



Performance Analysis of Private Sector Sugar Industries in Tamil Nadu

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Abstract

Sugar Industry faces many problems such as fluctuations in the production due to inadequate availability of sugarcane and power failure. The profitability of the sugar industry comparatively very low because of high cost of production. In fact, some units are incurring losses continuously. The industry has failed to retain more profits, consequently been forced to depend more on external sources. Hence, it is necessary to study the Production and Sales performance of selected private sector sugar industries in Tamil Nadu.

Keywords: Annual Production, Annual Sales, Profit, Sugar Recovery, Mean, SD, CV, CAGR.

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Introduction

India is the largest consumer and the second largest producer of sugar in the world. The sufficient and well distributed monsoon rains, rapid population growth and substantial increase in sugar production capacity have combined to make India the largest consumer and second largest producer of sugar in the world.

The Indian sugar industry is a key to the rural development, supporting India's economic growth. The industry is inherently inclusive supporting over fifty million farmers and their families, in an era where there is a need for inclusive growth. It has done so by commercially utilising the rural resources to meet the large domestic demand for sugar and by generating surplus energy to meet the increasing energy needs of India. In addition to this, the industry has become the mainstay of the alcohol industry, and delivers value addition at the farm side. In general, sugarcane price accounts for approximately seventy percent of the ex-mill sugar price. The Indian sugar industry is characterised by the coexistence of private, cooperative and public sector. It is rural centric and hence a key driver of village level wealth creation. It has tremendous transformational opportunities to meet food, fuel and power needs and earn carbon credit. Tamil Nadu is one of the major sugar producing states in India and it contributes on an average of nineteen lakhs tonnes of sugar annually, which is about ten per cent of the total

production of sugar in the country. Tamil Nadu comes under low recovery zone with recovery hovering around nine per cent. Agro processing units including sugar units are equally plagued by the problem of sickness. The sugar industry is beset with a number of problems like shortage of sugarcane, obsolete technologies, under utilisation of capacity, payment of high state advised price, high cost of production etc.,

There are many studies conducted at macro level to deal with the entire economy. Such studies pertain to a sector or an industry and very few studies are conducted at micro level. But the financial performance of selected private sector sugar industries in Tamil Nadu has received only scant attention. Moreover, a comparative study on performance appraisal of some of private sector sugar companies in a key industry would help to understand the major constraints faced by the sugar manufacturers.

Review of Literature

Beate Zimmermann and Jurgen Zeddies (2002) presented an article on "International Competitiveness of Sugar Production". In this article the competitiveness of sugar production in the most important sugar producing countries is analysed, including the whole production process from beet or sugar cane production in the field to sugar processing in the factory. Special emphasis is focused on the different location factors and their influence on competitiveness, so that finally, conclusions can be drawn on future development of the world sugar market and the single production locations. From the countries included in this study, at present only Brazil, Australia, Thailand and partly South Africa would be

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able to produce sugar under world market conditions. They concluded that Brazil and Australia derived profit from favourable natural, economical and political location factors, in Germany high opportunity costs as well as high environmental and social standards predominate to the advantages of high efficiency in the sugar industry. In the United States partly disadvantageous climatic conditions together with high opportunity costs are responsible for the insufficient international competitiveness of sugar production. Low productivity in Thailand and South Africa is overbalanced by low wages as well as comparatively low environmental and social standards.

Prakash Rao and Venkateswara Rao (2005) examined the "Problems and Prospects of Sugar Industry in India". An attempt has been made to examine the problems and prospects of sugar industry in India. Though the industry contributes a lot to the socioeconomic development of the nation, it is plagued with a number of problems such as cyclical fluctuations, high support prices payable to farmers, lack of adequate working capital, partial decontrol and the uncertain export outlook. Despite the problems, the industry has good growth potential due to steady increase in sugar consumption, retail boom and diversification into areas such as power generation and production of ethanol.

Bhagat and Dilip Jain (2007) in their Study "Indian sugar Industry – An overview" discussed the structure, size and influence of Indian sugar industry on world sugar market and presented an overall view of the sugar industry and its socio – economic impact. The paper highlighted the Indian sugar industry scenario, technology issues, efficiency improvement, by product usage and environmental safeguards addressed by the Indian sugar mills. The authors also presented the engineering and institutional support available for its sustainable growth.

Sunil Chaudhary (2008) prepares a report on "Sugar Industry in India". He concluded his study by the sugar industry will not be lacking in meeting the requirement of ethanol. In a market economy, there would be a considerable shift from the Gur and Khandsari sectors which are inefficient producers with poor quality. In the current scenario of glut in sugar production, it may be advisable to divert such additional cane for the production of alcohol after meeting the sweetener requirement. The additional availability of alcohol on the assumption that the entire sugar cane is utilised for the production of sweeteners will be about 200 million litres over and above. Alternatively, if additional sugar cane available is utilised for the production of alcohol to bring in a balance in the demand and supply of sugar, the alcohol production at the end of the 10th plan would be around 1,485 million litres. Such flexibility has become very relevant in the current scenario of economy liberalisation and more particularly as a means to correct the aberrations in sugar production.

Goncharuk and Anatoliy (2009) in his article entitled that "How to make sugar production more

effective: A case of Ukraine" is devoted to the analysis of efficiency of sugar companies of Ukraine and the ways of its improving. The main factors of sugar plants inefficiency are defined and he finds that these problems have two sides: external and internal. The solving of external problems is not connected with actions of companies and depends on the government and its further policy in the field of regulation of agriculture and sugar production. The solving of internal problems of sugar companies depends on desire and abilities of their proprietors and management to manage a business performance. Recommendations for the improvement of efficiency of sugar companies and industry based on the study are the following; attraction of large foreign investors having high-efficiency technologies, own raw-material base (beet, raw sugar) and distribution channels abroad, and directed to increasing of labour productivity, reduction of wastage, improving of energy efficiency and decreasing of materials-output ratio.

Anuradha Rajendran (2009) undertook a study on "Performance Appraisal of Private Sector Sugar Companies in Tamil Nadu" for the period from 1997-98 to 2006-07. The main objectives of the study are to assess the production and sales performance, to analyse the financial performance and profitability analysis of selected sugar mills. Financial analysis techniques like ratio analysis and trend analysis are used to analyse the financial data. The correlation analysis revealed a positive correlation between return on total assets and inventory turnover ratio during the study period. The analysis of the operational efficiency using Altman's model reveals the financial health of the selected sugar industry falls in the healthy zone.

Statement of the Problem

Sugar Industry faces many problems such as fluctuations in the production due to inadequate availability of sugarcane and power failure. The profitability of the sugar industry comparatively very low because of high cost of production. In fact, some units are incurring losses continuously. The industry has failed to retain more profits, consequently been forced to depend more on external sources.

Need for the Study

The sugar industry has been facing the problems like improper supply of raw material, low crushing capacity, limited financial resources, lack of utilisation of technology etc. To cope with the present day situations a thorough understanding of production and sales performances is necessary to utilize the available limited resources, mobilization of resources efficiently and effectively. Hence, it is necessary to study the production and sales performances of selected private sector sugar companies in Tamil Nadu.

Objectives of the Study

The following are the objectives of the study:

1. To analyse the production and sales performance of selected private sector sugar companies in

Tamil Nadu.

2. To study the trends and growth of selected private sector sugar companies in Tamil Nadu.

Hypotheses

1. There is no significant difference between actual value and the trend value of consumption of sugar and yield of sugar cane except area, production of sugar cane, production of sugar and sugar recovery in the Indian sugar industry among different years.
2. There is no significant difference between actual value and the trend value of production of sugar in selected private sector sugar companies in Tamil Nadu among different years.
3. There is significant difference between actual value and the trend value of sales of sugar in selected private sector sugar companies in Tamil Nadu among different years.

Methodology

The present study is confined to six private sector sugar companies in Tamil Nadu namely Bannari Amman Sugars Ltd., Dharani Sugars and Chemicals Ltd., EID Parry (India) Ltd., Rajshree Sugars and Chemicals Ltd., Sakthi Sugars Ltd., and Thiru Arooran Sugars Ltd.,. The present study covers important aspects of production and sales etc of selected sugar companies. The study has been undertaken for the period of ten years from 2002-2003 to 2011-12 and mainly depend upon secondary data collected from the annual reports of selected private sector sugar companies in Tamil Nadu. The data has been analyzed with the help of financial and statistical tools like Mean, SD, CV, CAGR and Trend analysis.

Results of the Study

Analysis of Selected Variables of Sugar Industry

The analysis of performance can also significantly prove through the selected variables of a company or of the industries as a whole. All techniques have been adopted to appraise the performance of the sugar industries in this paper. An attempt has also been made to estimate trend co-efficients for selected variables of selected sugar industries in Tamil Nadu during the study period by fitting a linear regression model. The liner model fitted is as follows.

$$P = \alpha + \beta t + e$$

where P is rate of selected variables, t is the time and α and βt are the parameters [intercept and co-efficients respectively] and e is the error term.

Area, Yield, Production of Sugarcane, Production of Sugar, Consumption of Sugar and Sugar Recovery

The area, yield, production of sugarcane, production of sugar, consumption of sugar and sugar recovery of Indian sugar industry have been shown in table 1. The highest growth of area in the year 2006-07 is 118.12, yield (t/ha) is 108.82 of 2011-2012, sugarcane production (million tonnes) in the year 2006-07 is 126.26, production sugar (million tonnes) is 140.62 in

the year 2006-07, consumption of sugar(LT) in the year 2008-09 is 125.11 and sugar recovery (percentage) in the year 2007-08 is 101.83. The mean values of area, yield, production of sugarcane, production of sugar, consumption of sugar and sugar recovery of Indian sugar industry are 4500, 66.71, 298, 20.4, 201.42 and 10.223 respectively. The CAGR of area, yield, production of sugarcane, production of sugar, consumption of sugar and sugar recovery of Indian sugar industry which worked out as 0.0174, 0.0094, 0.0164, 0.0279, 0.0171 and -0.0021 respectively. The coefficient of variation indicates that the area, yield, production of sugarcane, production of sugar, consumption of sugar and sugar recovery of Indian sugar industry were moderately fluctuated during the study period.

It is evident from the table 2 the p-value is less than 0.01 per cent in consumption of sugar, the null hypothesis is rejected at one per cent level of significance and the p-value is less than 0.05 per cent in yield of sugar cane in Indian sugar industry; the null hypothesis is rejected at five per cent level of significance. Hence, there is significant difference between actual value and the trend value of consumption of sugar and yield of sugar cane except area, production of sugar cane, production of sugar and sugar recovery in the Indian sugar industry among different years.

Table 3 shows the trend movement of area, yield, production of sugarcane, production of sugar and consumption of sugar is 5463.38, 74.4655, 379.529, 28.5612 and 246.282 respectively. It will be highest for the year 2016-17 and the sugar recovery is 10.1527 in 2012-13. The area, yield, production of sugarcane, production of sugar and consumption of sugar will be the lowest in the year 2012-13 and the sugar recovery in the year 2016-17.

Analysis of Production of Sugar

The annual production of sugar by the private sugar companies in Tamil Nadu have been shown in table 4. The highest mean values of Bannariamman Sugar Ltd., is 685822 Mt., in EID Parry (India) Ltd., is 279445 Mt., and 195423 Mt. in Sakthi Sugars Ltd.,. The CAGR of annual production which worked out as 0.482 of Bannariamman sugars Ltd., is the highest in the selected private sector sugar companies. The coefficient of variation indicates that the annual productions of selected private sector sugar companies are moderately fluctuated during the study period.

It is clear from table 5 that, the p-value is less than 0.01 per cent production of sugar in Dharani sugars and Chemicals Ltd., the null hypothesis is rejected at one per cent level of significance and the p-value is less than 0.05 per cent in production of sugar in Bannariamman Sugars Ltd., the null hypothesis is rejected at five per cent level of significance. Hence, there is significant difference between actual value and the trend value of production of sugar in Bannariamman Sugars Ltd., and Dharani sugars and Chemicals Ltd., except EID Parry (India) Ltd., Rajshree Sugars and Chemicals Ltd., Sakthi

Sugars Ltd., and Thiru Arooran Sugars Ltd., among different years.

It is observed from table 6, the trend movement production of selected private sector sugar companies in Tamil Nadu for the year 2016-17, the production units will be the highest in EID Parry (India) Ltd., and followed by Sakthi sugars Ltd., The production units will be the lowest in Thiru Arooran sugars Ltd.,

Analysis of Annual Sales

The annual sales of sugar by the private sugar companies in Tamil Nadu have been shown in table 7. There was fluctuation in sales of sugar in all the selected sugar companies in Tamil Nadu. The highest mean values of EID parry (India) Ltd., is Rs.981 crores, in Sakthi sugars Ltd., is Rs.962 crores, and Rs.576.3 crores in Bannariamman Sugars Ltd., The compound annual growth rate of annual sales which worked out as 0.245 of Thiru Arooran Sugars Ltd., is the highest in the selected private sector sugar companies. The coefficient of variation indicates that the annual sales of selected private sector sugar companies are moderately fluctuated during the study period.

The results estimate of trend co-efficient for

sales of selected private sector sugar companies in Tamil Nadu presented in table 8. It is clear that, the p-value is less than 0.01 per cent annual sales of sugar in Dharani sugars and Chemicals Ltd., Rajshree sugars and Chemicals Ltd., Sakthi Sugars Ltd., and Thiru Arooran Sugars Ltd., the null hypothesis is rejected at one per cent level of significance. Hence, there is significant difference between actual value and the trend value of sales of sugar in Dharani Sugars and Chemicals Ltd., Rajshree Sugars and Chemicals Ltd., Sakthi Sugars Ltd., and Thiru Arooran sugars Ltd., except Bannariamman Sugars Ltd., and EID parry (India) Ltd., among different years.

The projections obtained for annual sales of selected private sector sugar companies in Tamil Nadu by linear growth models are listed in table 9. It shows the private sector sugar companies in Tamil Nadu have been growing marginally. The trend movement sales of selected private sector sugar companies in Tamil Nadu for the year 2016-17, the sales will be the highest in Sakthi sugars Ltd., and followed by EID Parry (India) Ltd., the annual sales will be the lowest in Bannariamman Sugars Ltd.,

Table- 1. Area, Yield, Production of Sugarcane, Production of Sugar, Consumption of Sugar and Sugar Recovery of Indian Sugar Industry (2002-2003 to 2011-2012)

Year	Area (ha)		Yield (t/ha)		Sugarcane Production (MT)		Production of Sugar (MT)		Consumption of Sugar(LT)		Sugar Recovery (per cent)	
	Actual	Growth	Actual	Growth	Actual	Growth	Actual	Growth	Actual	Growth	Actual	Growth
2002-03	4361	100	64.6	100	281.57	100	20.145	100	183.84	100	10.36	100
2003-04	3938	90.30	59.4	91.95	233.86	83.05	13.546	67.24	172.85	94.02	10.22	98.65
2004-05	3662	83.97	64.8	100.31	237.08	84.20	12.69	62.99	185	100.63	10.17	98.17
2005-06	4201	96.33	66.9	103.56	281.17	99.86	19.267	95.64	189.45	103.05	10.21	98.55
2006-07	5151	118.12	69	106.81	355.52	126.26	28.32	140.62	201.6	109.66	10.16	98.07
2007-08	5055	115.91	68.9	106.66	348.18	123.66	26.35	130.84	220	119.67	10.55	101.83
2008-09	4415	101.24	64.6	100.00	285.02	101.23	14.53	72.17	230	125.11	10.03	96.81
2009-10	4175	95.73	70	108.36	292.30	103.81	18.912	93.88	210	114.23	10.19	98.36
2010-11	4944	113.37	68.6	106.19	339.16	120.45	24.394	121.09	207.36	112.79	10.17	98.17
2011-12	5093	116.79	70.3	108.82	325.90	115.74	25.8	128.07	214.12	116.47	10.17	98.17
Mean	4500		66.71		298		20.4		201.42		10.223	
S.D	529		3.39		43.3		5.65		18.17		0.14	
CV	11.76		5.08		14.53		27.72		9.02		1.37	
CAGR	0.0174		0.0094		0.0164		0.0279		0.0171		-0.0021	

Source: Secondary Data

Table- 2. Estimates of Trend Co-Efficients for Area, Yield, Production of Sugarcane and Sugar, Consumption of Sugar and Sugar Recovery of Indian Sugar Industry (2002-03 to 2011-12)

S.No.	Particulars	$P = \alpha + \beta t + e$				p-value	S/NS
		α	βt	R^2	F-value		
1	Area (ha)	3941.47	101.46	33.7%	4.07	0.078	NS
2	Yield (t/ha)	62.22	0.816	53.2%	9.09	0.017*	S
3	Sugarcane Production (Mt.)	250.77	8.58	36%	4.50	0.067	NS
4	Production of Sugar (Mt.)	15.67	0.859	21.2%	2.15	0.181	NS
5	Consumption of Sugar(LT)	175.45	4.72	61.9%	13.02	0.007**	S
6	Sugar Recovery (per cent)	10.29	0.0128	6.9%	0.59	0.464	NS

** P<0.01 *P<0.05 S – Significant NS – Not Significant

Table-3. Projections for Area, Yield, Production of Sugarcane, Production of Sugar, Consumption of Sugar and Sugar Recovery of Indian Sugar Industry (2012-13 to 2016-17)

Year	Area (ha)	Yield (t/ha)	Sugarcane Production (MT)	Production of Sugar (MT)	Consumption of Sugar(LT)	Sugar Recovery (per cent)
2012-13	5057.53	71.2012	345.193	25.1242	227.393	10.1527
2013-14	5158.99	72.0164	353.777	25.9833	232.115	10.1399
2014-15	5260.45	72.8327	362.361	26.8426	236.837	10.1271
2015-16	5361.92	73.6491	370.945	27.7019	241.564	10.1143
2016-17	5463.38	74.4655	379.529	28.5612	246.282	10.1015

Source: Computed

Table-4. Annual Production of Sugar in Selected Sugar Companies in Tamil Nadu (2002-2003 to 2011-2012)

(in MT)

Year	Bannariamman		Dharani		EID Parry		Rajshree		Sakthi		Thiru Arooran	
	Actual	Trend	Actual	Trend	Actual	Trend	Actual	Trend	Actual	Trend	Actual	Trend
2002-03	105279	-675224	62515	41481	284136	227081	148108	129770	122176	105731	103867	101592
2003-04	38403	-372769	35280	56801	184559	238717	96505	136824	28291	125662	69688	104501
2004-05	37178	-70315	34329	72121	187521	250353	116147	143878	90549	145594	90286	107410
2005-06	94774	232140	113097	87441	317850	261990	193559	150932	284849	165525	161287	110319
2006-07	110513	534595	135399	102761	374811	273626	204580	157987	306209	185457	165724	113228
2007-08	76589	837050	143172	118081	256568	285263	179162	165041	215086	205388	107542	116136
2008-09	61394	1139505	94708	133401	248157	296899	139395	172095	169103	225320	99624	119045
2009-10	73655	1441959	103224	148721	213506	308536	140136	179149	122791	245252	70607	121954
2010-11	2635452	1744414	201030	164040	289746	320172	168743	186203	336538	265183	129795	124863
2011-12	3624987	2046869	181454	179360	437591	331808	228802	193258	278635	285115	148400	127772
Mean	685822		110421		279445		161514		195423		114682	
S.D	1309487		56754		80974		41073		104222		35118	
CV	190.94		51.40		28.98		25.43		53.33		30.62	
CAGR	0.482		0.126		0.049		0.050		0.096		0.040	

Source: Secondary Data

Table- 5. Estimates of Trend Co-Efficients for Production of Sugar in Selected Private Sector Sugar Companies in Tamil Nadu (2002-03 to 2011-12)

S.No.	Companies	$P = \alpha + \beta t + e$				p-value	S/NS
		α	βt	R^2	F-value		
1	Bannariamman	977679	302455	48.9%	7.66	0.024*	S
2	Dharani	26161.4	15319.9	66.8%	16.09	0.004**	S
3	EID Parry	215444	11636.4	18.9%	1.87	0.209	NS
4	Rajshree	122715	7054.22	27%	2.96	0.123	NS
5	Sakthi	85799.1	19931.6	33.5%	4.03	0.079	NS
6	Thiru Arooran	98682.7	2908.97	6.3%	0.54	0.485	NS

** P<0.01 *P<0.05 S- Significant NS – Not Significant

Table-6. Projections for Production of Sugar in Selected Private Sector Sugar Companies in Tamil Nadu (2012-13 to 2016-17)

(in MT)

Year	Bannariamman	Dharani	EID Parry	Rajshree	Sakthi	Thiru Arooran
2012-13	2349324	194680	343445	200312	305046	130681
2013-14	2651778	210000	355081	207366	324978	133590
2014-15	2954233	225320	366718	214420	344909	136499
2015-16	3256688	240640	378354	221475	364841	139408
2016-17	3559143	255960	389990	228529	384773	142317

Source: Computed

Table-7. Annual Sales of Selected Private Sector Sugar Companies in Tamil Nadu (2002-2003 to 2011-2012)
(Rs. in crores)

Year	Bannariamman		Dharani		EID Parry		Rajshree		Sakthi		Thiru Arooran	
	Actual	Trend	Actual	Trend	Actual	Trend	Actual	Trend	Actual	Trend	Actual	Trend
2002-03	345.55	514.333	134.790	32.224	1288.30	644.31	219.80	110.073	308.95	349.20	81.92	115.425
2003-04	467.31	528.095	81.500	101.114	560.37	719.17	161.22	169.040	290.09	485.43	127.36	171.629
2004-05	488.61	541.856	160.490	170.003	717.20	794.04	178.91	228.008	618.86	621.66	297.92	227.833
2005-06	632.64	555.618	315.390	238.893	926.18	868.90	256.01	286.975	879.86	757.89	298.71	284.036
2006-07	793.22	569.379	275.350	307.782	551.72	943.76	383.78	345.942	748.25	894.12	347.09	340.240
2007-08	524.72	583.141	198.540	376.672	616.45	1018.62	334.52	404.910	1023.16	1030.35	336.39	396.444
2008-09	698.84	596.902	222.610	445.561	755.57	1093.48	352.36	463.877	1372.82	1166.58	595.21	452.648
2009-10	877.04	610.664	578.310	514.451	1147.30	1168.35	522.01	522.844	2137.85	1302.81	428.10	508.851
2010-11	816.26	624.425	840.590	583.340	1536.65	1243.21	614.89	581.812	1121.27	1439.04	581.88	565.055
2011-12	118.41	638.187	614.699	652.230	1712.17	1318.07	730.76	640.779	1121.27	1575.27	588.84	621.259
Mean	576.3		342.2		981		375.4		962		368.3	
S.D	235.3		250.0		419		191.6		543		182.8	
CV	40.84		73.05		42.74		51.03		56.43		49.62	
CAGR	-0.112		0.184		0.032		0.143		0.154		0.245	

Source: Secondary Data

Table-8. Estimates of Trend Co-Efficients for Annual Sales of Selected Private Sector Sugar Companies in Tamil Nadu (2000-01 to 2010-11)

S.No.	Companies	$P = \alpha + \beta t + e$				p-value	S/NS
		α	Bt	R ²	F-value		
1	Bannariamman	500.57	13.76	3.1%	0.26	0.625	NS
2	Dharani	36.67	68.89	69.6%	18.32	0.003**	S
3	EID Parry	569.45	74.86	29.2%	3.3	0.107	NS
4	Rajshree	51.11	58.97	86.8%	52.78	0.00**	S
5	Sakthi	212.98	136.23	57.7%	10.91	0.01**	S
6	Thiru Arooran	59.22	56.20	86.7%	52.07	0.00**	S

** P<0.01 S- Significant NS – Not Significant

Table-9. Projections for Annual Sales of Sugar in Selected Private Sector Sugar Companies in Tamil Nadu (2012-13 to 2016-17)

(Rs. in crores)						
Year	Bannariamman	Dharani	EID Parry	Rajshree	Sakthi	Thiru Arooran
2012-13	651.948	721.119	1392.93	699.747	1711.50	677.463
2013-14	665.709	790.009	1467.79	758.714	1847.73	733.666
2014-15	679.471	858.898	1542.65	817.681	1983.96	789.870
2015-16	693.232	927.788	1617.52	876.649	2120.19	846.074
2016-17	706.994	996.677	1692.38	935.616	2256.42	902.278

Source: Computed

Conclusion

The above study generally indicates a moderate trend in the production and the sales, variations in area, yield, sugar production and recovery of sugar should be avoided. In recent years, sugar cane production in India has slow down due to water and power scarcity. In order to regular level of supply of water, all the area under sugar cane cultivation should be brought under drip irrigation. Drip irrigation equipments should be supplied free of cost by the government. Satisfactory and expected power supply to sugar cane growers and sugar factories would raise production and productivity. To boost the share of Indian sugar industry in global trade, quality and quantity of sugar need to be improved through modern technology. Hence efforts should be made to ensure a positive trend in the estimation and maintenance of the production and sales.

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