bangladesh are small and marginal (below 2.5 acres). They are very often constrained by finance and thus cannot afford high cost for management. They have very limited access to institutional credit because of collateral requirement. At present, only 27% of farmers receive institutional credit (BBS, 2007). The credit amount again is quite inadequate and not advanced in time. They are also not eligible for microcredit of NGOs that deal mainly with landless farmers. The situation compels these farmers to apply inputs, especially expensive P and K fertilizers far below the recommended doses that finally result in low yield.

6.3 Opportunities

Some opportunities were also identified. If the value chain actors were well financed they could store their product for better price in future. Storing paddy and rice could ensure availability of rice and reduce price risk. Modern technologies could reduce the cost of production thus; marketing margin would increase, so transportation system has to be improved 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 infrastructure were being developed gradually by government.

6.3.1 Population control

To arrest population growth, family planning services should be geared through field level workers and NGOs to reach all households across the country. More number of field workers needs to be deputed to provide such services. It is also necessary to produce enough birth control materials within the country to reduce dependence on import. The materials should be supplied in time to the field workers as per their requirement. It is heartening to note that the government is reactivating the family planning programme under "Strengthening Target-oriented Family Planning Project". Ministries of Health & Family Welfare and Finance are made responsible for implementing the project in line with the election pledge of the government.

It is highly imperative that the twin problem of arable land loss and population growth are addressed by the government simultaneously without any further delay to ensure increased and sustained production and thereby food security. Both the issues need to be categorically spelled out in the new National Agricultural Policy (NAP) under preparation by the Ministry of Agriculture.

6.3.2 Adaptation/mitigation to climate change

Bangladesh Rice Research Institute (BRRI) has developed BRRI dhan 40, 41, and 47 that are salt tolerant. The varieties should be introduced and disseminated in the area after necessary testing. More heat tolerant varieties of wheat need to be developed. CIMMYT and BARI may be urged to develop tropicalized wheat varieties. It is also necessary to use biotechnology or gene transfer technology to develop varieties tolerant to salinity, flood, and drought. There is also a need to develop HYVs in pulses, oilseeds, spices, and fruits since improved technologies in these areas are few. Country does not have its own supply of hybrid varieties of rice, vegetables, and other crops. In the circumstances, the government should urge BRRI, BARI, and other NARS institutes and private companies & NGOs to develop their own hybrid variety programmes of these crops within the country. Climate change is a development issue

and therefore, the change must be integrated into national development plan of the government. Besides, political commitment must be ensured to mitigate the problems– flood, sea level rise, and salinity intrusion of agricultural land in particular. It is emphasized that mitigation measures rather than adaptation practices may be considered as better solutions to the problem. Mitigation measures include the use of renewable energy, reduction, and efficiency in the use of fossil fuels, afforestation, early warning system to disaster management, preventing felling of green trees, especially in coastal areas, etc.

The Government of Bangladesh is yet to make an estimate on resources required to overcome climate change impacts. However, to implement "Climate Change Strategy and Action Plan 2009", Ministry of Agriculture has recently estimated a demand of $5 billion to address the problem for the next 5 years. Success of the plan largely depends on the commitment of the government since its implementation is dependent on several ministries. It is also extremely important that both Poverty Reduction Strategy Paper (PRSP-II) and Sixth Five-year Plan under formulation contain clear provisions to address the issue.

6.3.3 Fertilizer management

To encourage the use of balanced fertilizers, chemical fertilizers must be integrated with organic manures and subsidy benefit on non-urea fertilizers should continue. Farmers should gradually reduce their dependence on the use of chemical fertilizers to maintain soil fertility. It is essential that the government clearly spells out the need for balanced fertilizers in its new NAP in the interest of sustainable crop production. International Federation of Organic Agricultural Movement (IFOAM) has been in operation in 92 countries of the world including S. Korea, China, and Taiwan. Under the Movement, there are at present 527 members. Major objective of IFOAM is to create awareness among farmers about the need of organic matter in increasing soil fertility and crop productivity. It is proposed that Bangladesh becomes a member of IFOAM to motivate farmers to use organic fertilizers. It may be noted that the Prime Minister herself has laid emphasis on the increased use of compost fertilizers to boost crop production while the President of International Fertilizer Development Centre (IFDC) made a courtesy call on her recently.

6.3.4 Water management

For efficient use of water, irrigation should be applied at the appropriate growth stages of crops. Growing crops under minimum tillage, relay cropping and mixed cropping practices may also be strengthened for rain fed cropping. Farmers may be motivated to grow low- water requiring crops like pulses, wheat, etc. Different NGOs may as well be used to excavate derelict ponds, canals, etc. for the conservation of rain water for irrigation in dry seasons. It may be noted that there are a number of derelict ponds in briand and other areas of the country. Rain water thus saved could be used for surface irrigation. Diesel price should be substantially cut to reduce irrigation cost or subsidized in the interest of resource poor small and marginal farmers.

6.3.5 Pests management

More resistant varieties should be developed using both conventional breeding and biotechnology to control the pests. It is also necessary to expand biotechnology and 1PM practice to other economic crops, such as oilseeds, pulses, spices, and fruits. The new NAP should as well emphasize the importance of the use of these environment-friendly frontier technologies. Recently, BARI has developed sex pheromone trap technology for the control of shoot and fruit borer in brinjals and cucurbits (S. Alam, 2008). To control bacterial wilt in brinjals, grafting technology on wild solanum has been also evolved by BARI (Ann. Rept, BARC, 2007-08). Attempts should now be made to transfer the technologies at field level.

6.3.6 Fair price of produces

Government is urged to procure the produces directly from the farmers raising the present ceiling to at least 10% of the total production. Storage faculties may at the same time be established in rural areas following the experience of SHOGORIP that is likely to allow the farmers to store their produces and sell the same at better prices when the demand is high.

6.4 Conclusions

Value chain actors in the study areas were not concerned about the value chain activities but the study found 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 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 byproducts. 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 Fulbaria and Muktagacha upazilas of Mymensingh district.

Farmers were the first value adding actors who produced paddy and supplied it to the markets. They hardly covered their cost of production. Farmers of the study area faced different problems. Therefore, the average rice production was not very satisfactory. Frequent flooding affected rice production in the study areas. About 65- 70% of the farmers in the western areas of both upazilas near the Brahmaputra river mentioned the problem of early flood almost every year. Besides, some problems were unavailability of input, lack of power supply for irrigation, high cost of inputs, lack of modern technology, and unavailability of timely credit.

Among all the value adding actors, farmers obtain the lowest share. Farmers added value through different activities e.g. cleaning paddy, drying, storing, marketing in different time and in various markets and by processing (like seed, rice, etc.). After meeting the family needs, some farmers reserved the paddy for selling when the prices went-up. On an average paddy was stored for three months. By drying paddy farmers added about Tk 100.50/quintal. Farmers could add Tk 100.00/ 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 7.92%, 7.27% and 6.67%, respectively. That means on an average farmers add 7.29% 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 Fulbaria and Muktagacha upazila and supplied to the rice millers in the same areas. Major part of paddy was assembled for selling in local markets named Azim bazaar, Muktagacha haat, Biddagonj Haat, Nandina haat, Boradoba haat etc. On top of that,

some large rice millers collected paddy from Bogura , Tangail , Jamalpur, Dinajpur, Rangpur, Naogaon, Bokshigonj, Munshigonj, Narshingdi district etc.

Like farmers, the paddy traders were involved with various activities such as packaging, grading, sorting, storing, drying etc. Paddy traders collected paddy from the farmers and supplied to other large traders or the millers. Unofficial expense,taxs, Transportation cost, loading, unloading etc. were the value adding activities of paddy traders.

Moreover, a large number of people were engaged 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 improved. The findings of the study publish that the producers could not control expected net margin due to high cost of production, high cost of manpower, high cost of agricultural input and low output price. Most of the production was consumed by the farmers. Some large farmers reserved 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 and other unofficial uses.

Like the whole Bangladesh the production of rice in the study areas was very affected by post-harvest problems such as Temperature, Rain, Favorable environment, Unavailability of storage, price fluctuation; demand for rice etc. Rapid fluctuation of rice price was identified. Rice millers were not interested to expand their business because of some constrain. Lack of electricity and labour shortage and high labour wage were the main problems.

There were some opportunities to develop the rice value chain. The opportunities of the value chain were given below ___

I. Enhancing different ways for government involvement when clear issues were identified;
II. Establishing an organized and effective sector environment;
III. Improving buyer confidence.

Recommendation

• It is essential to review the present land use policy with the relevant experts, professionals, and farmer's representatives and update it based on their suggestions. The policy should be enacted and put into operation immediately to stop further loss of arable land. Khas lands that are arable should not be diverted for housing.

• It is highly imperative that the twin lackings of arable land loss and population growth is addressed by the government simultaneously to ensure production sustainability and food security. Both the issues need to be categorically spelled out in the new National Agricultural Policy (NAP) under preparation by the Ministry of Agriculture.

• Strong political commitment must be ensured to implement the present "Climate Change Strategy and Action Plan". It is also extremely important that both Poverty Reduction Strategy Paper (PRSP-II) and seventh Fiver-Year Plan under preparation contain clear provisions to address the issue.

• To encourage the use of balanced fertilizers, chemical fertilizers must be integrated with organic manures. The government should clearly spell out the need for balanced fertilizers in its new NAP in the interest of sustainable production. Farmers should as well be motivated to reduce their dependence on the use of chemical fertilizers to maintain soil fertility.

• It is also necessary to expand biotechnology and 1PM practice to other economic crops, such as oilseeds, pulses, spices, and fruits for the management of pests and diseases. The new NAP should emphasize the importance of the use of these environment-friendly frontier technologies in pest management.

- Irrigation should be applied at the appropriate growth stages of crops for efficient use of water. Growing crops under minimum tillage, relay cropping and mixed cropping practices may also be strengthened for rain fed farming. Farmers may be motivated to grow low-water requiring crops like pulses, wheat, etc. Different NGOs may as well be used to excavate derelict ponds, canals, etc. for the conservation of rain water for irrigation in dry seasons.

- Farmers' low quality seeds still meet about 95% seed requirement. For quality seed production, they should be given massive training on seed production, preservation, and processing. It is also important to support them through credit supply on easy terms and at low interest rate.

- A new institution/foundation following the model of Palli Karmo Sahayak Foundation (PKSF) should be established along with necessary manpower and other facilities to cater to the needs of resource-poor marginal and small farmers. The institution must have an in-built provision for strong monitoring unit to monitor the use of credit at regular intervals.

- The government should urge BINA BRRI, BARI, and other NARS institutes, private companies and NGOs to develop their own hybrid variety programmes of rice, vegetables and other crops within the country.

- Storage facilities may be established in rural areas following the experience of SHOGORIP that may allow farmers to store their produces and sell the same at better prices. Alternatively, the government might encourage to establish farmers' cooperatives to ensure fair price of their produces. The cooperatives should not, however, be run as a commercial profit-making entity.

- Since investment in agricultural research is highly rewarding and beneficial, the government should raise the investment to at least 2% of GDP as recommended by World Bank and FAO. The investment will certainly encourage scientists to develop technologies to cope with the hazards of climate change.

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Appendix

DEPARTMENT OF AGRIBUSINESS AND MARKETING

SHER-E-BANGLA AGRICULTURAL UNIVERSITY

An Interview Schedule on

Opportunity and Challenges of Rice supply chain in the Selected Area of Mymensingh District

Sample No:

Village:

Union:

Upazila:

District:

a. Socio-economic charecteristics:

Respondent name	Age	Education (Years)	Experience	Occupation	Societal Membership (Yes/no)
1. Farmer					
2. Paddy Trader					
3. Rice Miller					
4. Rice Trader					

b. Total family members:
Male:
Female:
Total Members:

c. Materials inputs used:

Cost Items	**Tk/acre**	**Tk/quintal**
Land preparation		
Seed bed		
Transplantation of seedling		
Weeding		
Irrigation		
Fertilizer application		
Harvesting		
Threshing, winnowing		
Power tiller/ draft power		
Seed/Seedlings		
Fertilizer and manure cost		
Insecticides		
Irrigation		
Rental value of land		
Total cost of production		

d. Costs and Returns of Paddy Farmers

	Particulars	Total value (Tk./ acre)	Cost or Return (Tk./quintal)
Variable costs	Human labour (Man-day)		
	Land preparation (Power tiller or draft power)		
	Seed/seedlings (Kg)		
	Fertilizer and Insecticide		
	Irrigation		
	Total variable costs (TVC)		
Fixd costs	Rental value of land(per paddy season)		
	Total fixed cost (TFC)		
	Gross cost (GC=TVC+TFC)		
Return and margin	Paddy (quintal)		
	Straw (1 aati=3kg)		
	Gross return (GR) xii = x + xi		
	Gross margin (GM) xiii = xii – vi		
	Net margin (xiv = xii – ix)		

e. Marketing Costs, Margins and Value Addition of Paddy Traders

Items		**(Tk. /quintal)**
Purchase price of paddy		
Sells price of paddy		
Marketing cost	Variable cost	
	Fixed cost	
	Total	
Value addition (marketing margin)		
Gross margin		
Net margin		

f. Costs and Margins (Value Addition) of Rice Millers

Items		**Tk. /quintal**	
Purchasing cost of paddy (i)	Variable cost		
	Fixed cost		
Milling cost of paddy (ii)			
Selling cost of rice (iii)			
Gross cost (iv)=(i)+(ii)+(iii)			
Purchase price of paddy (v)			
Return from paddy (vi)			
Weight loss (vii)			
Total return excluding losses (viii)=(vi)-(vii)			
Marketing margin (value addition (ix)=(iv)+(x)			
Net marketing margin ((x)			

g. Cost, Return, Margin and Value Addition of Rice by Rice Traders

	Items	**Tk. /Quintal**
Marketing cost	Transportation	
	Loading and unloading	
	Bag/Sac	
	Market toll (Security charge)	
	Weighing	
	Personal expenses	
	Rent for shop	
	Un-official cost	
	Electricity	
Total cost	Total variable cost	
	Total fixed cost	
	Total marketing cost	
Margin	Purchasing price of rice	
	Selling price	
	Marketing margin (value addition)	
	Value addition %	
	Gross margin	
	Net marketing margin	

h. Please mention the problem faced by regarding rice supply chain.

i.

ii.

iii.

iv.

i. What are the suggestions to overcome the above Problems?

1.
2.
3.

Thank you for your kind co-operation.

Date: …….

Signature of the interviewer