

Economics of Sugar Industries Performance in Bangladesh

M.M. Alam, M.I. Haque and G.M. Monirul Alam

Bangladesh Sugarcane Research Institute,

Ishurdi, Pabna, Bangladesh.

Received on 10.5.2006

ABSTRACT

In Bangladesh as a developing and labour intensive country, the performance of sugar industry in the sphere of socioeconomic condition connotes special significance. More than 0.6 million farm-families are dependent on this sector for their subsistence. The economy mainly of northern region, of the country largely depends on sugar industry. Every year the sugar industry is incurring a huge amount of losses for which the industries are making them questionable on its existence to the public and the policy makers. Hence, the present study was conducted in 2003-04 crushing season to identify the major causes/factors affecting losses of sugar industries in Bangladesh, estimate the growth trend of sugar industry performance after its establishment, determine the break-even point and to formulate recommendation for obtaining profit of the sugar industry. The finding of the study is expected to help all kinds of stakeholder to make the industry viable.

Key words : Sugar industry, performance, break-even point, profit and loss, capacity utilization, management gap.

INTRODUCTION

The place of sugar industry in Bangladesh among agro-based industries is next only to jute industries. More than 0.6 million farm-families are dependent on this sector for their subsistence. These industries are providing employment for nearly 17000 persons (BSFIC, 2005). Besides, due to cultivation of sugarcane, which is a labour-intensive crop, huge number of jobs are being created every year both for the family and hired labourers in growing sugarcane. Most of the country's 15 sugar mills are located in the North-western zones of the country where concentration of growing sugarcane is high. Currently, on an average the principal raw materials, sugarcane, for producing sugar is grown in 0.18 million hectare of land of which almost 50% is located in the sugar mills zones, where sugarcane is mostly used for sugar production and remaining 50% is situated in the non-mill zone, where sugarcane is mostly diverted for gur and juice production (Bench mark survey of Sugarcane, 1996). Sugar industry added value to final output in the form of sugar and its by-product. Further it is value added in our national economy when the final output is marketed to the consumer via dealer (distributor, wholesaler and retailer). So there is a wide scope for increase in production of sugar and its by-product through sugarcane processing which will not only to meet up our growing demand of sugar but also to increase the national Gross Domestic Product (GDP). Furthermore, sugar industry plays an important role to develop infrastructure in rural areas, rural employment,

income of the farm families, contributes to national exchequer, foreign exchange saving, poverty reduction and value addition to the sugar as well as by-product industries (Alam, 2006).

Sugar is indispensable for health and if it is not taken directly, it must be taken from other sources of carbohydrates in the food. Since sugar, as it is called, a cheap source of instant energy, a person should take it liberally. According to the nutritionists (CSIR, 1957), "A person requires a minimum of 44 lb (20 kg) of sugar or equivalent quantity of gur per year in his (or her) diet". It is believed that there is a strong positive relation between total sugar consumption and health standard of a nation. Per capita consumption of sugar in Bangladesh is also lowest in the world, even among the neighbouring SAARC countries as India, Pakistan and Nepal. Per capita consumption of sugar is very much important in the context of health, IQ, calorie intake of a nation. The present low per capita consumption of sugar would indicate our low profile economic status. Hence, it is necessary to produce more domestic sugar and gur to maintain our minimum health standard.

The sugar industry of Bangladesh is passing its crisis period due to incurring a huge amount of losses every year. At present 15 sugar mills are in operation under BSFIC with a capacity of 200400 MT of sugar production per year (BSFIC, 2004). The probable causes of losses due to the under utilization of sugar production capacity, inadequate cane supply to the sugar mills, low sugar recovery, high sugar processing cost incurred, and the overall management deficiencies. This issue of cumulative losses has been a serious concern among employees of sugar industry, scientists of the sugar community, policy makers and the animate people of the country. The present study will investigate the probable causes of losses in the sugar industries of Bangladesh and determine the factors that could make profitable or either break-even point for smooth running the sugar industry. The findings of the study will be useful to the millers, employees, public, donor agency and policy makers to make the industry viable.

MATERIALS AND METHODS

All sugar mills of Bangladesh were selected for the study. Data were collected mainly from the secondary sources. Data requirements were in terms of : (1) Sugar production capacity (MT), 2) Sugarcane area in hectare, 3) Sugarcane production and supply to the mills (MT), 4) Sugar production (MT) with sugar recovery percentage, sugarcane price (Tk./MT), sugar processing cost (Tk./MT), adoption of sugar production technology and profit/losses of sugar industries of Bangladesh from 1971-72 to 2003-04 crushing years (BSFIC, 1972-2004). These data and information were generally collected from published sources like annual report/MIS report of BSFIC, BSRI, DAE, DAM, BB and BBS. Descriptive statistics and time series data used to analyse the data of the project.

Analytical Model

The analytical models used for the purpose of economics of sugar industry performance in Bangladesh by the following methods:

1. Growth trend in sugarcane area, production, factory supply, sugar production, capacity utilization, and recovery % by the exponential function as :

$$y = ae^{bt} \text{ or } \log e^y = \log e^a + bt$$

Where,

y = Sugarcane area, production, factory supply, sugar production, capacity utilization, and recovery %.

t = time period, and

$e^b - 1$ be the compound growth rate.

2. Break even analysis of sugar production done by the following method (Charles *et al.*, 2002):

i) Break-even Point (in unit) = Fixed Cost/ Sales (Per unit)- Variable Cost (Per unit)

ii) Break-even Point (in Taka) = Fixed Cost X Sales / Contribution Margin

Where, Contribution Margin = Sales price - all variable expenses

iii) Equation Technique:

Sales - Variable expenses - fixed expenses = Net income

Where, At the breakeven point net income is zero and let N = number of units to be sold to breakeven. Then the equation expressed as: Unit sales price X N - Unit Variable cost X N - fixed cost = Net income.

RESULTS AND DISCUSSION

Performance of Sugar Industries in Bangladesh

Performance of sugar industries measured by the growth rate of sugarcane cultivation area in ha, sugarcane production, sugarcane supply to the sugar mills, sugar production, sugar recovery percent, sugarcane price. Again growth rate is estimated with time series data from 1971-72 to 2003-04, by using exponential growth rate model.

It is observed from the study that growth rate of cane cultivation area, sugarcane production, yield, cane crushing, sugar production and recovery are 1.20, 2.90, 1.60, 2.70, 2.60 and 0.00 respectively (Table 1). The growth rates are not at expected level, because crops sector growth rate (2002-03) was 2.88 and industry sector was 6.75 (BES, 2004) which means that sugar industries growth rate was below during these period. This below growth rate is obviously turned down the industries low profile economic performance and incurred a huge losses to the industries.

Table 1. Sugar industries performance in Bangladesh (1971-72 to 2003-04).

Crushing Season	Total Sugarcane Cultivation (ha)	Total Production (Ton)	Yield (Ton/ha)	Total Sugarcane Crushing (Ton)	Total Sugar Production (Ton)	Recovery (%)	Sugarcane Price (Ton)
1971-72	55109	1139785	20.68	409160	24200	5.92	267.92
1972-73	47663	1103552	23.15	274310	19604	7.14	267.92
1973-74	56847	2104241	37.02	1187202	89808	7.56	267.92
1974-75	70970	2206104	31.09	1422181	100040	7.02	267.92
1975-76	50542	1668517	33.01	1100946	88177	8.1	267.92
1976-77	65865	2389199	36.27	1706370	140925	8.26	321.51
1977-78	96022	3271953	34.08	2309652	178072	7.72	321.51
1978-79	75975	2573833	33.88	1715505	132812	7.74	321.51

Table 1. Continued

Crushing Season	Total Sugarcane Cultivation (ha)	Total Production (Ton)	Yield (Ton/ha)	Total Sugarcane Crushing (Ton)	Total Sugar Production (Ton)	Recovery (%)	Sugarcane Price (Ton)
1979-80	62965	2203112	34.99	1272089	94714	7.46	321.51
1980-81	77370	2833317	36.62	1826731	145205	7.93	401.88
1981-82	94969	3748431	39.47	2473301	202158	8.17	401.88
1982-83	99280	3925136	39.54	2216939	181355	8.18	401.88
1983-84	95902	3388795	35.34	1899831	151353	7.97	455.47
1984-85	94034	3136846	33.36	1176599	87849	7.48	509.05
1985-86	73789	2998799	40.64	1018202	82498	8.11	616.22
1986-87	85915	4132368	48.10	2286650	181925	7.95	643.01
1987-88	94299	4329241	45.91	2199389	178260	8.1	643.01
1988-89	91866	3767600	41.01	1330320	110000	8.27	723.39
1989-90	85476	4019565	47.03	2096203	183862	8.77	991.31
1990-91	95459	4695510	49.19	3105918	246493	7.93	991.31
1991-92	95501	4491122	47.03	2390251	195587	8.18	991.31
1992-93	87966	4246613	48.28	2233114	187483	8.4	991.31
1993-94	92250	4576394	49.61	2699901	221547	8.21	991.31
1994-95	99004	5030449	50.81	3482741	270196	7.76	991.31
1995-96	95942	4340890	45.25	2383481	183934	7.71	991.31
1996-97	86575	4097854	47.33	1763153	135320	7.67	991.31
1998-98	88130	4191153	47.56	2121845	166457	7.84	991.31
1998-99	94352	4123740	43.71	2313806	152979	6.61	991.31
1999-00	86397	3526498	40.82	1612320	123498	7.66	991.31
2000-01	74873	3361867	44.90	1369026	98355	7.18	1098.48
2001-02	88274	4475990	50.71	2811123	204329	7.27	1098.48
2002-03	105417	4595268	43.59	2633432	177398	6.73	1098.48
2003-04	84866	3948244	46.52	1642510	119146	7.26	1098.48
Growth Rate (%)	1.20	2.90	1.60	2.70	2.60	0.00	5.30

Source: MIS Report, BSFIC, 2005.

Profit and Loss of Sugar Industries in Bangladesh (1971-72 to 2003-04)

At present 15 sugar mills are in operation under BSFIC with a capacity of 200400 MT of sugar production per year. Sugar industry in Bangladesh is a loosing concern now. The present study considered 32 crushing season (from 1972-73 to 2003-04). The industry makes profit of Tk. 2115.91 million in 13 crushing seasons and bears losses of Tk. 11315.83 million in 19 crushing seasons. Net loss of the industry is Tk. 9199.92 million but the industry provided Tk. 26134.22 million to the national exchequer as VAT, Tax, Excise Duty, Lavy, etc in these 32 crushing seasons (Table 2).

Table 2. Profit and loss of sugar industry in Bangladesh (1972-2004).

Crushing season	Sugar production (MT)	Recovery (%)	Profit (Tk. in million)	Loss (Tk. in million)	Revenue to the national exchequer (Tk. in million)
1972-73	19295	6.62	-	29.35	11.16
1973-74	88375	7.56	50.20	-	52.78
1974-75	98466	7.62	50.52	-	191.27
1975-76	86788	8.01	30.27	-	210.37
1976-77	138707	8.26	83.90	-	307.42
1977-78	178072	7.72	6.85	-	450.95
1979-79	130720	7.74	7.40	-	441.58
1979-80	93224	7.46	53.02	-	423.86
1980-81	142918	7.93	262.12	-	681.95
1981-82	202168	8.17	413.08	-	825.55
1982-83	181355	8.18	411.82	-	871.64
1983-84	151353	7.97	422.46	-	858.25
1984-85	87849	7.48	-	307.53	368.26
1985-86	82498	8.11	-	382.68	591.90
1986-87	181925	7.95	-	397.73	1050.61
1987-88	178260	8.10	-	175.01	665.01
1988-89	110000	8.27	-	241.30	667.72
1989-90	183862	8.77	245.38	-	855.58
1990-91	246493	7.93	-	95.94	1293.60
1991-92	195587	8.12	-	655.74	1306.19
1992-93	187483	8.40	-	829.49	874.70
1993-94	221547	8.21	-	252.51	1127.05
1994-95	270196	7.76	78.89	-	1046.06
1995-96	183934	7.71	-	379.28	1344.08
1996-97	135000	7.67	-	659.19	1802.80
1997-98	166000	7.84	-	385.73	1794.55
1998-99	153000	6.61	-	1305.90	1771.03
1999-00	123000	7.66	-	1117.71	1382.76
2000-01	98350	7.18	-	1352.26	1358.25
2001-02	204329	7.27	-	1181.19	858.70
2002-03	177398	6.67	-	972.49	299.49
2003-04	119146	7.26	-	594.80	349.10
Total :		26134.22	2115.91	11315.83	26134.22

Source: Annual Report, BSFIC, 2005.

Break-even Analysis

Break-even is the point at which sale price is equal to production cost and there is no loss no profit situation (Total revenue = Total cost). Break-even point of sale price, recovery and sugar production of 14 crushing season (1989/90 to 2002/03) has been estimated in this study. Almost in every year during the period, the sugar industries incurred a huge loss except the year 1989/90 and 1994/95 crushing season (Table 3). The table shows that in most of the year the sale price of sugar is less than cost of production that incurred loss to the industries. To make the break even point for the industries must have to achieve higher recovery and production of sugar. Break even for sale price represents the price that makes no loss no profit situation with a given recovery and production.

Similarly break even recovery represents the recovery rate that makes no loss no profit situation with given sale price and production and break even production represents the production level which makes no loss no profit situation with a given sale price and recovery rate.

It is observed from the study that break even recovery was more than eight in all the crushing season except 1994/95. It is also observed that break even recovery of 1999-2000 & 2000-01 crushing seasons was 10.12 and 10.33 respectively. This means that the sugar industry did not gain profit until the recovery rate raised to 10.12 and 10.33 in those two seasons respectively.

Table 3. Break even analysis of sugar industries (1988-89 to 2002-03).

Year	Capacity (MT)	Sugar Production (MT)	Capacity Utilization (%)	Recovery (%)	Sugar Production Cost (Tk./kg)	Sale Price (Tk./kg)	Break even point			Profit/Loss (million Tk.)
							Sale Price (Tk./kg)	Recovery (%)	Production (MT)	
1989-90	197910	183862	92.90	8.77	25.67	27.00	27.01	8.34	174751	245.38
1990-91	199250	246493	123.71	7.93	26.48	27.18	26.11	8.05	249974	-95.94
1991-92	199250	195587	98.16	8.18	28.59	25.00	25.25	9.27	221497	-655.74
1992-93	202050	187483	92.79	8.40	28.86	25.10	24.42	9.92	221545	-829.49
1993-94	202050	221547	109.65	8.21	27.74	26.50	26.59	8.56	231160	-252.51
1994-95	198440	270196	136.16	7.76	26.77	27.00	27.06	7.68	267345	78.89
1995-96	196440	183934	93.63	7.71	30.41	27.00	28.37	8.27	197134	-379.28
1996-97	210440	135320	64.30	7.67	33.79	27.00	28.94	8.96	158014	-659.19
1997-98	210440	166457	79.10	7.84	31.65	27.47	29.35	8.46	179495	-385.73
1998-99	210440	152979	72.69	6.61	36.57	27.47	28.04	8.62	199515	-1305.90
1999-00	210440	123498	58.69	7.66	37.19	27.47	28.14	10.12	163226	-1117.71
2000-01	210440	98355	46.74	7.18	45.09	27.47	31.36	10.33	141416	-1352.26
2001-02	210440	204329	97.10	7.27	34.29	27.47	28.50	8.74	245809	-1181.19
2002-03	210440	177398	84.30	6.73	32.92	26.50	27.46	8.07	212639	-972.49

Source : MIS Report, BSFIC, 2005.

Factors Affecting Losses of Sugar Industries in Bangladesh

Factors like management, environment and policy were identified as affects on losses of sugar industry in Bangladesh. Management factors resulted low yield and low sugar recovery percentage, high processing loss, excessive manpower, low capacity utilization and higher production cost in comparison to the other sugar based countries. Environmental factors are weather, sunshine suitability for sugar production. Policy factors are investment policy, taxes & vat, cane development, sugarcane price and subsidy. Per hector yield in Bangladesh is 46 ton only where as on an average 70 tons/ha in other sugar producing countries. Recovery percentage in Bangladesh is 7.0 to 8.5 only, but 8.5 to 11.0 in other countries (EU, Brazil, Australia, Thailand, Mauritius) even the provinces of neighboring country like India and Pakistan are also higher substantially. This low yield and recovery caused mainly for management factors in production level. Process loss (2.25 to 4.00), processing cost and manpower per TCD (1.25) in Bangladesh are highest in the world and capacity utilization is very low (76%). Environmental factors like weather of Bangladesh and sunshine period are not favorable for high recoverable sugar varieties due to Bangladesh lies in the subtropical zone but others high sugar producing country lie

in the temperate zone. Government policies like investment policy, taxes & VAT, sugar cane development policy, sugarcane price policy and subsidy policies are not helpful to the development of the sugar industries in Bangladesh. Dis-investment (two sugar mills already laid-off), high taxes & VAT, poor government assistance for cane development, low sugarcane prices and no subsidy in sugar industries resulted losing the sugar industries of Bangladesh (Table 4).

Table 4. Factors affecting losses of sugar industries in Bangladesh.

Factors	Bangladesh	Other Countries
A. Management Factors		
a) Per hector yield (MT)	46.00	70.00+
b) Recovery (%)	7.00 - 8.50	8.50 - 11.00 India: Maharastra – 10.00 Bihar – 9.00 Haryana – 10.50 West Bengal – 8.00 Pakistan: Sindh – 9.50 Panjab – 8.30 Frontier – 8.80
c) Processing Loss (%)	2.25 - 4.00	1.50 - 2.00
d) Processing Cost per Kg.	High	Low
e) Manpower per TCD	1.25	0.33 - 0.50
f) Capacity Utilization	76%	100%+
B. Environmental Factors		
a) Agro-ecological Zone	Subtropical	Temperate
b) Weather	Limitation for high sugar variety	Suitable for high sugar variety
c) Sunshine	6 Hrs.	8-12 Hrs.
C. Policy Factors		
a) Investment Policy	Dis-investment	Investment
b) Taxes & VAT	High Taxes & VAT	No Taxes
c) Cane Development	BSFIC	Government
d) Sugarcane Price	Low Price	High Price
e) Subsidy	No Subsidy	Subsidized

Source: MIS Report, BSFIC, 2005; USDA Report, 2004 (USA).

Management Gap

Management gap was an important aspect of profit and losses to the sugar industries in Bangladesh. Sugar mill was under private management before liberation in 1971. The crushing seasons from 1957/58 to 1969/70 has considered as private management period for the study. It is observed that private management is more efficient than public management in respect of capacity utilization, sugar production and recovery rate. During the period, it was observed that private sugar industries average annual production of sugar was 28798 MT as against installed capacity of 30538 MT and utilization capacity was 91.01%, where as public sugar industries average annual production of sugar was 45286 MT as against installed capacity of 74230 MT and utilization capacity was 55.77%. But during this period the private sector achieved 8.01%

recovery and the public sector achieved only 7.45% of sugar recovery, which means that the public sector is less efficient than private sector (Table 5). That's why there was a wide management gap between private and public sugar industries in Bangladesh. At present, there is no private sugar industry in Bangladesh. Henceforth, for the improvement of sugar industries there are a scope of reducing management gap in respect of sugar yield and recovery by using BSRI varieties and technologies.

Table 5. Management gap between private and public industries (EPIDC) during the period (1957-58 to 1969-70).

Year	Installed Capacity (MT)		Actual Production (MT)		Percentage Utilization of Capacity (%)		Actual Recovery (%)	
	Private	Public	Private	Public	Private	Public	Private	Public
57-58	39000	15000	31917	797	81.84	5.31	9.06	5.72
58-59	39000	40000	43908	10792	112.58	26.98	8.61	7.17
59-60	39000	40000	39253	22307	100.64	55.77	7.87	7.84
60-61	39000	40000	33579	20537	86.10	51.34	8.64	8.55
61-62	39000	40000	37731	28914	96.75	72.28	8.37	8.52
62-63	39000	60000	39968	32618	102.48	54.36	8.18	8.04
63-64	39000	60000	43125	44605	110.58	74.34	8.04	7.77
64-65	39000	60000	37607	36541	96.43	60.90	7.56	7.04
65-66	17000	112000	16625	67864	97.79	60.58	8.17	7.71
66-67	17000	112000	16510	96456	97.12	86.12	7.74	7.54
67-68	17000	122000	15288	94701	89.93	77.62	7.67	7.62
68-69	17000	122000	5716	52334	33.62	42.90	7.04	6.64
69-70	17000	142000	13142	80255	77.31	56.52	7.25	6.70
Aveg.	30538	74230	28798	45286	91.01	55.77	8.01	7.45

Source: MIS Report, BSFIC, 2005.

How to make sugar industry profitable

To make sugar industries viable in Bangladesh the following recommendation may be considered. Instead of BSFIC, the Government may do sugarcane development and infrastructure development in mills zone as in India and Pakistan. Sugarcane extension and development under Government may reduce losses of Tk. 400-500 million per year, which was borne by BSFIC. Inter-cropping with sugarcane, ratoon management and incentive price of sugarcane should be introduced which may increase sugarcane supply to the factory and mills capacity utilization and thus augment sugar production. Incentive sugarcane price as for rice and wheat should be introduced. Government must have to invest in sugar industries and introduce subsidy on sugarcane and sugar production in Bangladesh like other sugar producing countries of the world.

Table 6. Summary recommendations

Particulars	Recommendation
Sugarcane Development in the Mills Zone	Responsibilities for cane development activities should be given to the Government extension service (DAE) like India, Pakistan; which on an average was reduce cost of Tk. 500 million of BSFIC.
Infrastructure development expenditure in the mill zones	Infrastructure Development in the Mills Zone should also be done by the LGRD ministry, which will reduce Tk. 60-70 million per year of BSFIC. In recent years Government has withdrawn the road development cess.
Sugarcane Intercropping	At least 25% areas should cover by intercrop with sugarcane.
Ratoon Management	At least 50% areas should cover by sugarcane ratoon.
Sugarcane Price	To introduce incentive cane price to the sugarcane farmers like rice and wheat.
Sugar Recovery Percent	Present recovery % should be increased at least to 9%.
Cost of Production	Sugar processing cost must be reduced by reducing manpower, overtime to the workers and other overhead costs.
Factory efficiency	By increasing productivity of sugar production and cost effectiveness.
Subsidy	Subsidies for sugarcane production inputs and subsidies for sugar industries should be introduced like other sugar producing countries. Presently Government has increased subsidies on small scale on sugarcane from 2003-04 planting season which should be increased.
Investment Policy	Government should invest a significant amount for sugar industries, research and extension. VAT, Taxes, should also be reduced.

REFERENCES

- Alam, M.M. 2006. Performance of Sugar Industry in Bangladesh: A Critical Review. Unpublished MBA Master Paper, Bangladesh Open University, Gazipur, Dhaka, Bangladesh. p. 1.
- BES, 2004. Bangladesh Economic Survey, Finance Division, Ministry of Finance, Dhaka, Bangladesh. pp. 71-75.
- BSFIC, 1972-2004. Annual Report, Bangladesh Sugar and Food Industries Corporation, 115-120, Motijhill C/A, Dhaka-1000, Bangladesh.
- BSFIC, 2004. Annual Report, Bangladesh Sugar and Food Industries Corporation, 115-120, Motijhill C/A, Dhaka-1000, Bangladesh, pp. 10-17.
- BSFIC, 2005. MIS Report, Bangladesh Sugar and Food Industries Corporation, 115-120, Motijhill C/A, Dhaka-1000, Bangladesh, pp. 15-19.
- Charles T. Horngren, Gary L. Sundem and William O. Stratton, 2002. Introduction to Management Accounting. New Delhi-110 001, India. pp.54-63
- CSIR, 1957. The Wealth of India: Industrial Products - part IV, Council of Scientific and Industrial Research, New Delhi, India. p.182.
- Kranti Associates, 1996. Benchmark Survey on Sugarcane, Dhaka, Bangladesh, pp. 10-12.
- USDA, 2004. Sugar: World Markets and Trade, May 2004, USA. pp. 5-10.