

Market Effects on the Production and Profitability of Sugarcane, Sugar and Gur in Bangladesh

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ABSTRACT

The study was conducted during 1999-2000 cropping season in two mills zone namely Thakurgaon and Rajshahi sugar mills and three non-mills zone districts of Sirajganj, Nawabganj and Gazipur to identify the marketing system, organization and marketing constraints, cost, margin and efficiency to formulate an effective marketing policy for sugarcane. In mills zone, the farmers marketed a large portion of sugarcane in the sugar mills (52.37 %) for fixed price followed by cane diversion for gur making (31.79 %) and the rest amount was used for seeds (15.84%). In non-mills zone, the farmers use larger portion of their sugarcane for self gur production (50.90%) followed by sale to gur maker (37.59%) and the rest amount of cane (11.51%) used for seed cane and seed sale to others. The study showed that marketing cost of sugar per ton was higher for dealer (Tk. 647.95) followed by retailer (Tk. 472.75) and wholesaler (Tk. 333.51) respectively. Gur marketing cost per ton was found higher for wholesaler (Tk. 687.66) followed by 'Paiker' (Tk. 481.82), retailer (Tk. 385.96) and 'Aratder' (Tk.252.25) respectively. The study also showed that per ton sugar marketing margin was found higher for retailer (Tk. 2819.25) followed by wholesaler (Tk. 765.49) and dealer (Tk. 618.05) respectively. Gur marketing margin per ton was found higher for retailer (Tk. 1529.04) followed by 'Aratder' (Tk. 1074.75), 'Paiker' (Tk. 1003.18) and wholesaler (Tk.620.34) respectively. In case for sugar marketing, the efficiency of wholesaler was higher (98.88%) followed by retailer (98.58%) and dealer (97.75%). On the other hand, for gur marketing the efficiency of 'Aratder' was higher (98.63%) followed by retailer (98.22%), 'Paiker' (97.17%) and wholesaler (96.52%).

Key words : Sugarcane, sugar, gur, marketing constraints, cost, profitability.

INTRODUCTION

Sugarcane is a perishable crop that needs to be marketed quickly after harvest. Sugarcane is generally utilized by sugar mills, rural based cane crusher and for chewing. Currently Bangladesh is producing 6.8 mMT of sugarcane. Of the 6.8 mMT, 2.3 mMT are used by sugar mills to produce 0.20 to 0.21 mMT of sugar and 3.10 mMT are used to produce 0.30 mMT of gur and remaining 1.40 mMT are used for seed and chewing. Based on per capita consumption i.e. 3 kg sugar and 3.66 kg gur (Total 5.8 kg sugar equivalent), the country's annual sugar and gur requirement stand at 0.36 and 0.44 mMT (assuming 120 million population) respectively. The country produces 0.20 to 0.21 mMT of white sugar in 16 sugar mills and 0.30 mMT gur annually. Shortfall of sugar (0.15 to 0.16 mMT) is met from importation. Shortfall in gur (0.14 mMT) cannot be met from importation,

because gur is not available in the international market (Kranti, 1996). The price of sugarcane in the millzone and the price of sugar is fixed by the government more or less arbitrary. On the other hand, the price of sugarcane in the non-millzone and gur price is fixed by the open market operation. The marketing systems of sugarcane (cane procurement activities) in the sugar mills are subdued by manifold problems which hamper the interest of cane farmer as well as the sugar mills. No systematic study has yet been undertaken to identify the problems of sugarcane, sugar and gur marketing system in Bangladesh. The present study is a modest attempt for identifying the problems of sugarcane, sugar and gur marketing and indicate policy guidelines that would increase production of sugarcane as well as sugar.

Ali (1996) found various marketing problems faced by the farmers while selling their cane to the mills. These problems are issue of insufficient cane supply permit (purjee), delay in lifting of cane from the zone areas, delay in payment of dues, purchasing of purjee from the middlemen at high price and reduction of the weight of cane due to delay in lifting. As a result the farmers are selling their cane to the gur makers at a higher price which hampers the adequate supply of cane to the sugar mills. Again, higher marketing and production cost of sugar, sale of sugar in the late period, low price of the by-product and large scale smuggling of sugar from India have been identified as problems of efficient sugar marketing in Bangladesh. On the other hand, the gur market is scattered and disorganized. Moreover, by nature sugarcane quality inclines after harvesting and it cannot be stored for longer period. Until recently very little effort was made to study the sugarcane, sugar and gur marketing in Bangladesh. Das (1992), found that average per ha production of sugarcane and gur under the Zeal Bangla sugar mills area were 71.5 tons and 6.65 tons respectively. Average marketing cost and market price of gur were Tk. 1382.08 and Tk. 34438.00 per ton respectively. Average per ha production cost of gur was Tk. 71,877.00 of which 74.49 percent was for sugarcane production and the rest was for gur manufacturing. Farmers average profit was Tk. 21,135.00 per ha of gur production. Bangladesh Sugar & Food Industries Corporation (1994) published a report on the performances of the sugar industries in Bangladesh. High production cost of sugars and low recovery rate of sugar, constraints of cane procurement by the mills and marketing of sugar and by-products were identified as causes of losses in this report. Ali (1996) in the average production cost of sugarcane estimated at Tk. 5.51 per ton and net return from sugarcane at Tk. 3.32 per ton, when the sugarcane was sold to the mills. The marketing cost of sugarcane for all farmers was estimated at Tk. 1.40 per ton, when the cane sold to the mills and it is about one fourth of average production cost. On an average, the cost of sugar production during the study period was estimated at Tk. 29,768.08 per MT. The average net loss per MT of sugar was estimated at Tk. 3298.68 with the highest at Tk. 6884.07 in 1995-96 and the lowest of Tk. 303.95 in 1993-94. High production cost of sugar, sale of sugar in the late period, smuggling of sugar from neighboring countries, low price of by-product, inadequate cane supply to the mills, illegal claims of the labourer and staff and political crisis were identified the main causes of losses of the mills. The major objective of the study was to identify the marketing system, organization and marketing constraints, cost, margin and efficiency to formulate an effective marketing policy of sugarcane, sugar and gur in Bangladesh.

MATERIALS AND METHODS

The study was conducted during 1999-2000 cropping season in two mills zone namely Thakurgaon and Rajshahi sugar mills and three non-mills zone districts of Sirajganj, Nawabganj and Gazipur. Data have been collected from 60 sugarcane farms of two selected mills zones and 87 sugarcane farms of three selected non-mills zones. In total of 147 sample farmers were interviewed from 47 villages of both mills and non-mills zone districts and collected sugarcane, sugar and gur marketing information of their produced sugarcane. Random sampling technique was employed to collect data from the sugarcane farms, gur makers and from different functionaries of their marketing channel. Thirty samples were also selected from each marketing intermediaries like retailer, 'Paiker' 'Aratdar' and wholesaler about gur and sugar marketing from metropolitan cities like Dhaka and Rajshahi. Data have been collected by the investigators with prescribed questionnaire. Descriptive and statistical methods were employed to analyse the data. Marketing cost, marketing margin were calculated by some mathematical formula and efficiency was calculated by Shepard Model. The study has identified the existing sugarcane marketing constraints and its problems faced by the farmers as well as sugar mills in Bangladesh. It has also identified their marketing organization, marketing channel, marketing margin, marketing cost and marketing efficiencies. Finally, it suggested policy guidelines for efficient and sound marketing system for sugarcane, sugar and gur in Bangladesh.

ANALYTICAL TECHNIQUE

Determination of Marketing Efficiency

The following approach introduced by Shepherd has been used to measure marketing efficiency:

$$\text{Marketing Efficiency} = 1 - \frac{\text{Total marketing cost per ton}}{\text{sugar/gur}} \times 100$$

Marketing cost included cost of transportation, rent, storage, tax and labour costs. Interest on capital was computed at the rate of 15% per annum.

RESULTS AND DISCUSSION

Farm Size and Production of Sugarcane

The sample average farm size was 2.64 ha in the mills zone and 2.24 ha in non-mills zone. Total average sugarcane land area of mills and non-mills zone were found 0.77 ha and 0.61 ha per farm respectively. It was observed from the study that per ha sugarcane production was higher (42.31 tons) in mills zone than non-mills zone (41.65 tons) districts (Table 1).

Table 1. Farm size and production of sugarcane in the mills zone (TSM, RJSM) and non-mill zones (Sirajganj, Nawabganj and Gazipur), 1999-2000.

Location	No. of Villages	No. of Farmers	Average Farm Size (ha)	Average Sugarcane Land area (ha)	Total Sugarcane Production (tons)	Per ha cane Production (tons)
Mill zone :						
Thakurgaon	11	30	3.77	0.86	1083.674	41.98
Rajshahi	7	30	1.51	0.67	862.437	42.63
Total	18	60	2.64	0.77	1946.111	42.31
Non Mill zone :						
Sirajganj	15	29	1.66	0.41	700.853	58.94
Nawabganj	8	29	1.54	0.63	504.236	26.67
Gazipur	6	29	2.33	0.80	917.390	39.35
Total	29	87	1.84	0.61	2122.479	41.65
All Farm	47	147	2.24	0.69	4068.590	41.98

Source: Field Survey, 1999-2000

Production and Disposal Pattern of Sugarcane in the Mills and Non-mills zone

The study showed that the farmers of the mills zone usually dispose their cane in the form of cane supply to the mills (52.37%), seed use by own (10.49%), seed supply to other farmers (5.35%), sale to gur makers (27.13%) and use for self gur production (4.66%). There is restriction to sell sugarcane to the gur makers and also to produce gur in the mills zone. The gur makers pay higher price of cane and thereby the farmers divert a significant amount of sugarcane (31.79%) in the mills zone which resulted shortages in sugar production (Table 2). On the other hand, Table 2 shows that the farmers of the non-mills zone areas usually dispose their cane in the form of seed used by own (8.65 %), seed supply to the other farmers (2.86%), sale to gur makers (37.59%) and use for self gur production (50.90%). In mills zone, the farmers marketed a large portion of sugarcane in the sugar mills (52.37 %) for fixed price followed by cane diversion for gur making (31.79 %) and the rest amount was used for seeds (15.84%). In non-mills zone, the farmers use larger portion of their sugarcane for self gur production (50.90) followed by sale to gur makers (37.59) and the rest amount of cane (11.51) used for seed cane (Table 2).

Table 2. Production and disposal pattern of sugarcane in the mills zone (TSM, RJSM) and non-mills zone (Sirajganj, Nawabganj and Gazipur) farms, 1999-2000.

Location	Total Cane Production (tons)	Cane supply to Mills (tons)	Seed (tons)	Seed supply (tons)	Sale to gur maker (tons)	Self Gur Production (tons)	Total cane Diversion (tons)
Mills zone :							
TSM	1083.67 (100)	580.59 (53.57)	128.47 (11.86)	90.11 (8.32)	194.08 (17.91)	90.42 (8.34)	284.50 (26.25)
RJSM	862.45 (100)	438.55 (50.84)	75.79 (8.79)	14.11 (1.64)	334.00 (38.73)	-	334.00 (38.73)
Total	1946.12 (100)	1019.14 (52.37)	204.26 (10.49)	104.22 (5.35)	528.08 (27.13)	90.42 (4.66)	618.50 (31.79)
Non-mills zone:							
Sirajganj	700.86 (100)	-	61.19 (8.73)	-	5.10 (0.73)	634.57 (90.54)	-
Nawabganj	504.25 (100)	-	55.73 (11.05)	41.44 (8.22)	26.75 (5.31)	380.33 (75.42)	-
Gazipur	917.39 (100)	-	66.60 (7.26)	19.20 (2.09)	765.99 (83.50)	65.60 (7.15)	-
Total	2122.50 (100)	-	183.52 (8.65)	60.64 (2.86)	797.84 (37.59)	1080.50 (50.90)	-

Figures in parentheses are the percentages of total sugarcane production.

Marketing Systems and Organization of Sugarcane, Sugar and Gur in the mills zone and Non-mill zone

Marketing Channels of Sugarcane in the mills zone and Sugar distribution in Bangladesh

The study showed that the following sugarcane and sugar marketing channel generally operate in the mills zone of Bangladesh (Figure 1). Sugarcane produced by the farmers of mills zone has disposed by supplied to the sugar mills either directly or through cane purchasing centre, self gur production, seed sale to other farmers, seed use for own plantation and a significant amount of sugarcane is sold to the gur makers. On the other hand, sugar produced in the sugar mills is distributed to final consumer via dealer, wholesaler and retailer. The Government also distributes a significant portion of sugar directly for police/army, through rationing and for industrial quota. In the non-mills zone, the study implies the following marketing channel of produced sugarcane and gur (Figure 2). Sugarcane produced by the farmers in the non-mills zone are sold to the gur makers, seed to the other farmers, seed use for own plantation and self gur production for their farming business. The produced gur is marketed to the final consumer via 'Paiker', 'Aratder', wholesaler, retailer and directly to the 'Aratder', retailer and consumer.

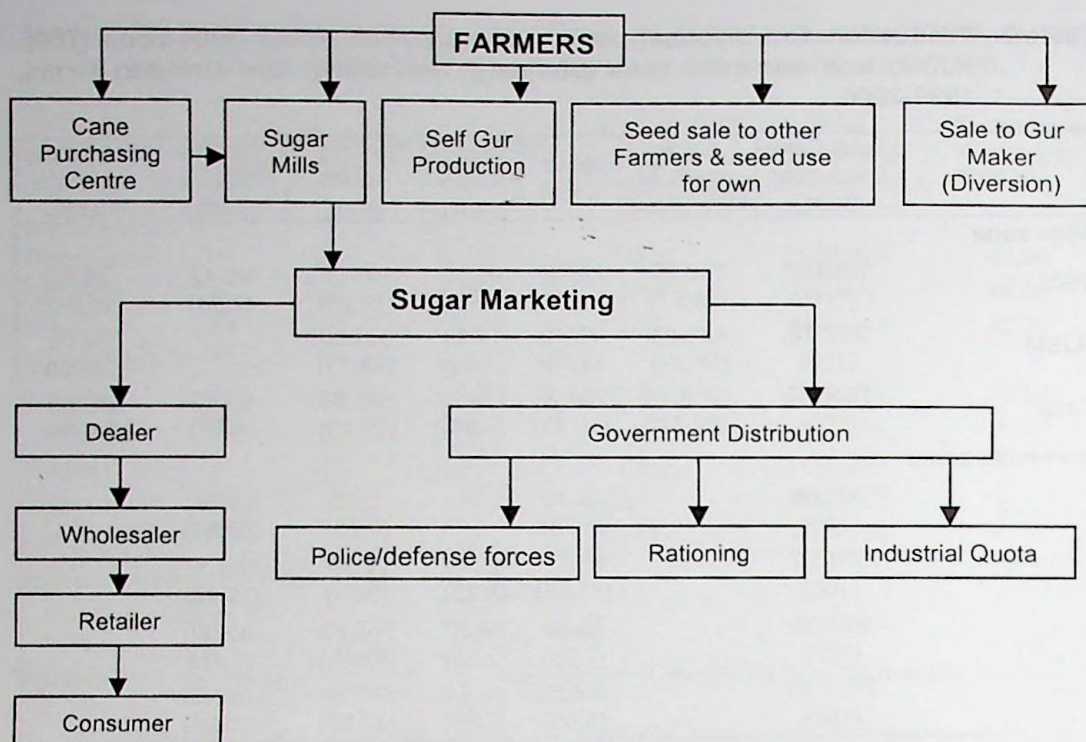


Figure 1. Marketing channel of sugarcane in the mills Zone

Marketing Channel of Sugarcane in the Mills Zone and Sugar distribution in Bangladesh

On the other hand, sugar produced in the sugar mills is distributed to final consumer via dealer, wholesaler and retailer. Government also distributes a significant portion of sugar directly to police/defense forces, through rationing and for industrial quota.

Marketing Channels of Sugarcane and Gur distribution in the non-mills zone of Bangladesh

In the non-mills zone, the study implies the following marketing channel of produced sugarcane and gur (Figure 2). Sugarcane produced by the farmers in the non-mills zone are sold to the gur makers, seed to the other farmers, seed use for own plantation and self gur production for their farming business. The produced gur is marketed to the final consumer via Paiker/Bepari, Aratder, wholesaler, retailer and directly to the Aratder, retailer and consumer.



Figure 2. Marketing channel of sugarcane and gur of non-mills zone

Marketing constraints faced by the farmers of TSM and RJSM zone for supplying sugarcane to the mills

Various problems are faced by the cane farmers of the two selected mills zone while selling their cane to the mills. These problems include difficulties in getting cane supply permit (purjee), reduced weighing problem, delay in dues payment, low price, transport, long distance cane centres and labour scarcity. Among them the severe problems of cane marketing accounted for low price (100%) and reduced weighing problem (100%), followed by delay in dues payment (81.67%), long distance of cane centres (75%), difficult to get cane supply permit (73.33), transport (68.33%) and labour scarcity (58.33%) (Table 3).

Table 3. Marketing constraints of farmers to supply canes to the mills, 1999-2000.

Problems	Number of respondent		
	RJSM	TSM	ALL FARMS
1. Difficult to get supply permit	19 (63.33)	25 (83.33)	44 (73.33)
2. Reduced weighing	30 (100)	30 (100)	60 (100)
3. Delayed in dues payment	26 (86.67)	23 (76.67)	49 (81.67)
4. Low price of sugarcane	30 (100)	30 (100)	60 (100)
5. Transport	23 (76.67)	18 (60.00)	41 (68.33)
6. Long distance cane centre	25 (83.33)	21 (70.00)	45 (75.00)
6. Labour scarcity	12 (40.00)	23 (76.67)	35 (58.33)

Figures in the parentheses are the percentages of the respondent farmer.

Production and profitability of sugarcane marketing in the mills and non-mills zone

The study showed that farmers of the mills zone marketed their produced sugarcane supply to the sugar mills or sale to the gur makers. Estimated average per ha net return was found lower in mills zone (TSM and RJSM) area (Tk.16870.64) and comparatively higher net return was found in non-mills area (Sirajgang, Nawabgang and Gazipur) (Tk. 31535.05). On the other hand, there is no marketing cost involved when the farmers sold it to the gur makers or produce gur themselves in the non-mills zone. Farmers of the non-mills zone gets higher average per ha net returns though the cost involved for gur processing and lower yield from mills zone. Farmers also obtain higher BCR (1.74) in non-mills zone then mills zone (1.50) from sugarcane production (Table 4).

Table 4. Production and profitability of sugarcane marketing in the different study area of mills and non- mills zone in Bangladesh, 1999-2000.

Item	Mills Zone			Non-mills Zone			
	TSM	RJSM	All Farms	Sirajgang	Nawabgang	Gazipur	All Farms
Yield (tons/ha)	41.98	42.63	42.31	58.94	26.65	39.35	41.65
Price (Tk./ton)	1181.01	1211.00	1196.01	1531.00	1660.00	1700.00	1630.33
Gross Return (Tk./ha)	49578.62	51624.98	50601.80	90237.14	44272.20	66895.00	67134.78
Production Cost (Tk./ha)	29887.21	30459.21	30173.21	34203.47	34095.31	38500.40	35599.73
Marketing Cost(Tk./ha)	3074.40	4041.50	3557.95	-	-	-	-
Total Cost (Tk./ha)	32961.61	34500.71	33731.16	34203.47	34095.31	38500.40	35599.73
Net Return (Tk./ha)	16617.01	17124.27	16870.64	56033.67	10176.89	28394.60	31535.05
Benefit Cost Ratio	1.50	1.50	1.50	2.64	1.30	1.74	1.89

Marketing cost and margin of Sugar and Gur marketing for different intermediaries

No middleman exists in sugarcane marketing by the sugar mills in Bangladesh. Sugarcane is supplied directly to the sugar mills or sold to the gur manufacturers or used for gur production by the farmers. Due to the absence of marketing intermediaries sugarcane have found no marketing margin unless it produced or changes its form to sugar and gur. Data have been collected from 30 samples of sugar marketing intermediaries in Dhaka and Rajshahi Metropolitan City and 30 samples of gur marketing intermediaries from the Natore District. Bangladesh Sugar & Food Industries Corporation (BSFIC) is the only sole authority to produce/import sugar and marketed through dealers/ commission agent in Bangladesh. The study showed that marketing cost of sugar per ton was higher for dealer (Tk.647.95) followed by retailer (Tk.472.75) and wholesaler (Tk. 333.51) respectively. Gur marketing cost per ton was found higher for wholesaler (Tk.687.66) followed by 'Paiker' (Tk.481.82), retailer (Tk.385.96) and 'Aratder' (Tk.252.25)

respectively (Table 5). The study also showed that per ton sugar marketing margin was found higher for retailer (Tk.2819.25) followed by wholesaler (Tk.765.49) and dealer (Tk.618.05) respectively. Gur marketing margin per ton was found higher for retailer (Tk.1529.04) followed by 'Aratder' (Tk.1074.75), 'Paiker' (Tk.1003.18) and wholesaler (Tk.620.34) respectively (Table 6).

Table 5. Marketing cost of sugar and gur involving in different market intermediaries, 1999-2000.

Type of Intermediaries	Transport cost (Tk./ton)	Rent of shop/ Storage cost (Tk./ton)	Tax (Tk./ton)	Labour cost (Tk./ton)	Cost of Capital (Tk./ton)	Total Marketing cost (Tk./ton)
Sugar marketing:						
Dealer	380.76	109.24	36.34	42.28	79.33	647.95
Wholesaler	-	140.29	49.71	60.53	82.98	333.51
Retailer	320.74	-	-	65.86	86.15	472.75
Gur marketing:						
Paiker/Bepari	348.48	-	51.92	36.58	44.84	481.82
Aratder	-	148.34	52.67	51.24	-	252.25
Wholesaler	394.45	142.85	56.34	40.78	53.24	687.66
Retailer	274.57	-	-	54.38	57.01	385.96

Table 6. Marketing margin of sugar and gur marketing for different intermediaries, 1999-2000.

Type of Intermediaries	Purchase price (Tk./ton)	Sale price (Tk./ton)	Gross margin (Tk./ton)	Marketing cost (Tk./ton)	Net margin (Tk./ton)
Sugar Marketing:					
Dealer	27500	28765	1265	647.95	618.05
Wholesaler	28765	29864	1099	333.51	765.49
Retailer	29864	33156	3292	472.75	2819.25
Gur Marketing:					
Paiker/Bepari	15545	17030	1485	481.82	1003.18
Aratder	17130	18457	1327	252.25	1074.75
Wholesaler	18457	19765	1308	687.66	620.34
Retailer	19765	21680	1915	385.96	1529.04

Marketing Efficiency

The marketing efficiency for different intermediaries of sugar and gur were determined by an approach introduced by Shephard and presented in Table 7. In case of sugar marketing, the efficiency of wholesaler was found higher (98.88%) followed by retailer (98.58%) and dealer (97.75%). The reason was that the wholesaler had no transportation cost. On the other hand, marketing the efficiency of gur was found higher for Aratder (98.63%) followed by retailer (98.22%), Paiker (97.17%) and wholesaler (96.52%). The reason that the Aratder had no transportation cost. The calculated figures of marketing efficiency of sugar and gur stated that any value higher than ranges from

96.52-98.88 percent would be accompanied either by a decrease in marketing cost or by an increase in the sales value of sugar and gur. So any value higher than those percent would result in a higher efficiency of the marketing system compared to the present situation i.e. the higher the value of efficiency implies the more efficient marketing system.

Table 7. Marketing efficiency of different intermediaries of sugar and gur as per Shepherd, 1999-2000.

Type of Intermediary	Marketing Efficiency
Sugar Marketing :	
Dealer	97.75
Wholesaler	98.88
Retailer	98.55
Gur Marketing :	
Paiker/Bepari	97.17
Aratder	98.63
Wholesaler	96.52
Retailer	98.22

Policy Implication

Sugarcane marketing in the mills zone area are under control of Bangladesh Sugar & Food Industries Corporation (BSFIC) and it is the monopoly market of the BSFIC. Monopoly of BSFIC resulted deprived from fair price of produced sugarcane of the cane farmers in the mill zones. On the other hand, the farmers of the non-mills zone sold their sugarcane at higher price than mills zone in open market operation. The government should formulate an effective sugarcane marketing system so that the fair price of sugarcane will be ensured for the farmers of mills zone and which also provide an efficient sugar and gur marketing in Bangladesh.

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