



COST MANAGEMENT IN CO-OPERATIVE SUGAR FACTORIES OF BIDAR DISTRICT

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ABSTRACT

The Indian Sugar Industry, with an annual production capacity of over 25 MMT, stands out to be the second largest in the world after Brazil, accounting for around 15% of the global sugar production. Sugar industry plays a leading role in Indian economy and especially it is connected with agriculture sector and sugar is the most essential food product. So cost reduction in sugar industry is need of time. In this situation key to success is finding creative ways to prevent cost so correct management of cost of production is must. This paper concentrate on how to reduce cost per unit (Quintal) of sugar manufacturing in co-operative sugar factories of Bidar district in Karnataka State. using the best practices of cost management techniques..

KEY WORD: Sugar Industry, Co-operative sugar factories, Cost Management Techniques.

1.INTRODUCTION.

Global sugar production exceeded 170 million tonnes (MT). Approximately 80% of the output was sourced from sugar cane and remaining 20% is produced from sugar beet, which is grown. The 10 largest sugar producing nations represent roughly 75% of world sugar production. Brazil alone accounts for almost 25% of world production. World consumption of sugar has also grown at an average annual rate of 2.7% over the past 50 years, driven mostly by rising incomes, population growth and changes in diet in the developing economies.

FAST FACTS: GLOBAL SUGAR INDUSTRY

- More than 123 countries produce sugar worldwide, with 70% of the world's sugar consumed in producer countries and only 30% traded on the international market.
- Around 170 MT of sugar are produced every year. The largest producers are Brazil (22%), India (15%) and the European Union (10%).
- About 20 % of global sugarcane production was used for ethanol production in 2012.
- The top five consumers of sugar use 51% of the world's sugar. They include India, the EU-27, China, Brazil and the US.



Fast Facts: Indian Sugar Industry

- **5 million hectares & 60 million sugar cane farmers and dependents Industry valued at `800 billion.**
- Estimated cane price payment for 2011-12 is 2.550 billion (Paid to farmers directly without involvement of any middlemen)
- Located in rural heartland, directly contributes to rural economic development and employment .

The following are the major inputs in production of sugar they are shown in **Table 2**

Table 2: Major Inputs in Production of Sugar

Particulars	% Share in Cost of Production
Land	32
Labour	32
Capital	13
Fertilizer	07
Others	16
Total	100

Source: Sugar India Year Book 2015

Table-2 Shows the share of major inputs in total cost of production of sugar. According to the same, around 64% cost of production is shared among land and labour. The least share is recorded by fertilizer, which is only 7%. The share of capital in cost of production was 13% and remaining share of 16% was spent on others.

Table: 3 Basic Information About Sugar Production In Karnataka

Particulars	Rs/kg
Sugarcane price payable for 2013-14 (Rs/quintal)	290 (Per Quintal)
Recovery Rate	11 %
Sugarcane price per kg of sugar produced	26.40
Conversion cost from Sugarcane to raw sugar	3.50
Total cost of raw sugar production	29.90.
Conversion cost from raw to white sugar	2.50.
Total cost of production for white sugar	32.40
Domestic ex-mill sugar price	26.10 to 26.60

Source: CRISIL Research Report 2015

This study is concerned how to minimize sugar manufacturing cost from factory point of view. The success of sugar factory depends on the decrease in cost per unit in competitive environment. Therefore to survive in cut-throat competition just control the cost; the next step is to reduce per unit cost without reducing quality. Here quality should be maintained but unit or single output cost per unit (marginal cost per unit) should be reduced to the possible extent using best and latest cost management techniques applied in production process.

2. REVIEW OF THE LITERATURE

A variety of independent studies have been devoted to the problems faced by the Indian sugar industry but an attempt is made to make a brief survey of some of the important studies which are as follows.

Gurupadaswamy M. S.¹ in his article discusses the role of co-operative sugar units in rural reconstruction. Almost all co-operative sugar factories established in the country have more or less the same organizational and operational frame provided through their bye-laws, in practice, the results are not uniform everywhere. In some of the states, co-operatives have not reached optimum level of efficiency which would give them a strong and sound base for becoming self-reliant. This may be due to lack of development in enterprise, lack of leadership, the texture of management, inadequate progress in farm

development etc. All these deficiencies need to be looked into from time to time. The individual sugar factories and their federations need to devote their attention to this task patiently and persistently. **Krishnaiah J.**² In his study assessed the cost composition in respect of labour (both human and bullock), seed, manures and fertilizers, irrigation and plant protection. In addition, input-output ratios when cane is sent to factory and converted to jaggery were also worked. On an average about 75% of the holdings is put to sugarcane, the average size of sugarcane farm being 1.33 hectare. The major inputs in orders of importance in sugarcane cultivation were labour (20.28%), seed (15.29%), manures and fertilizers (10.71%) and irrigation (5.99%). While the input-output ratio when cane is converted into jaggery was 1:2.07, it worked out to 1:1.29 when cane is sent to factory. This study revealed that jaggery production is more profitable than sugar production. This resulted a large scale diversion of cane to jaggery production in 1979-80 season. **Jain S. L.**³ highlighted Indian sugar industry and discussed the development of the industry during the plans, the industry's contribution to national economy and other related aspects of development and research in the area of sugarcane. **Anthony,**⁴ discussed regards cost control as cost management or cost containment and defined it as a broad set of cost accounting methods and management techniques with the goal of improving business cost efficiency, by reducing costs or at least restricting their rate of growth. Businesses use cost control methods to monitor, evaluate and ultimately enhance the efficiency of specific areas, such as departments, divisions or product lines within their operations.

3. HYPOTHESES OF THE STUDY.

The following are the hypotheses of the present study.

H₀₁: There is no significant difference between the Manufacturing Cost among the sugar companies under study.

H₀₂: There is no significant difference between Total Cost among the sugar companies under study

4. OBJECTIVE OF THE STUDY

The following are the objectives of the present study

1. To know what is cost management
2. To study in detail of cost of production in Co-operative sugar factories.
3. To offer suitable suggestions for cost control and cost reduction .

5. RESEARCH METHODOLOGY.

The present paper is based on secondary data which is collected from selected Co-operative sugar factories of Bidar district in Karnataka State. It is an empirical research in which the researcher has analyzed the cost of production. The percentage method has been used to analyze the cost elements. The secondary data which was compiled from three selected co-operative sugar factories for the period 2005-06 to 2014-15 has been used for analysis

Table : 4 Sugar factories profile which are selected for the study

Particulars	1.BSSK	2.NSSK	3.MGSSK
Location	Hallikhed S.F.) Taluk & District Bidar.	Imampur, Near Janwada Taluk & District Bidar.	Hunji , Bhalki Taluk, Bidar District,
Year of establishment	1961-62	2000-2001	2003-2004
Distance from Bidar	30 km	15 km	45 km
Capacity (TCD)	3500	2500	2500
Cane Crushed (Lakh M.T)			
Avg for 2012 to 2015	4.24	5.12	5.37
Sugar Recovery(%) Avg for	9.95	9.96	9.93

2012 to 2015			
Sugar Produced (Lakh/Qtl) Avg for 2012 to 2015	4.20	5.10	5.32

Sources: Sugar India Year Book 2015 and Annual Report of Factories.

6.WHAT IS COST MANAGEMENT ?

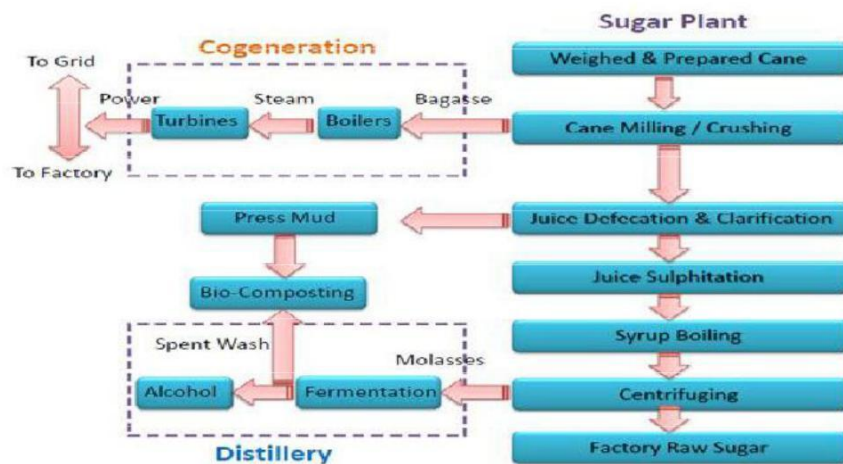
The cost management developed in response to limitations in traditional cost accounting. A new approach addressing this need ‘cost management’ combines familiar costing techniques with new methods of monitoring economic performance against plans. Instead of focusing attention on what occurred, cost management emphasizes the future impact of economic conditions. Thus, cost management is combination of cost accounting systems, tools and techniques and modern concepts and ideas that are recently developed for dealing with costs strategically⁵.

7.COST STRUCTURE IN CO-OPERATIVE SUGAR FACTORIES

The various commissions and committees were formed by the Government of India to examine and report on the cost structure of cooperative sugar mills and fair price of sugar payable to the company⁶. As per the Tariff Commission Report 1973 on the cost structure of sugar company and fair price of sugar payable to the company, the various elements that constitute the cost of production of sugar are as follows :

- 1) Cost of raw material, i.e., sugar-cane
- 2) Cost of power, fuel and stores
- 3) Taxes
- 4) Wages, salaries, bonus and other charges
- 5) Packing charges
- 6) Depreciation
- 7) Export loss and emergency risk insurance charges
- 8) Miscellaneous expenses
- 9) Research expenditure

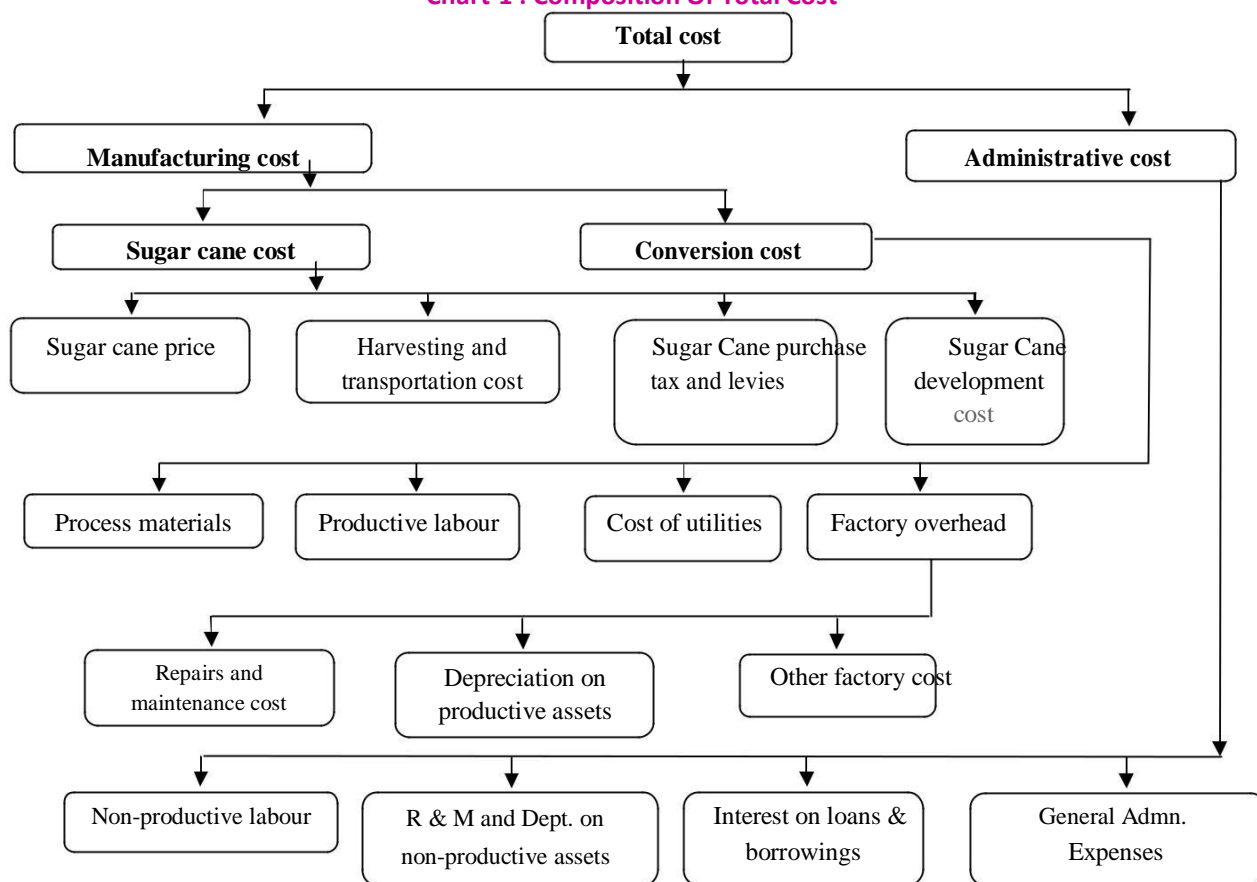
Following **Fig No.1** Shows the process of sugar manufacturing in sugar industry



Source: CRISIL Research Report

These costs are further classified into various sub-heads according to elements as shown in Chart-1 to facilitate accurate ascertainment of cost as well as analysis of cost trends in depth.

Chart-1 : Composition Of Total Cost



Source: V. Singh, "Scientific and effective cost structure of co-operative sugar industry", The sugar technologists Association of India" in 1996, (P- 99)

9.DATA ANALYSIS AND INTERPRETATION.

9.1.Percentage of Manufacturing Cost to Total Cost

The analysis of Manufacturing cost to total cost is most essential because it is major portion of cost of production in sugar production This percentage serves as an index of efficiency of production function as well as effectiveness of cost management. Higher percentage denotes that manufacturing cost is prominent component of total cost whereas the lower indicates that manufacturing cost is not a major contributor to total cost. The data pertaining to the percentage of manufacturing cost to total cost under study is given in

Table-5.

Table-5: Percentage of Manufacturing Cost to Total Cost

Year	BSSK			NSSK			MGSSK		
	MC (Rs. in Lakhs)	Total cost (Rs. in Lakhs)	Percentage	MC (Rs. in Lakhs)	Total cost (Rs. in Lakhs)	Percentage	MC (Rs. in Lakhs)	Total cost (Rs. in Lakhs)	Percentage
2005-06	5564.51	6306.79	88.23	7272.15	7363.90	98.75	3139.21	3654.55	85.90
2006-07	5535.43	6474.93	85.49	8440.90	8549.03	98.74	4149.67	4852.53	85.52
2007-08	6888.95	7671.25	89.80	7684.14	7809.61	98.39	5168.05	5824.69	88.73
2008-09	5203.02	6287.08	82.76	7182.30	7302.14	98.36	5107.75	5919.75	86.28

2009-10	9690.38	10891.04	88.98	12096.55	12403.43	97.53	10824.44	11743.04	92.18
2010-11	8453.36	9641.55	87.68	10684.33	11026.12	96.90	11244.69	12532.95	89.72
2011-12	12926.45	15082.51	85.70	15121.16	15449.91	97.87	13476.27	15348.20	87.80
2012-13	13798.65	16100.83	85.70	18136.45	18539.99	97.82	17210.30	19288.43	89.23
2013-14	11021.62	13777.68	80.00	13207.39	13547.04	97.49	12954.31	15254.47	84.92
2014-15	10941.72	14211.01	76.99	14190.20	14592.49	97.24	14686.26	14949.71	98.24
Mean	-	-	85.13	-	-	97.91	-	-	88.85
S.D	-	-	4.11	-	-	0.63	-	-	3.99
C.V (%)	-	-	4.82	-	-	0.65	-	-	4.49

Source : Annual reports of the companies under study, Note : (i). MC represents Manufacturing Cost, (ii). S.D represents Standard deviation (iii). C.V represents Coefficient of variation

Table-5 Describes the percentage of manufacturing cost to total cost of co-operative sugar companies made during the period of study. Notably, the highest average percentage of manufacturing cost to total cost among the co-operative sugar companies was recorded by NSSK Ltd. and the lowest was by BSSK Ltd. In comparison of the average percentages among the co-operative sugar mills, BSSK was most productive to control and manage the manufacturing cost. The coefficient variation of BSSK Ltd. was 4.82%, NSSK Ltd. was 0.65% and MGSSK Ltd. was 4.49%. NSSK Ltd. was most consistent in controlling and managing the manufacturing cost as it has recorded a lowest coefficient of variation among the sugar mills understudy. The coefficient of variation of the company was lowest, but the average percentage of manufacturing cost to total cost was very high. The average percentage manufacturing cost to total cost of BSSK Ltd. was lowest among other sugar companies, but its standard deviation was high. Due to the higher deviations in the percentage of manufacturing cost to total cost BSSK Ltd. Failed to maintain the consistency.

9.2 Percentage Of Administration Cost To Total Cost

The administrative cost, on the other hand, is the aggregate of administrative labour cost, repairs, maintenance and depreciation on non-productive assets, interest on loans and borrowings and general expenses. The analysis of administration cost to total cost is most important because it is dominant portion of cost of production in sugar production. The percentage of administration cost to total cost is the ratio of administration cost to the total cost. The ratio shows the relative share of administration cost and its impact on total cost. Higher percentage denotes that administration cost is prominent component of total cost whereas the lower indicates that administration cost is not a major contributor to total cost. An increasing trend over a period of time signifies ineffective management of administration cost over total cost. Percentage of administration cost to total cost of the sugar companies under the study has disclosed in the following **Table 6**.

Table-6: Percentage Of Administration Cost To Total Cost

Year	BSSK			NSSK			MGSSK		
	Admn. Cost (Rs. in Lakhs)	Total cost (Rs. in Lakhs)	Percent age	Admn. Cost (Rs. in Lakhs)	Total cost (Rs. in Lakhs)	Percent age	Admn. Cost (Rs. in Lakhs)	Total cost (Rs. in Lakhs)	Percent age
2005-06	742.28	6306.79	11.77	91.75	7363.9	1.25	515.34	3654.55	14.10
2006-07	939.5	6474.93	14.51	108.13	8549.03	1.26	702.86	4852.53	14.48
2007-08	782.3	7671.25	10.20	125.47	7809.61	1.61	656.64	5824.69	11.27
2008-09	1084.06	6287.08	17.24	119.84	7302.14	1.64	812	5919.75	13.72

2009-10	1200.66	10891.04	11.02	306.88	12403.43	2.47	918.6	11743.04	7.82
2010-11	1188.19	9641.55	12.32	341.79	11026.12	3.10	1288.26	12532.95	10.28
2011-12	2156.06	15082.51	14.30	328.75	15449.91	2.13	1871.93	15348.2	12.20
2012-13	2302.18	16100.83	14.30	403.54	18539.99	2.18	2078.13	19288.43	10.77
2013-14	2756.06	13777.68	20.00	339.65	13547.04	2.51	2300.16	15254.47	15.08
2014-15	3269.29	14211.01	23.01	402.29	14592.49	2.76	263.45	14949.71	1.76
Mean	-	-	14.87	-	-	2.09	-	-	11.15
SD	-	-	4.11	-	-	0.63	-	-	3.99
CV (%)	-	-	27.61	-	-	30.36	-	-	35.76

Source : Annual reports of the companies under study, Note: (i).Admn. Cost represents Administration cost (ii). SD represents Standard deviation (ii).CV represents Coefficient of variation

Table. 6 Describes The percentage of administration cost to total cost of BSSK Ltd. was ranged between 10.20%-23.01%. It indicates that, the company was most successful during the year 2007-08, to control and manage the administration cost over total cost. The company has recorded 10.20% of administration cost to total cost, which was lowest throughout the period of study. The highest percentage was recorded in the year 2014-15, where it was 23.01%, which indicates that, the company failed to control and manage the administration cost against the total cost. The average percentage of administration cost to total cost of BSSK Ltd. was 14.87% with a standard deviation of 4.11% throughout the period of study.

Notably, the highest average percentage of administration cost to total cost among the co-operative sugar companies was recorded by BSSK Ltd. and the lowest was by NSSK Ltd. In comparison of the average percentages among the co-operative sugar mills, NSSK was most productive to control and manage the administration cost.

10.ANALYSIS OF VARIANCE AND TESTING OF HYPOTHESIS

The various cost components of co-operative sugar mills have witnessed fluctuations in their amount. In order to analyze the variances among the various cost components, One-way ANOVA was used and the following hypotheses were tested. The results of the same are presented in the Tables 5.1 and 5.2.

H_{01} : There is no significant difference between the Manufacturing Cost among the sugar companies understudy.

H_{02} : There is no significant difference between Total Cost among the sugar companies understudy.

H_{01} : There is no significant difference between the Manufacturing Cost among the sugar companies understudy.

Table-5.1 Results pertaining to ANOVA(Based on Table.5)

ANOVA						
Particulars		Sum of Squares	df	Mean Square	F	Sig.
Manufacturing cost (Amount in Lakhs)	Between Groups	29877856.09	2	14938928.04	.91	.415
	Within Groups	443577809.71		2716428807.77		
	Total	473455665.80	29			

Source: Annual reports

Table-5.1 Shows the ANOVA results pertaining to manufacturing cost. It shows that, manufacturing cost of sugar mills have not shown any significant differences. The calculated significance value of manufacturing cost was greater than 0.05 (i.e. 5% level of significance). Therefore, the null hypothesis has been accepted and it was concluded that, there is no significant difference between the manufacturing cost among the sugar mills.

H_{02} : There is no significant difference between Total Cost among the sugar companies understudy.

Table-5.2: Results pertaining to ANOVA(Based on Table.5)

ANOVA						
Particulars		Sum of Squares	df	Mean Square	F	Sig.
Total cost (Amount in Lakhs)	Between Groups	5446932.63	2	2723466.31	.14	.874
	Within Groups	542370535.32	27	20087797.60		
	Total	547817467.95	29			

Source: Annual reports

Table-5.2 Shows the ANOVA results pertaining to total cost. It shows that, total cost of sugar mills have not shown any significant differences. The calculated significance value of total cost was greater than 0.05 (i.e. 5% level of significance). Therefore, the null hypothesis has been accepted and it was concluded that, there is no significant difference between the total cost among the sugar mills.

11.FINDINGS OF THE STUDY.

The following are the important findings emerged from the study.

1. It was found that, the average manufacturing cost per quintal recorded by BSSK Ltd., NSSK Ltd. and MGSSK Ltd. were amounted to Rs. 2344.55, Rs. 2468.01 and Rs. 2401.37 respectively. The coefficient of variation recorded by BSSK Ltd., NSSK Ltd. and MGSSK Ltd. were 33.01%, 27.90% and 27.41% respectively. It indicates that, MGSSK Ltd. was most consistent in maintaining manufacturing cost per quintal throughout the study period.
2. It was found that, the average total cost per quintal recorded by BSSK Ltd., NSSK Ltd. and MGSSK Ltd. were amounted to Rs. 2771.03, Rs. 2523.02 and Rs. 2699.05 respectively. The coefficient of variation recorded by BSSK Ltd., NSSK Ltd. and MGSSK Ltd. were 34.11%, 28.14% and 27.06% respectively. It indicates that, MGSSK Ltd. was most consistent in maintaining its total cost per quintal throughout the study period.
3. It was found that, the calculated significance value of manufacturing cost was greater than 0.05 (i.e. 5% level of significance). Therefore, the null hypothesis has been accepted and it was concluded that, there is no significant difference between the manufacturing cost among the sugar mills.
4. It was noticed that, the calculated significance value of total cost was greater than 0.05 (i.e. 5% level of significance). Therefore, the null hypothesis has been accepted and it was concluded that, there is no significant difference between the total cost among the sugar mills.

12.SUGGESTIONS.

The following are the important suggestions of the study.

1. Due to the higher cost of production, the mills have failed to attain competitive edge in the international market. It is, therefore, suggested that the mills should target their cost to the internal as well as external market conditions by applying advanced cost management techniques like Life cycle costing, Target costing, Activity Based Costing and TQM.
2. Cost reduction is not at all possible if there is no cost culture and cost consciousness among the staff at all levels of organisation. Therefore, it is suggested that sugar mills should create a healthy cost culture in the organisation and develop cost consciousness among the staff by organizing symposiums, workshops and orientation courses on cost aspects.
3. At present the sugar cane average recovery rate is around 10 per cent. There is a scope for the increase in recovery rate. Therefore, in order to reduce the sugar-cane cost per quintal of sugar, it is suggested that

- the sugar mills should improve sugar-cane recovery rate by developing new rich sugar content cane seeds and inducing the farmers to go for cultivation of such cane offering incentives.
4. The co-operative sugar mills should improve their cost management practices by preparing more appropriate and analytical cost statements as per the standard norms set by the Institute of cost and works accountants of India. The mills should get their cost statements audited by qualified cost accountant.
 5. The government should make maintaining cost accounting records and cost audit compulsory for the sugar mills so that they can maintain cost records properly and manage cost in a most efficient manner.

13.CONCLUSION

The study is concluded with a note that, performance of co-operative sugar mills in Bidar is very poor when compared with other sugar industry. This is due to sugar mills do not have effective control over the cost incurred during the production and low recovery of sugar from the sugarcane crushed. In order to have a better control over the cost of new techniques like activity based costing, target costing, life cycle costing, TQM, bench marking, business process reengineering, etc. to be followed. Recovery of sugar can be improved by using modern machineries. Hence, it will improve the productivity and increase the profitability. Sugarcane prices should be fixed on basis of sugar recovery. Attention is to be given on manufacturing quality sugar as per international standards at competitive prices.

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