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Rice Husking as an Agro-Processing Business in Some Selected Areas of Bangladesh*

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Abstract

The present study has been conducted to estimate the cost and margin of the rice husking mills, to identify the socio-economic characteristics of workers engaged in rice processing and explore the problems faced by the millers. The study is based on sample survey of 30 rice millers from Mymensingh and Gazipur districts. Both primary and secondary data were used in this study. Primary data were collected in March, 2006. None of the women workers had the age below 20 years, 40% women workers had primary education, average family size was 4.70, average earning member was 2.0 and the dependency ratio was 2.35. The total marketing costs were Tk.110.69 and Tk. 148.72 per 100 kg paddy for normal/semi-automatic and automatic rice miller respectively. The net marketing margins were Tk. 92.16 and Tk. 96.29 per 100 kg paddy equivalent rice for semi-automatic and automatic respectively. The annual average income of women worker of rice mill were 43800.00 from the rice mill. Among various problems irregularity in power supply, short supply of paddy, shortage of working capital, transportation problem, lack of skilled labour for automatic rice mill, spare parts of semi-automatic and automatic rice mill, and credit problems were most severe problems of rice processing mills. Uninterrupted power supply, provision of bank loan, improvement of transportation system, improvement of law and order situation, available of spare parts were suggested to improve the overall situation.

Keywords: *Rice husking, agro-processing, marketing cost, marketing margin and profitability*

Introduction

The total production of milled rice was about 18 million tons in Bangladesh (BBS, 2007). Rice is processed by the commercial rice mills (small, major or semi auto and automatic rice mills). More than 80% of rice is processed in the village and about 20% is processed in the commercial rice mills (Khan, 2005). Rice milling is the largest single food industry in Bangladesh. Although huge amount of capital is invested in rice milling industry of Bangladesh, the efficiency of the industry is far lower than that of other countries including our neighboring country, India (Das, 2006).

Agribusiness is the sum of all operations involved in the manufacture and distribution

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of farm supplies, production activities on the farm, and the storage, processing and distribution of farm commodities and items made from them. Agribusiness includes all the vital activities performed both on and off the farm that contribute to the food and fiber system's overall success. This system is made up of (i) the agricultural input sector (ii) the production sector and (iii) processing and manufacturing sector. In order to analyze the critical features of the structure and behavior of agribusiness commodity system, the present study deals with agribusiness of rice husking.

Islami Bank Bangladesh Limited plays a vital role for investing a huge amount in different sectors. In agriculture sector IBBL invested Tk. 6485 million i.e. 4.47% of the total invested capital (IBBL, 2007). People of Bangladesh mainly live on rice and hence rice and food are often synonymously used. The Government of Bangladesh has taken a number of programs to give incentive to increase farmers' investment in rice production. The main objective of this study is to increase farm level productivity by reducing cost and to improve the marketing system of paddy/rice in different times. Incentive to the farmer is considered as the main tool for increasing production of paddy in the country.

Although the lands are decreasing day by day but the volume of production is increasing gradually due to introduction of HYV rice, increasing cropping intensity, better cultural practices and modern post harvest technology. Hence increased production needs processing of greater volume of crops. Rice is a very important cereal crop of Bangladesh. So, for husking this paddy a large number of paddy processing mills have been established in Bangladesh. A large number of workers are directly or indirectly employed in rice processing mills. But there was no exclusive study concerning the investment of commercial Bank. The present study therefore, has been undertaken to examine the impact of investment on rice husking mills in some areas of Bangladesh.

It is expected that further study on the aspects would add new dimension to the government policy planners, independent researchers and academicians for setting, formulating and taking pragmatic decision in order to further up lifting the performance of the rice millers and socio-economic status of the rural poor which would help the country to reduce poverty, having been one of the important objectives of millennium development goals of the government.

The specific objectives of the present study are as follows:

(i) To examine the socioeconomic status of the women workers engaged in rice husking mill.
(ii) To determine the cost and margin of rice husking mill.
(iii) To identify the problems and suggestions related to rice husking mill.

Methodology

The data for the study were collected both from primary and secondary sources. The collected from primary sources have been done through a carefully designed interview schedule. Direct interviews of the targeted beneficiaries were made by the researcher himself through administering carefully assigned and pre-tested interview schedules. Attempt was also made to collect data through informal discussion with the rice

millers. The data collected from secondary sources include the publication of the Bangladesh Bureau of Statistics (BBS), Papers and leaflets of IBBL, Census Reports, Research Report of the Bangladesh Institute of Development Studies (BIDS) and different national and international journals.

For the present study, information was collected from Rice millers and female workers of the rice millers of Mymensingh and Gazipur District. On the basis of information of IBBL, four upazilas namely Muktagacha, Trishal, Mymensingh Sadar and Phulpur of Mymensingh District and one Upazila of Gazipur District namely Sreepur were purposively selected for the study.

Table 1. Information of sample and sampling procedure

District	Upazila	No. of miller	No. of women workers
Mymensingh	Muktagacha	4	4
	Trishal	2	2
	Sadar	8	8
	Phulpur	4	4
Gazipur	Sreepur	12	12
Total		30	30

For achieving the ultimate objectives of the study, a total of 30 rice millers and 30 female workers were surveyed. Out of them, 18 rice processing mills were from Mymensingh District of which 2 from Trishal, 8 from Mymensingh sadar, 4 from Muktagacha and 4 from Phulpur Upazila. In Gazipur District, 12 rice millers from Sreepur Upazila under Gazipur District were selected. The researcher visited the respective rice processing mills and necessary data were collected by personal interview method. The rice millers, on whom the Islami Bank Bangladesh Limited made investment, were considered as sampling unit. Table 1 provides information about sampling procedure.

Findings and Discussion

Socio-economic profile of the women workers

People differ from one another in many respects. Behavior of an individual is largely determined by his/her socio-economic characteristics. Socio-economic characteristics of the women worker influence their family. Therefore, an attempt has been made here to investigate into some important socio-economic characteristics of the sampled women workers. It is evident from the Table 2 that out of the total women worker, 50% fell into 30 to less than 40 years. This information implies that the majority of women worker fell in the age group of 30 to less than 40 years indicating that they were relatively younger in age and was in the position to put more physical effort for rice processing. The average age of the women worker was 31.5 years. The level of literacy is also shown in Table 2. Table 2 shows that out of 30 women worker, 40% of the women worker had primary level of education and it was the highest of them. The

selected women workers were classified into the following groups :(a) Below 18 years, (b) 18 to 57 years and (c) above 57 years. It is evident from Table 2 that the average size of family consisted of 4.70 members of whom 2.57 were male and 2.13 were female. It appears from the table and was characterized by majority of male members. Table 2 also reveals that on an average 47.52% family members were in the age group of 19 to 57 years. Thus majority of the family members were found in the working group. The literacy levels of the family members according to their sex are shown in Table 2. It appears that 53.90% of family members had primary education, only 28.37% male and 25.53% female members have primary education.

Table 2. Socio-economic profile of the women worker

Item		No. of women workers	% of total
Age of women workers ranges 30 to 40 years		15	50.00
Literacy lever of the women workers (primary level and above)		12	40.00
Average family size (no.)	Male	2.13	45.32
	Female	2.57	54.68
Age group between 19-57 years of family members	Male	0.97	43.28
	Female	1.27	56.72
Literacy level of the family members women workers (primary level and above)	Male	1.20	47.37
	Female	1.33	52.63
Dependency ratio		2.35	-
Average annual income (Tk.)		95840.20	
Income from rice milling (Tk.)		43800.00	45.70

It is evident that the average earning member was 2.0, constituting 42.55% of total family members. Average dependent member was found 2.7, which was 57.45% of total family members. The dependency ratio, on an average was found 2.35. Income is the most important indicator of socioeconomic status of people. Overall income of a household consists of income from rice mill and other income. Income earned from agriculture, rickshaw pulling, Van pulling, day labourer, fishing petty business etc. were considered as other income in the present study which have been estimated by summing up the income derived in monetary value from the above mentioned sectors. Values of agricultural commodities, consumed at home were also included in income. The average annual income was estimated at Tk.95840 which indicates that income from rice mill 45.70% while the income from other sources shared 54.30% of total income. It means that major income of the households, were incurred from different sources other than rice mill. Income from rice mill occupied about half of the average annual income. So rice mill contributed a large portion of the annual income.

Cost and margin of rice processing in mills

Cost is the value of inputs needed to produce any good or service. This has to be measured in some units or numeraire, usually money. Margin is a proportion of the value of a transaction which traders have to deposit to guarantee that they will complete it.

Paddy processors have to perform various functions towards processing paddy. Processors purchase paddy and sell rice.

Between these two stages there are many functions that become essential to perform the business of milling such as transportation, parboiling, drying, cleaning, milling, packaging etc. Paddy processors have to spend some money for performing each of these functions. There are some extra costs also; these are commission of Aratdar, salary of permanent labour, tax of land, market toll, electricity bill etc.

The millers bought paddy from farmers, Beparis and Aratdars. They bought a significant portion of their purchase from Aratdar who charge a fixed commission usually Tk. 14 to 18 per 100kg. It was reported by the respondents that the purchase price per 100 kg of paddy ranges from Tk. 1100 to Tk. 1560 (Table 3).

Table 3. Cost of paddy collection Tk. per 100 kg

Items	Types of mills		
	Normal /semi-auto	Automatic	All average
Transportation cost	29.16	47.25	38.21 (71.14)
Commission of Aratdar	15.00	16.00	15.50 (28.86)
Total	44.16	63.25	53.71 (100)

Note: Figures within parentheses indicate percentages.

Table 3 shows that the largest single component was transportation cost and it was 71.14% of total collection cost. The second largest cost was commission of Aratdar (28.86%). Transportation cost includes loading and unloading, labour cost, weighing, and market toll etc. It shows that the total cost was higher for automatic rice mills (Tk. 63.25 per 100 kg) followed by normal/semi-automatic rice mill (Tk. 44.16 per 100 kg). Because the automatic rice millers process large amount of paddy and they collect 50% of paddy from other districts. For this reason, their transportation costs were higher. As they bought more quantity of paddy from Aratdars, they have to pay more commission to Aratdars compared to semi-automatic rice millers. That is why total cost was the highest for automatic rice millers.

Cost of processing was classified in two categories: (i) Fixed cost and (ii) Variable cost. The fixed costs include salaries of permanent labour, depreciation cost, rent of land and license fees. Depreciation cost was calculated on the basis of length of life of a machine. Depreciation cost per year was calculated, and then it was divided by total amount of paddy processed per year. The depreciation cost per 100 kg of paddy was calculated in the following way

$$\text{Depreciation cost per year} = \frac{Begining\,value - salvage\ value}{Life\ of\ machine\ (year)}$$

$$\text{Depreciation per 100 kg of paddy} = \frac{Depreciation\ \text{cost}\ per\ year}{Total\ Amount\ of\ Paddy\ processed\ per\ year} \times 100$$

Other fixed costs per 100 kg were also calculated by following the same procedure. Variable costs include costs of labour required for parboiling, drying, cleaning,

milling and packaging etc. Electricity bill and wastage of gunny bags were also considered as variable cost because these costs incurred only when the mill runs.

Major fixed costs of millers are shown in Table 4. About 66.73% of total fixed cost was incurred as salaries of permanent labour. Depreciation cost accounted for 31.91% of total cost. Rent of land and licensed fees constituted 1.08% and 0.34% respectively. The highest fixed cost was incurred by automatic rice mills because of the fact that they had more permanent labourers and they paid higher salaries to their permanent labourer compared with others mills. Since automatic rice mills have big establishment, their depreciation cost was higher. The study reveals that fixed cost was increased with the increase of mill size.

Table 4. Fixed cost for processing Tk. per 100 kg paddy

Items	Types of rice mills		All average
	Normal /semi-automatic	Automatic	
Salary	8.47	11.26	9.87 (66.73)
Depreciation	2.14	7.29	4.72 (31.91)
Rent of land	0.11	0.21	0.16 (1.08)
License fees	0.04	0.06	0.05 (0.34)
Total	10.76	18.82	14.79 (100)

Note: Figures within parentheses indicate percentages of total fixed cost.

In case of semi-automatic rice mill, milling cost includes parboiling, drying, milling and packaging. Among all variable costs incurred by a mill, the milling cost was the highest cost item representing 48.35% of total variable cost. Electricity bill 24.40% occupied the second position (Table 5). Automatic rice mills did not incur parboiling cost and drying cost because these works finished mechanically. Automatic rice mills incurred the highest variable cost and it was Tk. 81 per 100 kg. The reason is that milling cost and electricity bills were much higher for automatic rice mill. For using improved technology and mechanical dryer milling and electricity costs were found significantly higher in the case of automatic rice mills. Others include interest on working capital, entertainment to buyers etc.

Table 5. Variable cost for processing per 100 kg paddy

Items	Types of rice mills		All average
	Normal /semi-automatic	Automatic	
Milling cost	30.57	37.40	33.99 (48.35)
Electricity Bill	12.07	22.23	17.15 (24.40)
Cost for gunny bags	12.50	12.50	12.50 (17.78)
Maintenance cost	2.26	5.57	3.92 (5.58)
Others	2.14	3.36	2.75 (3.91)
Total	59.54	81.06	70.30 (100)

Note: Figures within parentheses indicate percentages

Table 6 shown that in the case of paddy processing total cost of processing of paddy was estimated Tk 85.09 per 100 kg, of which about 82.62% was variable cost and rest was fixed cost. The automatic rice mill incurred the highest total processing cost compared to

normal/semi-automatic rice mill. The findings indicate that processing costs for small and major rice mills were lower than that of automatic mill. The reason is that, the automatic rice mills incurred significantly higher variable and fixed costs compared semi-automatic rice mills.

Table 6. Fixed and variable cost for processing paddy per 100 kg

Items	Types of rice mills		All average
	Normal /semi-automatic	Automatic	
Fixed cost	10.76	18.82	14.79 (17.38)
Variable cost	59.54	81.06	70.30 (82.62)
Total cost	70.30	99.88	85.09 (100)

Note: Figures within parentheses indicate percentages

Distribution channels of normal/semi-automatic rice millers and automatic rice millers were of little different. Automatic rice miller sold their large portion of milled rice in terminal market; a small portion is sold in the local market. So there is little difference in cost structure between the millers (Table 7*)*. Transportation cost was the highest in all cases (54.78%). The second highest cost was commission paid to Aratdars (33.44%).

Table 7. Selling cost per 100 of paddy equivalent rice by millers

Items	Types of rice mills		All average
	Semi-automatic	Automatic	
Transportation cost	20.56	28.34	24.45 (54.78)
Commission of Aratdar	14.58	15.25	14.92 (33.44)
Loading	5.25	5.25	5.25 (11.78)
Total	40.39	48.84	44.62 (100)

Note: Figures within parentheses indicates percentages

Marketing margin at a particular stage of product may be defined as the difference between sale price and purchase price of a commodity. According to Kohls and Uhl (1980), marketing margin may be defined as the difference between what is paid by the consumers and what is received by the producer. On the other hand, marketing margin refers to the difference in value for equivalent physical quantities of a given commodity between different stages of marketing. Marketing margin of different types of millers was estimated by deducting the sale price of 100 kg of paddy equivalent rice from purchase price of 100 kg paddy while the net profit was estimated by deducting marketing cost per 100 kg of paddy equivalent rice from the share of marketing margin (Table 8).

Table 8 shows that inspite of the higher total cost, automatic rice millers earn the highest profit of Tk. 96 .29 per 100 kg because they processed better quality of rice and by-product which are sold at higher prices compared with semi-automatic millers. Semi-automatic rice millers earned the profit of Tk. 92.16 per 100 kg of paddy equivalent rice.

Table 8. Marketing margins of different types of millers

(Tk/l00kg of paddy equivalent)

Particulars	Types of rice mills	
	Semi-automatic	Automatic
Sale price of rice	2003.53	2047.13
Purchase price of paddy	1800.68	1802.12
Gross marketing Margin	202.85	245.01
Total cost (processing +selling)	110.69	148.72
Net marketing margin	92.16	96.29

Note: Gross marketing margin = sale price — purchase price
Net margin = Gross marketing margin — total cost
Total cost = Cost of paddy collection + fixed cost + variable cost + selling cost.

Problems of rice husking in mills

The reasons that hamper the achievement of goals are defined as problems. The owners of rice mill faced various problems in processing paddy. These problems are presented in Table 9. The transportation problems are different for different modes of transports as well as for different market locations. Almost all automated rice millers have vehicle for transportation of paddy and rice. But in case of normal or semi-automatic rice millers, 50% have vehicle. Transportation problem becomes serious in the peak period of *Aman* and *Boro* seasons. In the study area, 22% of millers reported this problem. Working capital is an important factor for the rice millers. Most of the millers reported that they suffered from shortage of necessary capital during the period of full operation. Due to shortage of working capital the millers could not purchase paddy in a large volume to meet up their demand in lean period. In the study area 35% of millers claimed this problem. The owners of rice mill felt to have more credit from the banks. They did not get adequate credit from the banks according to their requirement. Further they reported that increase in bank interest has also discouraged them to borrow more loans from banks. In the study, 30% millers reported this problem. Normal/semi-automatic rice millers mostly faced the problem of credit.

Power failure is a major problem of rice processors. The millers reported that irregular supply of electricity arises as a problem to run their mills smoothly; they mentioned that they had to stop all activities when there was no electricity. They also reported that the higher processing cost due to irregular supply of electricity affected their business. In the study, 90% of millers suffered from this type of problem. The supply of paddy was found to be seasonal. Paddy is available in the peak period of *Boro* season and *Aman* season. But except this period the millers could not run their mills or could not utilize full capacity of mill due to shortage of paddy. In the study, 56% millers faced this problem. Automatic rice miller faced this problem severely. Except automatic rice mills the milling process involves open sun drying that was hampered due to rough weather, especially in rainy season. The millers reported that on an average, it takes two and a half day per *chatal* for drying parboiled paddy, where the time length is 4 to 5 days or even more in the rainy season. In this study, 40% semi-automatic rice millers reported this problem. Though the labourers are available in Bangladesh but most of them are unskilled and in the peak period the required labour was not found in the study area. In the rice processing mills most of the labourers were totally illiterate. They did not process paddy

in scientific way, which reduce milling outrun. In the study 25% millers claimed this problem. The spare parts were very scarce both semi-automatic and automatic rice mills. Sometimes the millers have to purchase spare parts from outside the country, which is very costly and troublesome for them.

Since there is no barrier to new entry in the rice milling industry and trade license is easily available, many new millers have entered paddy-processing mills. This has reduced the market share of individual millers. So, their income has been reduced. In the study area 20% of millers faced this problem. Lack of adequate market information was a problem for the millers. The millers could not collect market information rapidly due to shortage of support service from the government. The millers also reported that they sometimes faced some undesirable incidence like robbery, theft etc. They did not have any support against these causes. In this study 15% of millers complained about this problem. Strike and political unrest is one of the major problems of rice processing mills. Frequent strikes and *hartals* in recent year have seriously affected rice trading, particularly by disrupting transport services. Claim of illegal subscription has also been increased in the recent years. The millers also faced disturbance from transport brokers (Dalals). The brokers operate their business opening chambers in the market locations. They have to pay some charges to brokers, which increase transportation cost. In this study 16% of millers reported this problem. The private traders import rice without assessing market demand. Sometimes this excess supply of rice caused lower market price and the rice millers incurred loss. Only 8% millers mentioned this problem.

Table 9. Problems encountered by the millers in operating their business

Problems	Normal / Semi- auto rice mill		Automatic rice mill		Average	
	%	Rank	%	Rank	%	Rank
Transportation	26	7	18	8	22	7
Storage of working capital	40	3.5	30	4	35	4
Credit	40	3.5	20	7	30	5
Irregularity in power supply	80	1	100	1	90	1
Short supply of paddy	39	5	73	2	56	2
Rough weather	65	2	15	10	40	3
Scarcity of spare parts	16	9	24	5	20	8.5
Skilled labour	17	8	32	3	25	6
Inadequate market information	14	10	16	9	15	11
Low volume of sale	27	6	13	11	20	8.5
Political unrest	10	11	22	6	16	10
Import of rice	5	12	11	12	8	12

Suggestions for improving rice husking in mills

After identifying problems, the mill owners also suggested some measures to operate their firms smoothly and efficiently. These are discussed and presented in Table 10. Some millers (15%) suggested for improvement of transport facilities. Improvement of roads would increase the efficiency of the transportation system and

transportation cost would be lower. They suggested that government should take necessary steps to eliminate transport labour unions' unrest. Some millers also suggested (27%) that the millers' association should be stronger to reduce the activities of transport broker. Some millers (45%) suggested for provision of bank loan to meet up their operating cash capital. In this respect, they suggested reducing bank interest rates and establishing new bank branches in rural areas. The majority of millers (95%) suggested that government should take special measures to supply electricity in the rice processing mills at least 20 hours per day and reduce electricity charge for these firms as in agricultural farmers.

The millers suggested (55%) that government procurement programmes of paddy should be strengthened. Adequate supply of paddy by the government would increase the capacity utilization of mills. In this connection they suggested that procurement of paddy directly from farmers (rather than through middlemen) and collection of rice from mill gate should also be increased. A few (19%) rice millers suggested the government in rainy season should supply mechanical dryer. Supervisors and labourers of the rice processing mills should be well trained on their specific job and should be aware of market requirement as well as regulatory measures. Dissemination of market information by government may enable the millers to get fair price for their produce. Twenty percent of millers suggested dissemination of market information by the government as a measure for solution of the marketing problem. In order to ensure the sociopolitical stability in the country, the government should take necessary steps against frequent strikes, hartals and illegal subscription. The millers' suggested to restrict private traders' import of rice without assessing market demand. Sometimes the excess supply of imported rice resulted in lower price of rice in the market. In the study 15% of millers suggested this measure to solve the problem. The millers' suggestions also include government interference in different fields. For example, to overcome natural calamities mechanical dryer should be available at reasonable price. Their suggestions also include elimination of harassment by local food and police officials and improving law and order situation for checking theft, robbery and disturbance created mostly by local hoodlums.

Table 10. Suggestions by the millers for improvement of rice processing mills

Suggestions	Semi-automatic rice mill		Automatic rice mill		Average	
	%	Rank	%	Rank	%	Rank
Regularity in power supply	90	1	100	1	95	1
Improvement of transformation system	17	8	13	9	15	8.5
Provision of bank loan	48	2	42	5	45	4
Introduction of mechanical dryer	22	7	16	8	19	7
Adequate market information	42	3	66	3	54	3
Training of labour	23	6	51	4	37	5
Avail ability of paddy supply	41	4	69	2	55	2
Control of political problems	26	5	32	6	29	6
Regulation of import of rice	11	9	19	7	15	8.5

Conclusion

Rice husking as an agro-processing business has potential of profit both in domestic and international market and the rice mills have provided job opportunities for a significant portion of our skilled and unskilled people. For a poor country like Bangladesh, where unemployment is a severe problem, the government along with all concerned should try their best to expedite the improvement of this industry in order to generate a good employment opportunity. Government should take proper rules and regulations so that any women worker did not encounter gender based discrimination. Measures should be taken to provide institutional credit in easy terms and conditions for establishing automatic rice mill. Uninterrupted power supply is also a vital factor for increasing milling capacity. So power supply should be regular.

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