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Original Article

Functioning of Rice Bran Market in Kishoreganj District, Bangladesh: Focused on Market Structure, Conduct and Performance

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A B S T R A C T

The commercial rice bran industry in Bangladesh has experienced remarkable growth in the last decade and it continues to grow. However, lack of a well-coordinated marketing system of agriculture products remains a major constraint in further development of the industry. The focus of the study, therefore, was to assess the structure, conduct and performance of the rice bran market in Kishoreganj district in order to elucidate the performance of the marketing system before any interventions are made to change the existing conditions. The data for the study was sourced from both primary and secondary sources. The study employed descriptive statistics and Gini coefficient to determine the degree of rice bran market concentration in the study area. The gross margin, marketing margin and marketing efficiency was used to measure the performance of the rice bran market in Kishoreganj district. The results of the study showed that the Gini coefficient was 0.495 and 0.493 for wholesalers and retailers respectively, indicating a highly concentrated market hence an oligopoly market structure. The conduct of the market participants, which reflects the behavior of the firms or the decision that firms make relating to their pricing and output policy and other competitive practices, revealed that among rice miller, the two forms of terms of sale were contract selling 10 percent and spot market selling 90 percent. Further, the study found that rice miller attained the highest gross margin of TK 191,000 followed by wholesalers and retailers with TK 10,300 and TK 3,100 respectively. The marketing margin revealed that retailers attained the highest marketing margin of 11 percent while wholesalers had 10 percent. In conclusion, rice bran production and trading in Kishoreganj district is profitable but not to a satisfactory state due to lack of collusive behavior among market participants and availability of market information. The study, therefore, recommends that the Government of Bangladesh should integrated agricultural marketing information system which is linked to rice millers, wholesalers, retailers and final farmers in order to avoid exploitation of high prices.

Introduction

Food security has been and will remain a major concern for Bangladesh. Rice is not only the foremost staple food, but it also provides nearly 40% of total national employment (48% of total rural employment), about two-thirds of total calorie supply and about one-half of the total protein intake of an average person in the country (BER, 2020). Most people live in rural areas where production is the single most important determinant of the consumption of cereals. For the economy as a whole, 26% of household expenditures are spent on rice: however, the poorest 40% of household in both rural and urban Bangladesh spend 38% on rice (Chowdhury, 1998). Rice is one of the world's most important food crops and more than half of the people in the world eat rice as the main part of their diets. Bangladesh is one of the world's top rice-consuming countries.

Rice bran is a good source of protein and fat, is at present underutilized as a food material. The presence of enzyme lipase in rice bran causes rapid deterioration of oil to free fatty acids and glycerol. Rice bran is one of the main byproducts in the process of the rice milling. Multiple forms of rice bran lipase have been identified. Available lysine contents of protein concentrates ranged from 54 to 58.8 percent (Prakash, 1996). The essential amino acid profiles of protein concentrates indicate that threonine and isoleucine are limiting amino acids. Rice bran has been used in food as full-fat rice bran oil and protein concentrates. Full-fat and defatted rice bran have been used in bakery products, breakfast cereals, wafers as a protein supplement, binder ingredients for meats and sausages and as a beverage base (Prakash, 1996). The complete exploitation of its potential has not been realized due to problems associated with rancidity. Therefore, rice bran is mainly used as livestock feed or boiler fuel and only a small amount is applied to extraction and preparation rice bran oil (Webber *et al.*, 2014). Figure 1 shows the demand and production of rice bran of Bangladesh. As shown in the figure, the demand for rice bran increased from 11 MT in 2014 to 18 MT in 2020 and the annual rice bran production increased from 8 MT in 2014 to 15 MT in 2020.

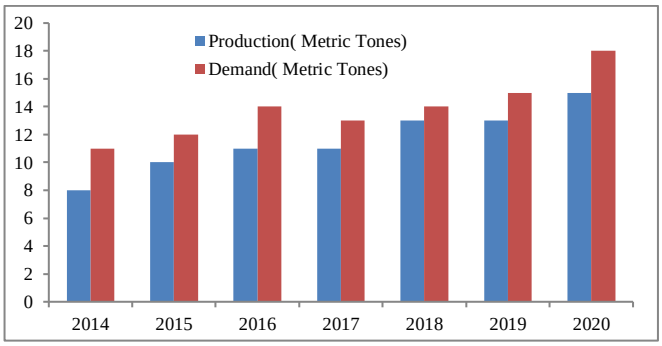

Figure 1. Annual rice bran production and demand trends (2013-2020).
Source: Bangladesh Bureau of Statistics (2020)

Agricultural markets provide an important mechanism for efficient coordinated economic exchange (Dorosh and kydd, 2005). The well-functioning of the rice bran marketing system depends on its organizational structure and how efficient the marketing channels are in moving rice bran from farm-gate to final consumers at prices that ensure fair returns to all market participants. Structure analysis is the key to understanding how to the market in Kishoreganj district functions in terms of its structure and the behavior of the market participants based on the type of market structure they are exposed to. However, there is a little empirical information on the structural organization of the rice bran market.

Though millions of farmers produce paddy in Bangladesh, but hundreds of large rice millers in different part of countries often significantly control the supply of rice/ rice bran to the markets. There might be a number of reasons as to why only a few farms supply more rice/ rice bran in the country. For example, the reasons may be that government licenses only few farms in an industry or that the cost of trading agricultural products is very high and prohibitive, resulting in barriers for new entrants into the market. These few farms controlling the supply of rice bran may decide to collude and sell their products at a high price or price discriminate which may result in an uncompetitive market. The other reason could be that these farms are more efficient than the rest of the farms in the market and because of their low-cost structure they can afford to lower their prices hence attain a larger market share. Analysis of the structure, conduct and performance of the rice bran market gives insight into what is happening in the market and provides an explanation of the current market situation in Kishoreganj district.

Past studies on rice bran in Kishoreganj have mainly focused on production trends and productivity enhancement (Madisa *et al.* 2010). There is limited information regarding the rice bran market in the Kishoreganj generally and particularly how specific aspects of the market (such as market concentration, market share, the nature of competition and behavior of market participants affect the performance of the market. The information gap can be addressed by analyzing the market structure of rice bran market in Kishoreganj district, hence the current study.

2. Methodology

The study is based on the theory of industrial organization which states that there is a causal link between the structure of a market in which a firm operates, the organization's conduct and in turn the organization's performance in terms of profitability (Ramsey, 2001). The theory is captured in the SCP model first developed by Joe S. Bain. The model explores the relationship between market structure, conduct and performance the effects of internal and external factors on all three. The dynamic approach suggested that the relationship among structure, conduct and performance is not only unidirectional but also flows both ways.

2.1 Study area and sampling technique

The study was conducted in Kishoreganj district covers 2,689 square Kilometers with a population of 3,028,706 people in 2011 census (BBS, 2011). The stratified random sampling technique was used by structuring the population into various strata to ensure fair representation of the different types of market participants. The stratification involved three homogeneous groups of rice miller, wholesaler and retailers. The proportional sampling method was used to select a specific number of respondents from reach group based on their proportion in the marketplace.

The rice miller sampled for the study included those who have been commercially producing rice bran production for at least five years. The proportion of the rice miller in the market was 60 percent giving sample size of 20. Therefore, rice miller was randomly selected. Out of the extension areas on the study area, purposive sampling based on areas with the largest number of rice miller and traders was employed to select five extension areas. These are Kishoreganj sadar, Karimganj, Itna, Mitaimon and Nikli. From each of the five selected extension areas, 4 rice miller were randomly selected in order to come up with a total of 20 rice miller in the study area.

Wholesalers included in the study area comprised of those who bought rice bran from the rice miler in order to resell it to the in the market. Wholesalers selected for the study who have been in operation for at least five years. The proportion of the wholesaler in the market was 20 percent therefore the selected sample size for wholesalers was 15. From each of the five randomly selected extension areas, three wholesalers were randomly selected in order to come up with a total of 15 wholesalers. The sample size for the retailers was fifteen

respondents. These respondents comprised of respondents who bought rice bran from wholesalers in order to sell to farmers, with a minimum operation period of five years.

2.2 Data

The study sourced the relevant data regarding the number of actors in the market from the rice production report of 2019. The Agricultural Extension Officer in the Kishoreganj provided information on the current market condition in the study area. The study used both primary and secondary data. Primary data was gathered using two types of structured questionnaire, for rice miller and traders. The questionnaire had sections on demographic characteristics of respondents as well as production and marketing information such as quantity of rice bran traded by rice miller, quantity of rice bran traded by wholesalers and traders pricing availability of price information and access to market. The questionnaire traded rice miller and traders who had been active for five years or more.

2.3 Analytical Techniques

Assessing market structure

The concentration ratio the Gini coefficient was used to measure the degree of market concentration. The Gini coefficient was calculated following Tiku *et al.* (2012):

$$G=1-xy$$

Where G is the Gini coefficient, x is proportion of sellers and y is cumulative proportion of sales. In calculating the proportion of sellers (x), the quantity of rice bran traded was categorized into different categories as proposed by Tiku *et al.* (2012), from the smallest quantity traded to the largest. In each of the category the specific number of traders who traded in that amount was recorded then divided by the total number of the interviewed traders.

In order to obtain cumulative proportion of sales (y) from the different categories created, the total yearly sales for the particular category were calculated and weighed in terms of the total yearly sales of all the categories. Then the cumulative proportion was determined. The Gini coefficient lies between 0 and 1 with values closer to 0 indicating perfect equality of market participants and those closer to 1 indicating inequality among the market participants (Tiku *et al.*, 2012).

Assessing market conduct

The conduct of market participants was determined using the following variables: (i) degree of price collusion, (ii) buying and selling practices, (iii) differentiating products and (iv) advertising and sales promotion strategies. The degree of collusion was determined by evaluating whether there are coordinated restrictions of products, in this case rice bran, in the market, thereby raising market prices. Collusion may also be observed where firms from trade associations in order to control the market by fixing prices or lowering them in order to wade off new entrants into the market, therefore resulting in uncompetitive practices in the market.

The different buying and selling practices in the market were also observed. In an uncompetitive market, prices of products may not be transparent or openly displayed and traders may charge different prices to different firms or individuals for the same product. The study also determined whether market participants differentiate their rice bran in any way in order to distinguish it and make it more attractive to the market. The product may be differentiated in variety, advertising, packaging. In a competitive market, products sold in the market usually identical while in a monopoly structure, product are differentiated or unique to the firm.

Assessing market performance

In order to assess performance of the market, the gross margin, marketing margin and marketing efficiency were calculated for each market player- rice miller, wholesalers and retailers. Rice miller share of the final price was employed to determine if the rice miller get a fair share of the farmer spending on rice bran.

Gross margin analysis

The gross margin is a tool that is used to assess the financial profitability of an enterprise. It is calculated as the difference between the gross income accrued and the variable costs incurred by an enterprise (Zorinah, 2016). Gross margin is calculated using the formula as:

$$GM = TR-VC$$

Where, GM is the gross margin of either rice miller or traders, TR is the revenue from the sale of rice bran and VC is the variable costs incurred. Gross margin analysis was used to identify which market participant accrues more returns and whether they pursue their economic activities sustainably.

Analysis of marketing margin (MM)

The marketing margin is the difference between prices at two different points in a marketing channel (Smith, 1992). The total gross marketing margin was computed using the following formula:

$$TGMM = (SP-BP/SP) *100$$

Where TGMM is the total gross marketing margin, SP is the selling price of rice bran by a trader in TK/maund (*1 Maund = 40 Kg.*) and BP is the buying price of rice bran by trader in TK/maund. The marketing margin indicates how much has been paid for processing and the marketing services applied to the product at that particular stage in the marketing process. It refers to the charge which firms make for providing marketing services. An uncompetitive market is the usually characterized by high marketing margin given the fact that rice bran does not require much processing. This is reflected by a huge difference between farm-gate and retail prices, which indicates an inefficient market.

Marketing efficiency analysis

The marketing efficiency criterion was used to analyze how efficient the marketing system is in the rice bran industry in the central district of Kishoreganj. The marketing efficiency was computed using the formula adopted from Haruna *et al.* (2012) as follows:

$$ME = (Revenue/marketing\ cost) *100$$

The marketing efficiency estimates the financial marketing feasibility of execution any additional services and a positive signed estimate would justify application of such services and a negative estimate will indicate otherwise.

3. Results and Discussion

3.1 Experiences, cooperative societies and star-up capital of rice miller

Experience in rice bran production

The minimum number of years the respondents have been in rice bran production was a year while the maximum number of years in production was 30 years. The mean number of years in rice bran production by miller was 17.7 years. The results show that most of the rice miller in Kishoreganj

district have sufficient experiences of producing and selling rice bran. This is explained by the observation that the most dominant type of arable agriculture has been that of cereal production has not been a very common practice among farmers in Kishoreganj until after the government restructured support towards commercial agriculture (Seleka, 1999). Public support for improvement of rice bran production has been shown by introduction farm level financial incentive schemes that included Financial Assistance Policy (FAP).

Cooperative societies for rice miller

In a market setup, cooperatives tend to influence how the market performs by influencing the conduct of the market participants. Market cooperatives and social groups tend to exhibit collusive behavior in terms of market and pricing policies pursued by the actors and the way they coordinate their decisions (Staatz, 1983). This collusive behavior is characterized by firms or individuals coming together and agreeing to fix output quotas, set prices and avoid competitive pressures, as a way of increasing profits, leading to higher prices in the market.

The results of the study show that majority of the rice miller did not belong to any cooperatives. A total of 55 percent of the miller did not belong to cooperative while 45 percent of the miller belonged to cooperatives. Furthermore, among the respondents who belonged to cooperatives and social groups, 48 percent of them stated that the reason for being in the cooperative was because of advocacy by the group in government support program and the agricultural council. A total of 34 percent of the respondents stated that they were in cooperatives in order to get production and marketing advice while remaining 18 percent were for credit and savings support. Form the results of the study, it shows that cooperatives were not actively involved in the marketing of rice bran by rice millers in terms of dissemination of price information and collective sale of rice bran. Seleka (1999) reported a reduction in the participation and popularity of agricultural cooperatives and that most of the emphasis of the cooperatives was based on providing credit and savings services.

Start-up capital for rice miller

In analyzing the structure, conduct and performance of a market, the amount of the start-up capital is an indicator as to whether it is easier to get into the business of rice bran production and marketing or not. An average amount of Tk. 205,417 was needed to start a rice bran enterprise, with a minimum amount of TK. 250,00 and a maximum of TK. 400,000. The most common source of the start-up capital was from personal savings (55 percent), followed by credit from the bank (20 percent), then loan from relatives and friends (25 percent). Among the respondents who acquired credit from the bank, 100 percent of them were males. This could be explained by the fact that males are the most dominant group of rice millers in study area.

The amount of start-up capital required to grow and sell rice bran is considered to be moderately high considering the fact most of the source is from personal savings. The interviewed rice miller noted that it takes long to acquire from banks and the loans usually come with high interest rates. The high start-up capital and high interest rates may act as a barrier to entry into the production and marketing of rice bran. Moepeng (2013) stated that high start-up costs are one of the barriers impeding the growth of the agricultural sector in Kishoreganj District, as it hinders new entry into the business for rice bran production and marketing. Among other constraints faced by rice millers were high input costs, high utility costs and shortage of labour.

3.2 Experiences, trade association and star-up capital of traders

Experience in rice bran trading

When experience and knowledge are combined, there is momentum for progress and a greater chance of achieving the desired objectives (Rajagopal, 1986). Wholesalers and retailers had a mean of 6.5 and 6.75 years of experience in rice bran trading respectively. The years of experience in rice bran trading ranged from 12 to 35 years for wholesalers and 8 to 35 years for retailers. From the results, it is apparent that men had more experience in rice bran trading than women, with 100 percent of men with more than 5-year experience. The results could be explained by the fact that rice bran trading is still at its infancy stage.

Social and trade association groups

Social and trade associations in this context refer to those organizations that create a means for firms and individuals in the agricultural industry to interact to mutual benefit of all who are involved. They are usually funded by the members firms themselves and are commonly used as a platform for a unified voice either to influence the market or lobby on matters of legislation that are anticipated to have an impact on the industry (Tirole, 1988).

From the results, only 40 percent of wholesalers belonged to social and trade associations while only 46.7 percent of retailers belonged to social and trade associations. Among the wholesalers who belonged to social and trade associations, 16.7 percent of them female and among the retailers who belonged to social and trade associations, 28.6 percent of them female. This could be explained by the fact that women tend to be vulnerable to malpractices and cheating behavior which may limit access to markets, especially in the agricultural trading business, so social and trade associations may act as a form of security and service delivery.

The prevalence of social and trade associations, however, may lead to collusive behavior in an industry. This may be done through agreements among sellers to raise or fix prices and to reduce output in order to increase profits. It is evident from the results that members of the trade associations do not coordinate any purchasing or selling activities and every trader prices their commodity looking at prevailing prices in the markets and their marginal costs. The respondents who reported to be members of the associations stated the advantages derived from such groups as credit access (wholesalers= 17.1 percent, retailers = 15 percent), credibility (wholesalers= 47.1 percent, retailers= 37.5 percent), to get market information (wholesalers= 8 percent, retailers= 10 percent) and encouragement to save (wholesalers= 28.6 percent, retailers= 32.5 percent). The above results rule out the possibility of collusion among market participants.

Start-up capital

The average start-up capital for wholesalers was TK. 197,133.33 and for retailers was TK. 52,000. Wholesalers' start-up capital was higher than that of retailers because 40 percent of the wholesalers indicated that they had to purchase small track before proceeding with the wholesaling

activity. The source of the start-up capital for retailers was bank loan 20 percent, own savings 66.7 percent and loan from trade association 13.3 percent. The source of the start-up capital for wholesalers was bank loan 26.7 percent and own savings 73.3 percent. The current study revealed that the wholesaling activity requires more start-up capital than retailing. This may be due to the fact for most of the retailers, there are those organized market areas where they can sell their rice bran and pay a minimum governmental levy of not more than TK. 20. Wholesalers are the ones who acquire rice bran from the rice millers and distributes it among retailers.

3.3 Rice bran marketing channel

According to Molynex (1995), marketing channel refers to the sequence of intermediaries through which products pass from the rice miller to farmers. Marketing channels provide a systematic knowledge of the flow of the goods and services from their origin (rice miller) to the final destination (farmers) (Figure 1). There were different channels in which rice bran passed from rice miller to the farmers. The channels consisted of rice miller from the Kishoreganj District who produce rice bran, wholesalers who purchase from rice miller at the farm-gate and retailers who purchase rice bran from wholesalers. The rice miller-wholesalers-retailers channel is the most common channel for agricultural product and the intermediaries between rice miller and farmers reduce the amount of work that have been done by rice miller, such as grading, sorting, packaging (Mahoo, 2011).

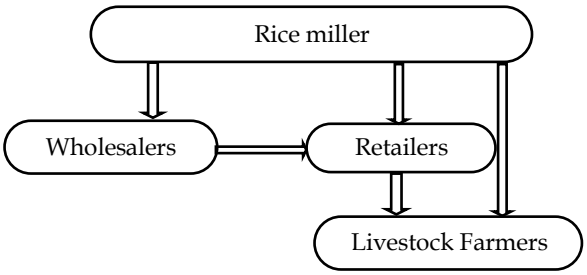

Figure 2. The rice bran marketing channel in Kishoreganj District.

3.4 Market Structure

Market concentration among wholesalers

The average quantity of rice bran traded was 320 maund of rice bran per month. Majority of wholesalers sold between 250 to 500 maund rice bran in a month. The average rice bran sales in a month by wholesalers amounted to TK.151266.7. The Gini coefficient for wholesalers was 0.495 (Table 1) implying that the market for wholesalers was relatively highly concentrated and therefore less competitive. The results differ with those of Zorinah (2016) showed that the Gini coefficient was 0.672 and 0.509 for wholesalers indicating a highly concentrated market hence an oligopoly market structure.

Table 1. Gini coefficient for wholesalers in Kishoreganj District.

Quantity Sold (Maund)	Number of Traders	Proportion of Traders	Cumulative % (X)	Total Monthly Sales (TK)	Proportion Total Monthly Sales (TK)	Cumulative % (Y)	XY
100-150	1	0.067	0.067	40000	0.019	0.019	
151-200	2	0.133	0.2	160000	0.077	0.096	
201-250	1	0.067	0.267	100000	0.048	0.144	
251-300	2	0.133	0.4	240000	0.116	0.26	
301-350	1	0.067	0.467	140000	0.067	0.327	
351-400	5	0.333	0.8	800000	0.386	0.713	
401-450	1	0.067	0.867	192000	0.093	0.807	
451-500	2	0.133	1.000	400000	0.193	1.ooo	
Total	**15**	**1.000**		**2072000**	**1.000**	**0.505**	**0.505**
Gini Coefficient = 1-0.505 = 0.495							

Market concentration among retailers

The majority of retailers traded between 50 and 120 maund of rice bran in a month, with an average of 90 maund traded in a month. The total rice bran sales by retailers were Tk. 41,833.3 per month. The Gini Coefficient for retailers was 0.493 according to the results in Table 2. A Gini coefficient of 0.493 indicates a relatively highly concentrated retailer market, hence less competition. The results differ with those of Zorinah (2016) showed that the Gini coefficient was 0.672 and 0.509 for retailers indicating a highly concentrated market hence an oligopoly market structure.

Table 2. Gini coefficient for retailers in Kishoreganj District.

Quantity Sold (Maund)	Number of Traders	Proportion of Traders	Cumulative % (X)	Total Monthly Sales (TK)	Proportion Total Monthly Sales (TK)	Cumulative % (Y)	XY
40 and below	1	0.067	0.067	16000	0.031	0.031	0.0021
50-70	4	0.267	0.334	96000	0.186	0.217	0.058
71-90	4	0.267	0.601	128000	0.248	0.465	0.124
91-110	3	0.20	0.801	120000	0.232	0.697	0.139
111-130	2	0.133	0.934	96000	0.186	0.883	0.117
131-150	1	0.067	1.000	60000	0.117	1.000	0.067
Total	**15**	**1.000**		**516000**	**1.000**	**0.505**	**0.5071**
Gini Coefficient = 1-0.505 = 0.495							

Barriers to entry and exit

According to the information given by the Agricultural Extension Officer for the Kishoreganj District, there were no barriers to entry and exit into rice bran trading in terms of licensing. Anyone could acquire a trading license for a fee of TK. 1000 per year. However, only 86 percent of traders in the market had a license. The existence of unlicensed traders suggests weak monitoring and enforcement of compliance by regulatory authorities in the Kishoreganj District. The freedom to enter and exit the market was not popular among retailers. About 40 percent retailers who claimed that there were times when they lowered their selling price in order to wade off competition. Lowering of prices may act as a barrier for new entrants into the market because they would be forced to price their products even lower, hence risking a cost disadvantage. The observation tallies with that of Porter (1998) who argued that firms in an oligopolistic market structure tend to cut prices in order to win price wars. This is because such firms' long experience in the market may allow them to lower their prices unlike new entrants.

Barriers to entry may also be in the form of technical and managerial skills and availability of capital, both for start-up and working capital. Technical and managerial skills, in this context were assessed using level of education and business experience. Wholesalers had an average experience of 26.2 years in the trading of rice bran while retailers had an average of 19.5 years' experience. Most of the traders in the Kishoreganj district are educated. Traders who are better educated generally more open to innovative ideas and new technologies that promote technical change. The results show minimal chance of technical and managerial skills acting as barriers for traders to enter the market. The minimum years of experience were eight years, and the maximum was 35 years, which showed that a trader did not have to a certain number of years in the trading business in order to enter the market.

3.5 Market Conduct

The aspects used to capture the pattern of behavior followed by rice bran traders in adapting to the market situation included pricing strategies, advertising and sales promotion, terms of sale and degree of collusion. The results of evaluating these aspects of market conduct are presented below.

Pricing strategies

The most common pricing strategy observed among producers was that of competitive pricing, where they had three options: to lower their price, raise the price or set the same price as competitors. Rice miller indicated that they observe prices of other rice miller in the area and decide how to price their rice bran looking at the price of the competitors. After observing competitors' pricing 65 percent of the rice miller opted to maintain the same price as competitor while 35 percent chose to lower the price in order to attain more buyers. Among the wholesalers, it was observed that the common practice was that of maintaining the market price (90 percent). With regard to retailers the common practice was that of lowering pricing (60 percent), followed by maintaining them (40 percent). The results differ with those of Olukasi (2011) who found bargaining as the most common pricing strategy for vegetable traders in Nigeria (50 percent). Tadesse (2011) also reported bargaining of prices (42 percent) to be most common practice among traders of fruits and vegetables in Ethiopia as a compared to lowering prices (33 percent) and maintaining them (25 percent). Uncompetitive behavior was observed among retailers who tend to lower prices in order to drive out competition in the market. Lowering prices to win price wars is a characteristic of an oligopoly market structure.

Advertising and sales promotion

Some of the market participants engaged in some sort of advertising for their products. Among rice miller 49 percent of them stated that they had contracts and lists of regular buyers whom they would alert by telephone when the rice bran was ready and as soon as the rice bran is ready, they use telephone to let the buyers know. Fifty one percent of wholesalers used telephone and alert regular retailers whom they had contractual agreement. Another 28 percent advertised through regional newspapers (mainly The Northern Advertiser, a local newspaper). Retailers advertised through print media (42 percent) while the rest did not. According to Caves (1992), it is common practice for firms in an oligopolistic market to engage in non-price competition such as advertising.

Terms of sale

Terms of sale refers to the delivery and payment agreement between a buyer and a seller (Abu, 1996). The conduct of the market participants, which reflects the behavior of the firms or the decision that firms make relating to their pricing and output policy and other competitive practices, revealed that among rice miller, the two forms of terms of sale were contract selling (10 percent) and spot market selling (90 percent). Spot market selling refers to the cash and carry terms. A total of 100 percent wholesalers close to buy where rice bran was available at the best price they could afford. Retailers were the highest market actors involved in contract buying from wholesalers and some retailers. Contract sale is most common in oligopolistic market as it is a form of exclusive dealing arrangement where the two parties in contract are bound by the terms of the contract to buy or sell to each other. This may deter new entrants from penetrating into the market (Caves, 1992).

3.6 Market Performance

Rice miller's share of the retail price

Using the average rice miller price of TK. 360 for a maund of rice bran and the average retail price of TK. 450 per maund, rice miller share was 80 percent. Higher rice miller's share accrued because of rice bran does not require a lot of processing.

Rice miller gross margin

Table 3 summarizes costs, revenue and rice miller gross margin per month. Rice bran produced an average of 600 maund and the average selling price of rice bran was TK. 360. The calculated revenue acquired for rice bran per month was TK. 216,000 and the gross margin per month TK. 191,000. Monthly production of rice bran was an average of 600 maund at a cost of TK. 250,00. Therefore, the cost of producing one maund rice bran was TK. 41.7 and the gross margin generated per maund rice bran was TK. 318.3.

Table 3. Rice miller costs, revenue and gross margin.

Item	Unit	Quantity	Unit Cost (TK)	Total (TK)
A. Revenue				
Output	Maund	600	360	**216000**
B. Variable Cost				
Labour	Month	1 month	110	15000
Utility Cost	TK	1 month	320	8000
Loading/Offloading	TK	4 time	400	2000
Loss of Produce	TK	1 month	0	0
Total Variable **Costs**				**25000**
Gross Margin Per Month				**191000**

Wholesalers gross margin

Table 4 summarizes costs, revenue and gross margin for wholesalers. The average quantity of rice bran purchased from rice miller to be re-sold to retailers was 320 maund of rice bran in a month, at an average price of TK. 360 per maund. The average selling price of rice bran was TK. 400 per maund. The calculated revenue acquired for rice bran per month was TK. 128,000 and the gross margin was TK. 103,00. Wholesalers handled 320 maund rice bran per month at a cost of TK. 117,700. The average cost per rice bran was TK. 327 and the gross margin attained per maund rice bran was TK. 28.61.

Table 4. Wholesalers costs, revenue and gross margin of rice bran in Kishoreganj District.

Item	Unit	Quantity	Unit Cost (TK)	Total (TK)
Revenue				
Output	Maund	320	400	**128000**
B. Variable Cost				
Buying Cost	TK	**320**	**360**	**115200**
Utility Cost	TK			**2000**
Loading/Offloading	TK			**500**
Loss of Produce	TK			**0**
Total Variable Costs				**117700**
Gross Margin				**10300**

Retailers gross margin

Retailers' costs, revenue and gross margin are summarized in the Table 5. The average quantity of rice bran that retailers purchase in a month was 90 maund at an average of TK. 400. The average selling price of rice bran was TK. 450. The calculated revenue acquired for retailers was TK. 40,500 and the gross margin was TK. 3,100. Retailers incurred a cost of TK. 415.5 per maund rice bran and generated a gross margin of TK. 34.44 per maund rice bran.

Table 5. Retailers costs, revenue and gross margin of rice bran in Kishoreganj District.

Item	Unit	Quantity	Unit Cost (TK)	Total (TK)
A. Revenue				
Output	Maund	**90**	**450**	**40500**
B. Variable Cost				
Buying Cost	TK	90	400	36000
Utility Cost	TK			1000
Loading/Offloading	TK			400
Loss of Produce	TK			
Total Variable Costs				**37400**
Gross Margin				**3100**

Gross margin analysis is a key financial indicator used to assess the profitability of a firm's core activity, excluding fixed cost. Ignoring fixed costs, it is evident that all the market participants in the Kishoreganj District realized profits from the sale of rice bran given the positive gross margins. The gross margins were TK. 318.3 per maund rice bran for rice millers, TK. 28.61 per maund rice bran for wholesalers and TK. 34.44 per maund rice bran for retailers. Rice bran retailers in the study area attained more profits followed by rice millers then wholesalers. This indicates that rice bran retailing is the most profitable venture compared to other actors in the Kishoreganj district. The results tally with those of Mahoo (2011) and Tadesse (2011). Mahoo (2011) reported that jatropha traders generated more profit compared to farmers in Tanzania. Tadesse (2011) reported that retailers in Ethiopian fruit and vegetable market attained more profits compared to other actors in the market. However, Olukasi (2011) found contrasting results where retailers received less profit margin compared to other actors in the palm oil market in Nigeria.

Marketing margin

Marketing margin refers to the charge which a firm makes for providing marketing services. The goal is to determine whether these charges are responsible in relation to the services being offered. The average buying price of rice bran from rice millers, wholesalers and retailers was TK. 360, TK. 400 and TK. 450 per maund respectively. The wholesalers' marketing margin was 10 percent while that of retailers was 11 percent. The total gross marketing margin was 21 percent. This shows that rice bran attained a lower marketing margin relative to wholesalers. The implication of the results is that farmers paid a high price of TK. 450 for a maund of rice bran at the advantage of retailers who received a higher share of the farmer spending for a maund of rice bran.

Marketing efficiency

The marketing efficiency criterion was used to analyze the financial marketing feasibility of executing any additional marketing services. A positive sign value indicates the application of additional marketing services, and a negative value indicates otherwise. Table 6 shows the marketing efficiencies of wholesalers and retailers.

Table 6. Trader's marketing efficiency Kishoreganj District.

Traders	Marketing cost (TK)	Revenue (TK)	Marketing Efficiency (TK)
Wholesalers	370	400	105.3
Retailers	400	450	112.5

For wholesalers, the marketing cost for a maund of rice bran was TK. 370 and the revenue per maund of rice bran was TK. 400. Therefore, the marketing efficiency was 105.3. In case of retailers, the marketing cost per maund of rice bran was TK. 400 and the revenue per maund of rice bran was TK. 450. Therefore, the marketing efficiency was 112.5. Since the marketing efficiency values for the traders are positive, it justifies the results imply that rice bran trading is a viable business venture. Conceptually, efficiency of any activity or process refers to the ratio of output to input, output being the value added by the marketing system and input referring to the real cost of marketing (Kohls and Uhl, 1985). An increase in the ratio represents improved efficiency and a decrease denotes reduced efficiency. Based

on the results obtained, it can be concluded that the process of trading in the Kishoreganj District is efficient, in terms of moving rice bran from rice miller to farmers.

4. Conclusions

The rice bran market is competitively operating in Kishoreganj district. Even through the market structure is such that the number of traders and rice millers are relatively small compared to the number of farmers and consumers, therefore entry requirements at different levels. To the existing of rice bran market channels involved a number of channels and not just one single channel. The rice bran market channels are limited to rice millers, wholesalers and retailers and ultimately to farmers. From the findings of this study the marketing system of rice brand in Kishoreganj district can be regarded as noncompetitive due to the existence of an oligopolistic market structure. Rice millers were found to earn higher gross margins compared to rice bran traders however retailers received a large share of the final farmer price compared to wholesaler even though wholesaler incurred more marketing costs. Generally, the rice bran market in Kishoreganj district is not to a satisfactory state due to lack of collusive behavior among market participants and availability of market information. Farmers in the study area seem to be paying a high price for rice bran in relation to rice millers' prices. There is therefore the need for an integrated agricultural marketing information system which is linked to rice millers, wholesalers, retailers and final farmers in order to avoid exploitation of high prices.

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