BUSINESS PERFORMANCE OF MALAPRABHA COOPERATIVE SUGAR FACTORY LTD., M. K. HUBLI

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATE

INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is one of the most important commercial crop of the tropical countries and is the main source of sugar in the world. It originated in New Guinea where it has been known since about 6000 BC. The earliest reference to it is in the Atharva Veda [1500-800 BC] where it is called ikshu and mentioned as an offering in sacrificial rites. The word 'sugar' is derived from the ancient Sanskrit word "sharkara."

Sugar cane cultivation, Sugar Industry and Sugar Trade play a very significant economic role both at national and international level. Sugar Industry is one of the major agro-based industries contributing for overall economic and social development of the rural mass wherever sugar factories are located.

Agro-based industries in India are highly responsible for creating significant impact on rural economy in particular and country's economy in general. Sugar industry ranks second amongst major agro-based industries in India. As per the Government of India's recent liberalized policy announced on 12th December, 1986 for licensing of additional capacity for sugar industries during Seventh Five-Year Plan, there would be only one sugar mill in a circular area of 40 sq km. Also, the new sugar mill is allowed with an installation capacity of 2500 TCD (Tonne Sugarcane Crushed per Day) as against the earlier capacity norms of 1250 TCD. Similarly, the existing sugar mills with sugarcane capacity of about 3500 TCD can crush sugarcane to the tune of 5000 TCD with a condition imposed that additional requirement of sugarcane be acquired through increased productivity and not by expansion of area for growing sugarcane.

Cane sugar is the name given to sucrose, a disaccharide produced from the sugarcane plant and from the sugar beet. The refined sugars from the two sources are practically indistinguishable and command the same price in competitive markets. However, since they come from different plants, the trace constituents are different and can be used to distinguish the two sugars. One effect of the difference is the odour in the package head space, from which experienced sugar workers can identify the source. In the production scheme for cane sugar, the cane cannot be stored for more than a few hours after it is cut from the cane field because microbiological action immediately begins to degrade the sucrose. This means that the sugar mills must be located in the cane fields. The raw sugar produced in the mills is item of international commerce. Able to be stored for 2-3 years, it is handled as raw material – shipped at the lowest rates directly in the holds of ships or in dump trucks or railroad cars and pushed around by bulldozers. Because, it is not intended to be eaten directly, it is not handled as food. The raw sugar is shipped to the sugar refineries, which are located in population centers. There, it is refined to a food product, packaged, and shipped a short distance to the market. In a few places, there is a refinery near or even within a raw-sugar mill. However, the sugar still goes through raw stage.

Important varieties

Some of the important varieties, widely accepted under organic management and inorganic management, suitable for different planting periods are as follows

Suru Sugarcane	-	Co-419, Co-740, Co- 7125, Co-7219, Co-86032 and Co-88121
		(15^{th} Dec- 15^{th} Feb)
Adasali Sugarcane	-	Co-419, Co-740, CoM-86032 and Co-88121
		(15^{th}July- 15^{th} Aug)
Pre-Seasonal	-	Co-740, Co-7219, Co-86032 and CoM-88121
		(15 Oct- 15 Nov)

Some other popular varieties also include Co-449, Co-671 and C0-1148.

Global Sugar Industry

Around 75 per cent of the global sugar production comes from the top 10 producers, of which the top three (Brazil, India and the European Union) contribute 40 per cent of the total. On August, (2012-13, sugar season) global sugar production stood at 174 million tonnes, increasing just 2 per cent over that of the previous year. Owing to high international prices and lingering impacts of global downturn, the world's global consumption (163.78 million tonnes) posted a negative growth rate of 0.12 per cent, compared to last 10 year's average of 2.64 per cent. The world sugar economy witnessed a statistical deficit for a second year in a row.

However, the first forecast of world sugar balance (October, 2010 to September, 2011) projected an optimistic world statistical surplus of 3.221 million tonnes, eliminating the global demand supply gap after a considerable period. With an expected total production of 170.37 million tonnes and consumption of 167.15 million tonnes, the global export availability was forecasted to exceed the import demand.

Indian Sugar Industry

In India, sugar industry is the second largest agro-based industry after textiles. The country is the second largest sugar producer in the world (accounting 13 per cent of the world's sugar production).The main sugarcane growing states in India are Uttar Pradesh, Maharashtra, Karnataka, Andhra Pradesh, Haryana, Bihar, Gujarat and Punjab. During 2011-12 sugar season, the sugarcane crop occupied over 50.37 lakh hectares in the country with a production of 361.36 million tonnes, of which 66 per cent is concentrated in the Northern part of the country. The sub-tropical region (Uttar Pradesh) contributes almost 60 per cent of India's total sugar production, while the balance comes from the tropical region, mainly from Maharashtra, Tamil Nadu, Karnataka and Madhya Pradesh.

Indian sugar production has reached 188 lakh tonnes by end of Feb'2013 which is a tad below last year's output by 0.31%. According to the Indian Sugar Mills Association estimates about 246 lakh tonnes were produced for the sugar season 2012-13. Indian sugar production is poised to increase to 298 lakh tonnes in the next year due to an expected increase in sugarcane production. With a surplus sugar production and strong export demand for 2012/13, India would continue to be a net exporter of sugar for the second consecutive year, with exports likely to reach as much as 2.5 million tonnes. Continued strong demand from bulk consumers will push sugar consumption to 265 lakh tonnes.

Production and Consumption of Sugar in India

After consecutive decline in production in 2007-08 and 2008-09, India's sugar production has started increasing. With the increase in the sugarcane output to 274 million tonnes in sugar season 2009-10, the production of sugar was expected to touch 18.75million tonnes by the time the sugar season came to an end in September, 2010. According to International Sugar Organization (ISO), a further 34 per cent production recovery was expected in the sugar year 2010-11, with a revised production of 25.5 million tonnes, and production recovery was expected in the sugar year 2011-12, with a revised production of 26.0 million tonnes. The production of sugarcane during 2012-13 is estimated at 334.54million tonnes. India's sugar is mostly produced from sugarcane and the swings in production are driven primarily by large swings in the acreage of land cultivated for sugarcane and rainfall patterns.

The sugar consumption, on the other hand, is estimated to have grown marginally to 23.5 million tonnes. The growth is on account of rising per capita income and government interventions to adjust stocks and facilitate trade to assure adequate monthly availability. Despite rising price, the sugar demand did not reduce among bulk consumers. Bakeries, soft drinks and local sweet manufacturers were accounted for around 60 per cent of the sugar demand. ISO estimated an approximate growth of 4 per cent in 2010-11 in India's sugar consumption, accounting for about 19.8 per cent of the global sugar consumption, and India's sugar consumption was also accounting for about 20 per cent of the global sugar consumption during 2011-12.

India ranks sixth in per capita sugar consumption. India's sugar consumption currently hovers around 20 kg/capita compared to 57.6 kg of Brazil. The lower per capita consumption leads to anticipation of increasing demand in the future, though in the last few years, the per capita consumption is increasing steadily at 3.7 per cent per annum.

Pricing Policy

Until the last Sugar Season (SS) 2011-12, there were two types of pricing that were followed by the Sugar Mills to remunerate the farmers – State Advised Price (SAP) and Statutory Minimum Price (SMP).The Commission on Agricultural Costs and Prices (CACP) decides the SMP, whereas, the State Governments fix the SAP, which is significantly higher than SMP.

The difference in pricing led to regional variation in productivity and profitability. To include reasonable margin for both the sugarcane and sugar producers, the Centre replaced the Statutory

Minimum Price (SMP) with Fair and Remunerative Price (FRP) in early 2010, for the minimum price to be paid to sugarcane farmers for the sugar season 2009-10. FRP for 2009-10 sugar season was fixed at ₹129.84 per quintal and had been further raised to ₹139.12 per quintal for the 2010-11 season. FRP for 2011-12 sugar season was fixed at ₹ 145.00 per quintal.

The number of sugar factories functioning during the year 2002-03 came down from 422 to 400 because of financial crises and delayed payment to sugarcane growers. As a result, the sugar production in the year 2008 reached its low of 144.32 lakh tonnes which was a rapid decrease by 33.60 percent over that in the immediate past year. The world sugar production during the year 2011 also declined in comparison to the same in the immediate preceding year. In the year 2011 the share of Indian sugar in the world total sugar production touched lowest level of 14.75 percent. There are 453 sugar mills in India comprises co-operative sector (252 mills) and private sector (134 mills) and public sector (67 mills).

The Sugar Cycle

The Indian Sugar Industry is cyclical in nature. The industry downtrend starts with improved mill profitability, prompt farmer payment resulting in higher sugarcane acreage and a bumper sugar output. This results in supply exceeding demand, leading to a decline in sugar prices which in turn leads to lower mill profitability, delayed payment to farmers, high sugarcane arrears, lower cane production, all culminating into higher sugar prices.

Karnataka Scenario

Karnataka Sugar Industry ranks third in terms of its contribution of sugar to total sugar production in the country and stands fourth in the country in the area under cultivation of sugarcane.

Karnataka State is one among the major sugarcane and sugar producing states in the country as considerable area is put under sugarcane cultivation for manufacture of jaggery, khandsari and white sugar. It is also a major provider of livelihood to millions of agricultural families and their dependents particularly in rural areas.

The Sugar Industry in Karnataka has around 41 sugar factories which are distributed all over the state. The various locations of the sugar factories of Karnataka Sugar Industry are Konnur, Varuna, Koppa, Madapura, Dandeli, Jambagi, Hosur, Margur, Yelgur, Siddapur, and Arsanghatta. The major benefits of Karnataka Sugar Industry are that it has generated many facilities in the state such as communication, employment, and transport. It has also benefited the state by helping in the development of the rural areas of the state by mobilizing the various resources of the villages.

The Sugar Industry in Karnataka contributes around ₹ 36 crores per year to the state exchequer in central excise duty. It also contributes more than ₹ 900 crores in the form of turnover tax and sales tax to the state exchequer. The state government in an attempt to boost Karnataka Sugar Industry has set up the Karnataka Sugar Institute (KSI) Belgaum, which has emerged as a center for education and training for sugar technology. The Karnataka Sugar Institute also provides important support to the Sugar Industry in Karnataka by doing R&D in the various aspects of sugarcane processing and production. Karnataka Sugar Industry has contributed a great deal to India's total level of sugar production and thus has helped the country to meet its demand for sugar.

Karnataka is one of the early entrants in the country to establish a sugar factory. Mysore Sugar Company Ltd., Mandya, is the first sugar factory established in 1933-34 in public sector followed by India Sugars and Refineries Ltd., Hospet, Bellary District by the private sector in 1934-35. The Kampli Cooperative Sugar Factory Ltd., Kampli in Bellary District (now privatized and called M/S. Sundari Sugars Ltd.) in the Co-operative sector was established in the year 1958-59. Over the past four decades, there is substantial rise in cane production in Karnataka. On account of this large number of sugar factories have come up numbering about 23 factories operating in private and public sector and 18 under cooperative sector. Many Sugar units in the State have also increased their installed crushing capacities. The annual crushing capacity is 250 lakh tonnes. In addition, by-products like Ethanol, Co-Generation of Power, Bio-compost making have become integral parts of sugar economy.

“A Sugarcane Control Board is to be established in the Southern State of Karnataka, following the recently approved Karnataka Sugarcane (Regulation of Purchase and Supply) Bill, 2013, which seeks to address the concerns of both cane farmers and sugar mills. It aims to set cane prices through a scientific method while ensuring timely and adequate payments accruing to the farmers, and will have legal power to prosecute the defaulting mills. This development could be a harbinger to more states adopting a more pragmatic sugarcane pricing regime in future".

The Sugar (Control) Order 1966 provides for power to the Government to regulate production of sugar, restrict sale of sugar by producers, movement of sugar and quality of sugar, call for information from producer or recognized dealer, inspection, entry, search, sampling and seizure of sugar and delegation of powers conferred by the Sugar (Control) Order, 1966 to any officer or authority of the Central or State Government. On the basis of the quarterly free sale quota decided by the Government, month-to-month release orders for sale of sugar in open market were issued under clause 5 of the Sugar (Control) Order, 1966.

In Karnataka, Belgaum (8.02 million tonnes), Bijapur (4.30 million tonnes), Mandya (1.38 million tonnes), Mysore (1.57 million tonnes) and Bidar (1.53 million tonnes) districts together contribute more than 75 percent of the total sugarcane area produced in the state. Belgaum, Bijapur, Mandya, Mysore and Bidar districts have net irrigated area under open well and bore well irrigation 1,01,969 ha, 1,31,078 ha, 10,652 ha, 40,437 ha and 27,194 ha, respectively.

Belgaum district is one of the major sugarcane and sugar producers in Karnataka State. The district has ten cooperative sugar factories. The Malaprabha Co-operative Sugar Factory Ltd was established in the year 1971 with the crushing capacity of 2500 tonnes per day.

The present study is an attempt to assess the performance of Malaprabha Co-operative Sugar Factory Ltd-M. K. Hubli. With an objective of identifying internal and external influencing factors that are important to the factory with a view to improving its performance and contributions to economic development of the region and improvement in the standard of living of farming families involved in sugarcane cultivation and the development of sugar industry as profitable agribusiness venture.

Specific objectives

Keeping the above facts in view, the present study was undertaken with the following objectives for evaluating the business performance of sugar factory.

1. To study the investment pattern of Malaprabha Co-operative Sugar Factory Ltd. M. K. Hubli
2. To study the procurement management and processing activities.
3. To study the physical and financial performance of the factory.
4. To study the marketing management of sugar and it's by products.
5. To study the problems faced by the sugar factory management.

Scope of the study

The current economic scenario is exhibiting for balance in almost all the sectors of the economy. The cooperative sector is also one of the important sectors especially in the sugar production. Belgaum district exhibits a major sugarcane growing area. Realizing the importance of sugarcane crop and also the cooperative sugar factories located in the area, Malaprabha Cooperative Sugar Factory Ltd M.K.Hubli is considered for the present case study. This sugar industry plays significant role in the rural economy. This is an attempt to analyze the performance of sugar factory in the district as a case study. This helps for management level to take appropriate steps towards growth of the sugar factory.

Presentation of the study

The study is presented in six chapters.

Chapter 1. It deals with the nature and importance of the study and the specific objectives of the study.

Chapter 2. It deals with review of literature closely connected with the objectives of present study.

Chapter 3. It describes the main features of the study area, the nature and sources from which relevant data have been collected and statistical tools and techniques employed for evaluating the objectives and interpreting the results. It also describes the terms and concepts used in the present study.

Chapter 4. The results of the study are presented.

Chapter 5. The results of the study are discussed in detail.

Chapter 6. A brief summary of the overall results and the main findings of the study are presented along with policy implications emerging from the findings.

REVIEW OF LITERATURE

A review of the existing literature relevant to the study helps the researcher to design the theoretical frame of the study and also to assess the nature and quantum of studies already undertaken in that particular area of research. In the light of the objectives of the study, the relevant literature reviewed and is presented under the following headings.

2.1 Investment pattern in processing units

2.2 Procurement management and processing activities

2.3 Physical and Financial performance of processing units

2.4 Marketing management of sugar and its by-products

2.5 Problems faced by the processing units

2.1 Investment pattern in processing units

Muralidharan (1981) compared the establishment costs of three processing units namely sugar, gur and khandsari units in Mandya district of Karnataka. He found that establishment cost of the three units to be in the order of ₹4, 40, 28, 322.03 lakhs for sugar units, ₹ 46, 329.83 lakhs for gur unit and₹. 9, 16, 722.38 lakhs for khandsari unit.

Dalvi *et al.* (1992) studied on economics of processing of cashew nut in Sindhudurg district of Maharashtra. They observed that the overall total capital investment was ₹ 40.44 lakhs, which consisted of ₹ 4.45 lakhs fixed capital (11.01%) and ₹ 35.99 lakhs working capital (88.99%). In the total capital investment, the share of land and building was 1.55 percent. Finally, they concluded that the processing of cashew nut was a capital intensive business.

Venkatasheshaiah (1992) evaluated the groundnut processing units in Andhra Pradesh. He had studied the investment pattern of groundnut processing units and revealed that there was a direct relationship between the total capital investment and the size of oil mill. It was seen that the capital invested per quintal of oil production was ₹161.01 in baby expeller mills, ₹ 122.24 in 2-chamber mills and ₹ 83.86 in 3-chamber expeller mills.

Ravishankar (1993) while studying the economics of production and processing of Davana in the Eastern Dry Zone of Karnataka observed that from among the various items included under variable costs, the cost of the raw material stood at ₹7.2 lakhs accounted for 92 per cent of the total variable costs. The wages, which accounted for 4.60 per cent followed by the cost of fuel wood, which accounted for 1.84 per cent.

Maurya *et al.* (1995) in their study on economics of production and processing of Anola in Varanasi district of Uttar Pradesh worked out the cost of Anola processing plant and its establishment. The total establishment cost (fixed cost) per quintal was₹ 8.00. It was the highest for depreciation being ₹ 3.40 followed by interest on fixed capital ₹ 2.50, insurance ₹ 1.00, maintenance cost ₹ 0.60 and electricity and water charges ₹ 0.50.

Rachhpal and Darshan (1996) conducted the study to examine the performance of co-operative sector infrastructure in Punjab market canneries. The study showed that the gross value of the fixed assets stood at ₹152.77 lakhs. The depreciation accumulated was ₹92.13 lakhs. The present value of fixed assets was computed at ₹ 60.64 lakhs.

Kalse *et al.* (1996) found that the initial investment for the establishment of oil industries, dhal mills and cotton ginning industries was ₹ 3.19 lakh, 4.25lakh and 5.63 lakh respectively. The cost of machinery was the major item contributing 61.43 and 59.12 per cent in dhal mill and cotton ginning industry respectively. The average capacity utilization of oil industry, dhal mill & cotton ginning industry was only 41.67, 71.20 and 47.79 per cent, respectively.

Ramandev (1998) in his study on management appraisal of cashew processing industry in Uttar Kannada and found that the total capital investment directly varied with the size of the unit. Further, he concluded that the total capital investment was ₹117.5 lakhs for large scale units and ₹36.32 lakhs for small scale units, with the majority of the fixed capital invested of about 80 per cent was in building and machinery, where in the marketing capital accounted for about 75 per cent of the total capital investment.

Chidri (1999) in his study on management of tur dal industry in Karnataka found that the total capital investment directly varied with the size of unit. He concluded that total capital investment was high in large processing units than in small processing units.

Kavitha (2000) had made documentation of agro-processing units/industries in different parts of Uttar Kannada district. Here, she stated about the number of agro-processing units/industries indifferent taluks of Uttar Kannada district with their investment had been documented.

Siddaram (2004) studied the investment pattern in the processing units. It clearly showed that plant, machinery and equipments formed major component of investment accounting for 50.12 per cent of investment followed by building and civil structures 33.35 per cent and cost of land 9.02 per cent and infrastructure facilities to the extent of 6.69 per cent. The investment on plant, machinery and equipments was₹ 150.36 lakhs followed by building and civil structures at₹ 100.05 lakhs followed by cost of land to the extent of₹ 27.05 lakhs. Investment on infrastructure facilities, office and fixtures and miscellaneous fixed assets contributed to an extent of 7.51 per cent, envisaging total investment of₹ 300.03 lakhs in the co-operative processing unit. Investment on infrastructure facility structures, office fixtures and miscellaneous fixed assets contributed to an extent of 7.49 per cent, envisaging total investment of ₹ 500.98 lakhs in private processing unit.

Shwetha (2010) reported that the total investment on modern rice mills was ten times higher (₹379.25 lakhs) as compared to conventional rice mills (₹36.97 lakhs). The net present value for modern unit and conventional unit was ₹ 408.35 and₹ 27.55, respectively. The capacity utilization was higher (68%) in modern units in comparison with conventional units (44%). The total returns obtained from both rice milling and poha making processes were higher in modern rice units (₹1478) as compared to conventional units (₹1381). This showed that the modern rice mills were more efficient than the conventional rice mills. Procurement costs were lower when paddy was purchased directly from farmers instead of purchasing through commission agents. Thus, mills would benefit from strong contractual arrangements with paddy growers.

Chadachal (2012) studied on production and marketing management of orchids in Uttar Karnataka District. She had studied the investment pattern and establishment of orchids. The total cost of establishment were found out to be ₹ 2,32,920 per gunta of which material cost constituted 94.97 percent and maintenance cost 5.33 percent. The construction of green house, well and planting material formed bulk of the material cost of the establishment cost.

2.2 Procurement management and processing activities

Bhargava Commission (1976) reported the following inadequancies of Sugar Factory. Short supply of cane to the factory, inadequate credit supply, delay in payment, lack of professional management, poor condition of plant and machinery, the practice adopted by the factories in marketing sugar during the period of partial decontrol. The commission further stated that these inadequancies directly or indirectly lead to sickness of sugar factories.

Iyer (1985) had stated that the cost of sugarcane constituted about 70 per cent of the fair price of sugar and included the basic price of sugarcane, purchase tax and other local tax, cane cess and co-operative society's commission. Conversion cost which included wages and salaries, stores and fuel, over heads and depreciation less credit for molasses constituted about 22 per cent of total fair price. The balance 8 per cent represented return on equity, interest on borrowing and bonus to employees. He reported that only about 37 per cent of sugarcane used for manufacturing of sugar, the balance 51 per cent was used for the manufacture of gur and khandsari and 12 per cent used for seeds and chewing purpose.

Chiranjivi (1985) stated that the decrease in sugar per cent was due to above mentioned reasons. If the sugar per cent in cane was higher, the recovery would be high. The average fibre per cent was 18.04 per cent over the study period. The recovery per cent of fibre was ranging from 18.65 to 19.50 over the study period. The reason for increased fibre content was because of poor sugarcane quality.

Rayudu and Pattabhi (1989) stated that the analysis of capacity utilization was an important yard-stick to measure the performance of cooperative industries.

Azad *et al.* (1990) studied the cost structure of crystal sugar in sugar factories of Meerut district under public, co-operative and private sectors. The variable cost per quintal of crystal sugar was observed to be significantly very low (₹380.23) in the private sugar factories as compared to the respective figure in public and co-operative sector (₹425.48 and ₹422.70). The higher variable cost per quintal of sugar in the sugar factories of public and co-operative sector was mainly due to poor and in-efficient management, old plant and lesser efficiency on the maintenance of plants and equipments in comparison to the private sector. On the contrary, total fixed cost in sugar factories owned by private management was observed to be significantly higher (₹49.25/quintal) as compared to the sugar factories controlled by the Government (₹44.34/quintal). The higher fixed cost per quintal in the sugar factories of private management as compared to public management was due to comparatively higher plant value and higher strength of permanent labour and technical staff in the former case as compared to the latter. Total processing cost per quintal of sugar was found to be significantly lower in the sugar factories of private management (₹506.67/quintal) as compared to the sugar factories owned by the Government and Co-operatives (₹554.93 and ₹ 553.97/quintal).

Nageswara Rao and Doss (1990) came out with a recommendation of proper varietal management in factory zones. The proportion of varieties should be 40 percent early. 30 percent mid season and 30 percent late type. They opined that a combination of low fibre high sugar and high purity did not quality for attaining desired quantity. What was required was a variety that had potential to accumulate early in life, high sugar content and could progressively increase the same. It must maintain this level of sucrose for period so as to extend scope for its utilization for long periods of crushing.

Natarajan (1990) observed that the major cost in milk production was cattle feed (20%). He suggested that Agricultural Price Commission in consultation with Economic Ministries and Planning Commission to recommend, from time to time to the procurement and support prices of milk and milk products as done for other agricultural commodities. In addition, he reported that for better performance of Dairy Co-operative Societies (DCS), four factors were important viz., high milk utilization, better milk marketing, distribution of cattle feed and credit for buying and technical assistance to milk producers through co-operatives.

Kaliya Murthy (1990)), stated that an increase of 0.1 per cent trash in cane increased fibre per cent by about 0.5 per cent, increased sugar loss in bagasse by 0.05 per cent and decreased sugar extraction and over all sugar recovery by about 0.3 to 0.4 per cent. Hence, to avoid or minimize these losses, the managements had to procure the clean cane without extraneous matter coming along with cane. The harvesting of immature cane should be avoided as otherwise; it would cause staling of cane.

Khot (1992) studied the sugar recovery trends at 10 day interval in Ugar Sugar Works Ltd and Dudhaganga Krishna Sahakari Sakkare Kharkane Niyamit. From the data, it was observed, Dudhaganga Sahakari Sakkare Kharkane Niyamit.had only 9.30 per cent sugar recovery where as Ugar Sugar Works had 11.70 per cent sugar recovery in the beginning of crushing season. The highest recovery of Dudhaganga Sahakari Sakkare Kharkane Niyamit was 12.81 per cent whereas Ugar Sugar Works had 13.73 per cent in the month of February. At late crushing period (April- May) both factories almost had parallel sugar recovery curve. While comparing the recovery trend of these two factories, it could be concluded that early maturing varieties CO-671 and mid-late varieties CO-7219, CO-8014 and CO-8011 had influenced the overall recovery of the cane. Hence, there was a need to plan a planting and harvesting schedule for different varieties systematically to get better recovery in each factory zone.

Vinayak Rao (1992) examined the economics of rice milling in Shimoga district of Karnataka. The efficiency in milling was analyzed by examining the recovery per cent (out turn) of rice and by- products. The out turn of head rice was much higher in modern mills (69.90 %) when compared to conventional mills (64 %). The recovery of broken and bran was 3.00 and 4.21 per cent for modern rice mills whereas, it was 3.42 and 4.26 per cent for conventional mills, respectively. On the whole, the average recovery was 77.17 per cent in modern mills as against 73.95 per cent in conventional mills.

Hapase and Welw (1993) reported that sugarcane byproducts viz. sugarcane trash and presumed cake (2:1) was efficiently utilized for the better production of better quality of vermicompost by use of earthworms and bio-fertilizer having good C: N ratio (16.4:1) within the period of two months. Application of vermicompost (5 mt/ha) increased the sugar yield by 12.66 mt/ha and sugar recovery by 0.95 unit over control.

Mani (1993) studied Kerala Milk Marketing Federation by purposefully selecting Ernakulum Milk Union. He developed the procurement model namely Ideal Cost Method to calculate the route-wise efficiency. The author selected the three procurement routes out of ten; of which one was most efficient (R1) second moderately efficient (R2) third least efficient (R3) based on procurement cost per kg of milk.

Hapase and Welw (1993) suggested that maturity wise harvesting of sugarcane helped for better quality crushing, it generally gave more recovery by 1 to 1.25 percent in first months. The average recovery of the season could be increased at least by 0.5 percent. They also listed the following factors which influenced recovery of sugar from sugarcane were date of planting, variety-early, mid and late, soils, farm management, plot size, yield per unit, time gap from harvesting to crushing and climatic conditions. Among all these points, date of planting was one of the major criteria for recovery.

Bhagat (1993) had analyzed the causes of sugar losses in the factory and also made suggestions to reduce sugar losses by controlling some fundamental operating conditions like rate of crush, steam pressure and vacuum condition.

Varma and Singhal (1994) suggested that the harvesting and transportation should be managed by mills to get fresh cane, the interval of 15-24 hour or even lesser might be maintained between harvesting and crushing. By this procedure, there would be increase in sugar recovery of about one percent extra.

Kotasthane *et al.* (1994) had attempted to offer practical ways and means to manufacture quality sugar and some suggestion for the procurement of quality sugarcane given were fresh sugarcane, cleaned sugarcane, harvesting based on maturity wise Brix Survey, removal of tops and top side internodes and avoidance of burnt cane.

Dhamankar *et al.* (1995) analyzed protein content of filter cake from fifty eight various sugar factories from Maharashtra. The average protein content of filter cake was found to be about 7.45 per cent. The use of filter cake was found to be about 7.45 per cent. The use of filter cake as a cheapest source of protein was being discussed.

Khothari (1995) reported that both natural and manmade causes are responsible for expansion and contraction of sugarcane area, the natural causes related primarily to factors such as weather, pests, weeds, insects and disease, the manmade factors related to price of sugarcane vis-à-vis that of sugar and Government policy regarding price and distribution of sugar and licensing of sugar factories etc.

Balasubramanian and Prema (1996) in their study on processing and trading of cashew nuts in India observed that the total processing and raw material costs accounted for about 70 per cent, labour charges 10.5 per cent, purchase taxes 5 per cent, freight and handling charges 5 per cent, packing cost 4.5 per cent and remaining 5 per cent was contributed by costs of power, fuel, depreciation and overheads all put together.

Davasgaium and Boodoo (1997) revealed bagasse was investigated as a potential source of litter materials due to its availability at a low cost; it was compared to wood shavings and sawdust. Assessment of the materials was based on live-weight gain, feed efficiency, carcass quality and litter condition. It was concluded that bagasse was potentially as useful as the other materials and would be cheaper than either.

Balappa (1997) in his study production, marketing and processing of red gram in Gulbarga district revealed that the purchase price of red gram by the dal miller was ₹1881.27 per quintal and the sale price was ₹ 2277.04 per quintal of which the cess incurred for purchasing red gram was ₹ 81.27 per quintal.

Shobha (1998) in her study on performance of fruit and vegetable processing units in co-operative and private sector in Uttar Kannada district found that the private sector processing unit procured fruits and vegetables to the tune of 187.098 metric tonnes values at ₹ 8.37 lakhs. The procurement of fruits and vegetables by the co-operative sector unit was 161 metric tonnes valued at ₹ 6.22 lakhs. Fresh fruits and vegetables constituted 87.58 percent of quantity while semi-processed fruits and vegetables accounted for 12.42 per cent of the total raw material purchased.

Veena and Tajinder (2000) had studied performance analysis of Bhagpur and Jargoan Sugar Mills of Ludhiana district in Punjab. They found that production cost of sugar in Bhagpur Sugar Mill was ₹12.37 per kg and it was₹ 9.89 per kg in Jargaon Sugar Mill. The expense on raw material was the major item of the total cost.

Savita (2000) conducted a study on management appraisal of spinning mills in Gadag district (Karnataka) found that the total cost incurred per quintal of cotton processed in the cooperative sector unit was more (₹1531.22). Further, she found that co- operative sector unit incurred a loss of ₹

225.08 on every quintal of cotton processed, while the private sector unit earned a profit of₹ 29.59 on every quintal of cotton processed.

Ashraf Ali (2000) in his study on business performance of co-operative oil mills observed that the interest on capital locked in carrying the inventory, store maintenance and storage costs and material losses were the major components in the overall cost of the inventory management for both large and medium scale units.

Gajanana and Subramanyam (2001) studied the marketing and exports of lemongrass oil in Kerala. The process involved filtration to remove sediments, moisture and blending for standardizing citral content. The processor observed shortage/loss of around one per cent during filtration of oil. The cost of processing of lemon grass oil was observed to be ₹ 4.70 per kg. The purified/standardized lemongrass oil was traded locally as well as in the international market.

Manjunath (2004) evaluated the performance of fruits and vegetable processing units of Bangalore district which revealed that the total cost of processing amounted to₹ 31147.38 and ₹ 33890.37 per tonne of processed products in private and public sector units, respectively.

Meena *et al.* (2006) examined the economic viability of different sizes of chilli processing units in Rajasthan. The results showed that the cost of processing per quintal of chilli was ₹180.06, ₹167.30, and ₹234.42 for small, medium and large processing units, respectively. Margin of processors increased with an increase in the size of processing unit. However, the difference in the size of processing units had no influence on the recovery of chilli powder. Value addition for investment of a rupee as processing cost and returns per rupee of investment also increased with an increase in size of processing unit. All the processing units were operating above the break-even quantity, but failed to utilize their installed capacity.

Deorukhakar *et al.* (2007) studied in Sindhudurg district of Maharashtra, India, worked out costs and returns structure and employment potential in kokum (*Garcinia indica*) processing units. The study revealed that processing of kokum into kokum syrup was more profitable than kokum agal and kokum rind. The processing of kokum into kokum syrup resulted in gross returns of ₹ 3780 per quintal at a cost of ₹ 2440/-, thereby yielding net returns of ₹ 1339.63 per quintal. On the other hand, kokum rind and kokum agal yielded net returns of ₹604.91 and ₹476.33 per quintal.

Jayakumari (2008), in this Dairy Co- operative - Crafting India's Economic Development, she pointed out the achievement of the dairy co-operatives in India. The dairy development activities had the twin objectives of encouraging milk production for gainful employment, improvement of socio economic conditions of the rural people by procuring milk at a remunerative price and simultaneously supplying good quality milk and milk products at reasonable price to consumers. The hygienic quality of raw milk needs to be improved to ensure milk products of higher standards. Payment for milk in India was generally based on its FAT and SNF content. Payments for milk on the basis of microbial loads need to be initiated to enhance quality of milk and make India's milk globally acceptable.

Sharma and Pandey (2008) studied the costs and net profits from guava processing in Uttar Pradesh. The cost of processing guava into jam and jellies was estimated at ₹3, 96, 482 per year, the gross returns obtained from selling it was worked out to ₹ 5,28,750 per year and the net returns obtained were ₹ 1,32,268 per annum. It was observed that the processing of guava was more profitable than selling it raw.

Nithin (2008) studied the procurement management in different types of dairy processing units. The quantity and cost of the milk procurement indicated that cooperative unit procured the highest quantity followed by private large scale and private small scale units. In case of cost involved in procurement of milk, the transportation and handling cost accounted for maximum for all the units.

Godihalkar N. (2012) studied the procurement strategy in sugar factory. The average sugarcane procurement target was 5,02,052 metric tonnes and achievement was only an average of 4,43,325 metric tonnes i.e., 88.30 per cent of the total procurement target. The target achieved was ranging from 72.75 to 92.32 per cent of the total procurement targets over the study period. The factory could not achieve the targets set for the years due to of non-availability of sugarcane because of competition from other private and co-operative sugar factories and Gur manufacturing units which procured the sugarcane by paying higher prices. The other reasons attributed for low target achievement was due to the technical problems associated with the machinery.

2.3 Physical and Financial Performance of the Processing Units

Flink and Grunewald (1969) observed that ratio above unity indicated a firm's ability to meet current obligations. This ratio was found to be greater than unity in all the years over the study period. Thus, it could be concluded that the sugar factory had maintained a reasonably good level of liquidity position.

Page *et al.* (1970) indicated that higher ratio was associated with problem of liquidation, because, the claims of the owners had to be met by sale of fixed assets, which were in non – liquid form.

Sridharan (1975) observed the rise in the value of this ratio as a clear indication of the manifold expansion of the services provided by the institution.

Walker (1976) opined the higher value of efficiency of capital ratio indicated judicious use of capital.

Ananth (1984) evaluated the Performance of the Grape Growers Marketing and Processing Co-operative Society, Ltd. Bangalore from 1958-59 to 1980-81 by computing the ratios such as solvency ratios, liquidity ratios, profitability ratios and turnover ratios. The study revealed that the management efficiency of the society had improved over the years; a large ratio of fixed assets to owned funds (9.03) during consolidation phase was a desirable improvement. The study indicated that the society showed an impressive record of performance during 1979-80 and 80-81 with regard to net profits to fixed assets (ratio of 20 and 18 per cent).

Rayadu (1985) studied the working of industrial co-operatives from 1977-78 to 1981- 82 using various financial ratios. It was found that all the industrial co-operatives had more solvency than liability but was less than the established standard of 2:1 .It was also revealed that they were not in a position to me*et al*l current obligations immediately, since the aggregated acid test ratio worked out 0.46:1.

Subbarao (1985) analyzed the growth rate of certain variables like share capital, membership, total assets in his study on business performance of the Central Areca nut Marketing and Processing Cooperative Ltd, Mangalore, Karnataka from 1973-74 to 1980-81. He observed that annual rate of increase of different performance variables were not uniform. The growth of paid-up share capital, membership, total assets, working capital and purchases increased steadily, while in case of sales, the growth rate was high in the initial years and declined in later years.

Shankara Murthy (1986) studied the performance of Karnataka State Cooperative Marketing Federation Limited. He employed financial ratio analysis to evaluate the financial performance of the federation. He used different ratios to study the different aspects of financial position of the federation such as solvency, liquidity, turnover, profitability, efficiency and strength. He said that the ratio analysis would provide better idea of the financial position of the federation.

Mishra (1990) studied the working capital management in Orissa State Cooperative Milk Producers Federation (OMFED) Limited. He had used various concepts like gross working capital, net working capital in the analysis.

Mattigatti (1990) studied the performance of milk producer's cooperative societies and their impact on dairy farming in Dharwad district. The author selected a number of physical and financial indicators to evaluate the performance. The secondary data required was collected from the various annual reports of milk producers cooperative societies for the period 1986-88. He opined that both the physical and financial indicators of the societies showed significant growth in their values. The above average societies had already progressed with higher values for the indicators compared to below average societies, while below average societies well shown a greater rate of growth, hence, he concluded that over the period of time all these societies would contribute to the overall development of the societies.

Jithendra Kumar (1990) studied the performance of dairy cooperatives and their impact on milk production, income and employment in Chitoor district of Andhra Pradesh. The study revealed that the societies which were above the average level has shown better performance with an increase in membership and milk procurement, and profits of societies showed and increasing rate except the society-II

Padmini *and* Lekha.(1992) studied financial performance of Shree Narayana Power Loom Industrial Co-operative Society Ltd by employing various financial ratios such as turnover ratio, liquidity ratio, sales ratio, etc. The analysis revealed that the liquidity position of the society was very poor, thus financial performance of the society was not up to the level.

Reddy (1994) studied the Financial Performance of Mlkarnoor Cooperative Rural Bank with the help of different financial ratios and revealed that the institution had very acceptable and appreciable value for quick ratio (1.74).

Dash (1996) analysed the financial performance of the District Co-operative Banks of Maharashtra through Composite Index. To study the financial performance owned funds to working capital, deposits to working capital, borrowing to working capital, credit deposit ratio, yield on assets, cost of funds, cost of management, net margin and recovery percentage etc. He concluded that DCCS banks need great attention from NABARD, apart from supervision and monitoring.

Thippesha (1997) A standard ratio of 1:1 was desirable for production units like sugar factories This indicated that the sugar factory had maintained adequate cash balances to meet the day – to – day requirements. However, they still depended on their inventory for meeting immediate commitments.

Ashraf Ali (2000) used financial ratios as the main tools for analyzing and appraising the Business Performance of Co-operative Oil Mills in Gadag District of Karnataka and found that at on overall levels, the condition of large scale unit was very unsatisfactory while that of the medium scale unit was just satisfactory.

Soundara *.P.* (2001) analysed the Performance of Coir Co-operatives in Tamil Nadu. Secondary data were collected from the Directorate of Industries and Commerce Chennai for 2000-01. The study covered a period of 10 years from1991-92 to 2000-01 the study, he concluded that the various facts and findings relating to the working of the coir co-operatives in TamilNadu clearly indicated that the position of the units was not satisfactory.

Rao and Madhu (2001) studied the Financial Performance of Dairy Co-operative (URMUL) in Rajasthan. The study revealed that milk products had an annual growth rate of 11.22 per cent in milk prices, the total amount paid to products per year increased form₹ 8.40 crores to₹ 34.39 crores over the period depicting a compound growth rate of 14.84 per cent per year. Milk products sale increased at the rate of 69.33 per cent.

Konieczka (2002) reported the Profitability, Liquidity, the level of Debt and Efficiency data for a number of small (assets up to 20 million zloty), medium (20-40 mil. zloty) and large (over 40.0 mil. zloty) Polish Sugar Companies were analyzed for the period 1996-2000 in order to establish potential advantages of industry restructuring. The results revealed generally weakening financial indicators for the period; funding and cash flow problems were most obvious in the smallest companies, suggesting that restructuring in favour of large sugar concerns with stronger market representation and lower unit costs would bring economic advantages.

Smitha *et al.* (2003) evaluated the business performance of fishery cooperative societies in Vasai taluk of Thane district, Maharastra.The study was conducted among eight fishery cooperatives of 11 existing primary cooperative societies in Vasai taluk. A financial ratio technique was used to study financial performance of fishery cooperatives. Vasai zone with a production of 32,643 tons had contributed to the tune of about 32 percent of the total marine fish landing of thane district in 1995-96, which has come down to about 9,943 tons by the year 2002-03.This decline was due to over exploitation of fish and loss of fish stock due to increasing population level in the area.

Navaneetha (2009) studied Financial Status of Co-operative Sugar Mill through Z-Score Analysis. The decreasing Z- score indicated that the sugar mill was not in a sound financial condition.

Lakshimipathi and Suryanarayan (2010) while discussing the performance of sugar industry in India indicated that in order to boost the sugar industry in India, the Central and State Governments had to relax the controls on sugar industry and ought to fix remunerative cane prices to encourage the sugar cane cultivation. Further, they recommended that Government must make allowance to blend 10 per cent of ethanol in petrol and lift the restrictions on movement of molasses. These steps made mills more viable and they in turn could pay fair/ remunerative price to cane farmers.

Ravi (2011) carried out a study to analyze financial efficiency, profitability and contribution of by-products in the profitability of the factory. Descriptive statistics and growth rates were computed for various performance indicators. The growth in physical performance indicators like duration of crushing season (4.84%) and average sugar recovery (-1.28%) which was not significant during 2009-

10 period. The compound growth rate of financial indicators viz., share capital (6.92%), reserve funds (11.53%), owned funds (10.93%) and current assets (15.86%) were significant except current liabilities. The current ratio was greater than unity in all the years.

Srikrishna (2013) studied the performance of Tur Board in Gulbarga District. He employed financial ratio analysis to evaluate the financial performance of the Tur Board. He used different ratios to study the different aspects of financial position of the Tur Board such as liquidity, leverage, activity and profitability ratio. He said that the ratio analysis would provide better idea of the financial position of the federation.

2.4 Marketing Management of Sugar and its By-products

Manmohan Singh (1986) discussed the importance of marketing and stated marketing should be customer oriented. He defined marketing management as branch of management and concerned with activities towards attainment of marketing goals. Marketing management should look for market opportunities and design appropriate strategies for tapping the opportunities profitably. It should be a creative management function and he described the objectives of marketing should be to increase in sales volume, increase in profit and growth of enterprise. He also mentioned the functions of marketing manager or executive as analyzing market, determining market goals, organizing marketing activities, assembling, managing product and controlling activities.

Raju and Ramesh (1989) identified two jaggery marketing channels namely.

Channel I: Farmer- Commission Agent – Wholesaler – Retailer- Consumer.

Channel II: Farmer – Village Merchant – Wholesaler - Retailer- Consumer

The net share of the producer in the consumer rupee was 87 percent in channel-I.

Boothalingam (1990) studied diversification and increased efficiency in Rajarambopur Patil Sahakari Sakhar Karkhan Ltd. The factory diversified its activities with the aim of

1. Using the by-product like molasses and bagasse
2. Giving more price to sugarcane growers
3. Converting the sugar factory into a chemical complex using the by-product

After establishment of distillery unit, acetone unit and Indian made Foreign Liquor Unit were started paying ₹ 60 to 75 more than price fixed by the Government.

Maurya *et al*. (1995) indicated that in marketing of anola products, highest percentage of consumer's rupee (62.25%) was the processing cost followed by the cost of Kutch anola (15.58%), retailers margin (10.87%), manufacturers margin (8.67%) and charges paid by retailer 2.63 per cent.

Dhamankar *et al*. (1996) analyzed protein contents of filter cake from fifty eight various sugar factories from Maharashtra. The average protein content of filter cake was found to be about 7.45 percent. The use of filter cake was found to be about 7.45 percent. The use of filter cake as a cheapest source of protein was being discussed.

Ramandev (1998) in his study on processing of cashew nut in Uttar Kannada district of Karnataka identified the following five main channels for marketing cashew kernels.

Channel-I Processor – Consumer

Channel-II Processor – Trader – Consumer

Channel-III Processor – Commission agent – Consumer

Channel-IV Processor – Exporter – Consumer

Channel-V Processor-cum-Exporter – Consumer

Further, it could be observed that highest quantity of cashew kernels were marketed through Channel-III (36.06%) and least was through Channel-IV (3.5%) sales. Further, it could be noticed that sales tax and turnover tax, transportation and handling costs, commission charges and export expenses were the major components of marketing cost. Total marketing costs amounted to ₹ 89.41 per tin. The highest cost of marketing was noticed in case of Channel-III (₹ 155.19/tin) and the least was observed in case of Channel-V (₹ 70.33/tin).

Shobha (1998) studied the performance evaluation of co-operative and private fruit and vegetable processing units at North Karnataka, she revealed that the marketing of processed products of two processing units, followed the alternate channels as under;

Channel-I Processor – Wholesaler – Retailers – Consumers

Channel-II Processor – Retailer – Consumer

Channel-III Processor – Consumer

Channel-IV Processor – Wholesaler – Caterer

Channel-V Processor – Caterer

The private sector unit was marketing the produce through the two channels (IV and V) by selling their produce to wholesaler on an average at ₹3171.002 (64%) per quintal and at a price of ₹ 3360.63 per quintal (36%).

Asharaf Ali (2000) in their study on Business Performance of Co-operative Oil Mills a Management Appraisal in Gadag district of Karnataka State reported that, the channels used by the oil mills for marketing of various main products and by products were common and were identified as follows:

Channel-I _ Processor----- Dealer------Consumer

Channel-II _ Processor-----Wholesaler----- Retailer----- Consumer

Channel-III _ Processor-----Commission Agent-----Trading Agent---Consumer

Channel-IV _ Processor----- Retailer----- Consumer

Further, he revealed that, for marketing of de-oiled and unde-oiled cakes, the large-scale unit used duly first three (I, II, and III) channels, while the medium scale unit used only the first two (I and II) channels. The large-scale unit marketed a maximum quantity that was 66.63 percent and minimum quantity that was 2.31 percent of total quantity marketed through channel-I and channel-IV respectively. While the medium scale unit marketed a maximum quantity of 77.95 percent and a minimum quantity of 4.81 percent of the total quantity marketed through channel-III and channel-IV.

Gajanana and Subrahmanyam (2001) studied the marketing and exports of lemon grass oil from Kerala. Lemon grass oil was observed to be marketed mainly through two channels as below.

Channel-I _ Producer – Co-operative society – Processor/Exporter

Channel-II _ Producer – Private traders – Processor/Exporter

Between the two channels, nearly 78 per cent of growers (including 22% selling to cooperative society also) sold 59 per cent of the oil to the private traders and 44 per cent of the growers, sold 41 per cent of the oil to the co-operative society in Kavikadava village of Kerala state.

Reddy *et al.* (2004) focused on marketing channels, price spread, marketing cost, marketing margins and producers share in consumer's rupee in cattle markets. For this purpose 25 buyers and 25 sellers from each of the two markets were selected randomly. They concluded that total margin of intermediaries were high where there was more number of intermediaries in marketing channel. Low total margins (nearly half) were observed in channel-I compared to channel –II, which was having more number of intermediaries in all cases. It was found that channel- II had less marketing efficiency than channel-I. The study also identified that transportation charges followed by commission agents charges and market fee respectively had their major share in marketing costs.

Chinappa Reddy (2007) in his study conducted in six districts of Karnataka state observed that a majority of vermicompost producers used it only on their farms and just 16 per cent of them sold the compost to other farmers.

Sowmya Shankar *et al.* (2008) conducted a study on marketing of grapes in Karnataka: A case study of Bangalore and Bijapur district found the different channels through which grape flew from the point of production to the point of consumption were identified and then were categorized in the following channels.

Channel I: Farmers – Pre - Harvest Contractor – Wholesaler – Retailer – Consumer

Channel II: Farmers – Commission Agent – Wholesaler – Retailer – Consumer

Channel III: Farmers – HOPCOMS – Consumer

Channel IV: Farmers – Consumer

Singh and Singh (2009) studied on costs, margin and price spread of rapeseed and mustard in Sriganganagar district of Rajasthan. There were four channels identified *viz*.,

Channel-I: Producer - Commission Agent – Processors – Oil wholesaler – Retailer – Consumer

Channel-II: Producer – Wholesaler cum Commission Agent - Processors – Oil wholesaler I- Wholesaler II- Retailer – Consumer

Channel-III: Producer - Commission Agent –Wholesaler – Processor – Oil wholesaler I- Wholesaler II- Retailer – Consumer

Srikanth (2011) conducted a study on marketing channels of mango: a study in Srinivasapura taluk of Kolar district found the different channels through which mango flew from the point of production to the point of consumption were identified and there were categorized in the following channels.

Channel-I Producer – Wholesaler – Retailer – Consumer

Channel-II Producer – Retailer – Consumer

Channel-II Producer – Consumer

Chadachal (2012) conducted a study on marketing cost of orchids: a study in Uttar Karnataka District. Total marketing cost incurred by Growers Association per box was ₹ 160 of which transportation cost (37.50%) contributed more to the total cost of marketing because Growers Association would make arrangements to transport orchids to the distant market situated in Panji, Madgoa and Vasco of Goa State. Labour charges, packing and loading were the other marketing cost incurred by the Growers Association to the extent of ₹50 ₹ 30 and ₹ 20 respectively for each box transported. Next major cost was labour cost (31.25%). Other cost contributed comparatively less to the total marketing cost like loading (12.50%), and packing charges (18.75%).

2.5 Problems faced by the factory management

Nagesh (1990) found that major problems faced by the cashew nut processors in Karnataka were high competition among the existing processors, short supply of raw materials, frequent price fluctuations, non-availability of skilled labour and high taxes.

Venkatasheshaiah (1992) in his study on groundnut processing units in Andhra Pradesh, had identified that stiff competition among the processors for getting the required raw materials, frequent power shedding, high taxation, low product recovery and non-adoption of efficient technology, at an affordable costs as the major problems associated with the groundnut processing.

Mangal Singh (1995) while studying the strategies for effective management of sugar factories in India found that lack of quality raw materials, efficient technology and professionally trained management personnel at different levels of organizational structure as the main problems as depicted by the study. He carried these problems as firms' internal problems and similarly pointed to the firms external problems such as governments pricing policies etc.

Rachhpal and Darshan (1996) in their study performance of agro-processing units in Punjab revealed that failure of these industries on the market front in terms of brand was the major problem. Further, he opined that any such failure ultimately put a question mark on the very survival of the industry or unit under consideration.

Brahmaprakash and Dinesh (1997) in their study on infrastructural requirements for establishment of development and operation of agro-processed industries in rural areas opined that lack of market information systems, timely and adequate financial support and post-harvest technology as the major problems to realize the rural projects in India.

Roy (1997) opined that lower capacity utilization of the agro-based industries was reasoned by lack of infrastructural facilities such as lack of transportation, storage and technology for post-harvest handling. He also opined that the lack of integrated network between the producer-farmer and the processor as indirect problem of agro-based industries.

Ramandev (1998) in his study on business performance analysis and appraisal of the cashew nut processing units in Uttar Kannada district of Karnataka had identified that high taxation, short supply of raw materials, unfavourable government policies and marketing system were major problems as conceived by the industry.

Shobha (1998) studied on performance evaluation of private and co-operative processing units of fruit and vegetable processing units at North Karnataka. The prevalence of problems in the co-operative sector processing units were inadequate availability of raw materials in terms of quality and quantity, lack of power supply and also problem in lack of modernization of machinery. Inadequate transport facility and high freight charges, in private sector short supply of power and high taxation were major problems constituted in private sector.

Chidri (1999) in his study on management of agro processing industry in Karnataka pointed that, the major constraints in tur processing units were high taxes, high procurement cost, irregular and inadequate power supply, inadequate finance, irregular labour supply, inadequate marketing facilities and repairs and maintenance.

Manjunatha (2000) in his study on Management of food processing units – A Case Study of Roller Flour Mills in Bijapur District (Karnataka), he concluded that most important problems in Roller Flour Mills were problems of marketing, problems regarding processing, problems regarding government policies and procurement problems.

Veerkar *et al.* (2001) studied constraints in *kokum* processing industry. They found that the common problems faced by the industry was higher transport charges incurred in marketing which was 60 per cent of the processing units, similarly high price of raw materials and its non-availability were reported by the same (60%) processing units. On the other hand, 70 per cent and 80 per cent of the processing units faced the problem of non-availability of labour and capital respectively. Similar problems were also reported by the Amrit *kokum* and *kokum* butter processing units. To overcome their problems, more than 70 per cent *kokum* processors proposed to provide long term financial assistance with concessional rate of interest by the financial institutions. Further, they suggested increasing the area under *kokum* to stabilize the supply level and to give relaxation on the taxes to be paid by the processors towards the processed *kokum* products.

Saravanan *et al.* (2002) reported that the constraints of cashew nut processing units in Tamil Nadu. Constraints reported by the processors, were high wage rate exporters by most of the processors (86.67%) in Kanyakumari district more than 80 per cent of processors felt that the declining trend in imports and inadequacy in supply of raw materials from domestic market were major problems constitute for them. High purchase tax for raw nut at 8 per cent purchased in domestic market and increasing competition from other countries in processing were the constraints faced by more than 60 per cent of the respondents, other problems were frequent power cuts during the processing period and wide fluctuation in the prices of cashew kernel.

Varghese and Indus Singh (2006) in their study of prospects and problems of agro processing industries in Biknner district of Rajasthan. They identified the technological factor, resource based factor and policy based factors were the major constraints faced by agro processors in the study area. Problems were identified by the above mentioned researcher by conducting opinion surveys. These problems were found to be obstacles in smooth working of the business enterprises. Hence, efficient measures were suggested to tackle the problems and facilitate the smooth functioning of the enterprises.

Vasudeva Naik (2009) conducted on the economic analysis of processing and marketing of paddy in Siruguppa taluk of Bellary district. Majority of small millers (53.33 per cent) expressed lack of working capital to procure adequate quantity of raw materials as their major problems. Only 14.28 per cent of large millers felt lack of capital as their constraints. This strengthened easier observations that due to limited working capital base, small size rice millers failed to achieve better capacity utilization. Therefore, small size units need to be encouraged with suitable financial assistance. In the case of large size millers, higher prices of raw materials (71.43 per cent) and lack of timely transport services (78.57 per cent) coupled with higher cost of transportation (71.43 per cent) were their major problems. In order to procure the large quantity of raw materials during peak season, the large size miller might had to compete with other millers by way of offering higher prices. Similarly, during procurement of paddy from distant places to meet their processing requirements for the year, large size millers might had faced constraints in cost of transportation. Hence, Association of Rice Millers might arrange the transportation facilities.

Mundad (2011) studied the problems faced by the FCIGs (Farmers Commodity Interest Groups) in organizing, pooling and marketing of the commodities indicating socioeconomic status of the farmer was a major problem expressed by member farmers in organization. When it came to pooling of commodities, majority of the FCIGs faced the high cost of transportation as the major problem, followed by scarcity of labours during peak period. Regarding marketing problems, proximity to market and high cost of transportation were the major ones as expressed by the respondents.

Venkateswaran *et al*. (2011) examined the brand preference of selective household brands Fast Moving Consumer Goods (FMCG's) at Dindigul, Tamil Nadu. The study observed that in forming tendency of customers to prefer a particular brand, the market variables like advertisement, quality of product, brand name and image played essential role. So a market must understand how consumer made the purchase decision towards the brand. And also observed factors influenced the consumer to go for purchase decision.

METHODOLOGY

This chapter deals with the description of the study area, the sampling technique adopted, the nature and sources of the data, the method of data collection and the various tools and techniques employed in analyzing the data and evaluating the results. This chapter, apart from aforesaid aspects, also contains the precise definition and explanations of some of the most important concepts and terms used in the study to facilitate clear understanding of the issues with which the present study is concerned. The present chapter is presented under the following major headings.

3.1) Description of the study area

3.2) Sampling design adopted

3.3) Nature and Sources of data

3.4) Organizational Structure of the Factory

3.5) Identification of performance indicators

3.6) Analytical techniques employed

3.7) Definition of terms and concepts used in the study

3.1 Description of the study area

Belgaum district of Karnataka state was purposively selected for studying the business performance of Malaprabha Co-operative Sugar Factory Ltd-M.K.Hubli.

Study Region

Karnataka State is situated in the West Central part of Peninsular India. It is located at 15°00' N 75° 00' E and it consists of a narrow elongated belt between the Arabian Sea and the Western Ghats and enhancing coastline of about 400 km.

The present study was conducted in the Belgaum district of Karnataka. Belgaum is located at 15.87°N 74.5°E[10]. It has an average elevation of 751 meters (2463 feet). The district is situated in the North Western parts of Karnataka, Maharashtra and Goa on the Western Ghats (50 km from Goa state border). It is one of the oldest towns in the state, lying at a distance of 502 km from Bangalore; 515 km from Hyderabad and 500 km from Mumbai. The district comprises 1278 villages with an area of 13,415 Sq.km with a population of around 48 lakhs or 4.8 million (47, 78,439) according to the Census Report 2011. It is situated near the foothills of the Sahyadri Mountain Range (Western Ghats) at an altitude of about 779m, 100 km from the Arabian Sea with the river Markandeya flowing nearby, Belgaum exhibits swift and kaleidoscopic changes in topography, vegetation and climate.

Belgaum district is a part of the Transitional Zone of Karnataka. It is at its coldest in Winter (November - February temperatures dropping to 9 Degrees Celsius), and experiences continuous monsoon during July to September. The annual average rainfall is over 200 cm (2000 mm).

As per 2011 Census Report of India, Belgaum district has a population of 47, 78,439. Males constitute 51.55 per cent of the population and females 48.45 per cent. Belgaum has an average literacy rate of 73.94 per cent, higher than the national average of 65 per cent; with 82.90 per cent of the male and 64.74 per cent of female literates. Eleven per cent of the population is under 7 years of age. Here, majority of the population is Kannadigas followed by Marathi's and Urdu speaking Muslims. Belgaum is a cosmopolitan city as people from all over India dwell here.

Belgaum APMC stands second to Bangalore APMC in terms of agricultural produce marketing. It is an important location for vegetables, fruits, meat, poultry, fish and wood production. Belgaum is a major producer of milk in the state, with almost 1/3 or 30 per cent of state's production & has the highest number of Sugar Factories. Malaprabha Cooperative Sugar Factory Ltd- M.K.Hubli is one of the major sugar factories among ten co-operative sugar factories working in Belgaum district.

3.2 Sampling Design

Business performance of Malaprabha Cooperative Sugar Factory Ltd required different sources of data. The study was based on primary and secondary data. The secondary data were collected from the published annual reports and other publications of the sugar factory and primary data were

Fig. 1: Map Showing the Study Area

Fig 1. Map Showing the Study Area

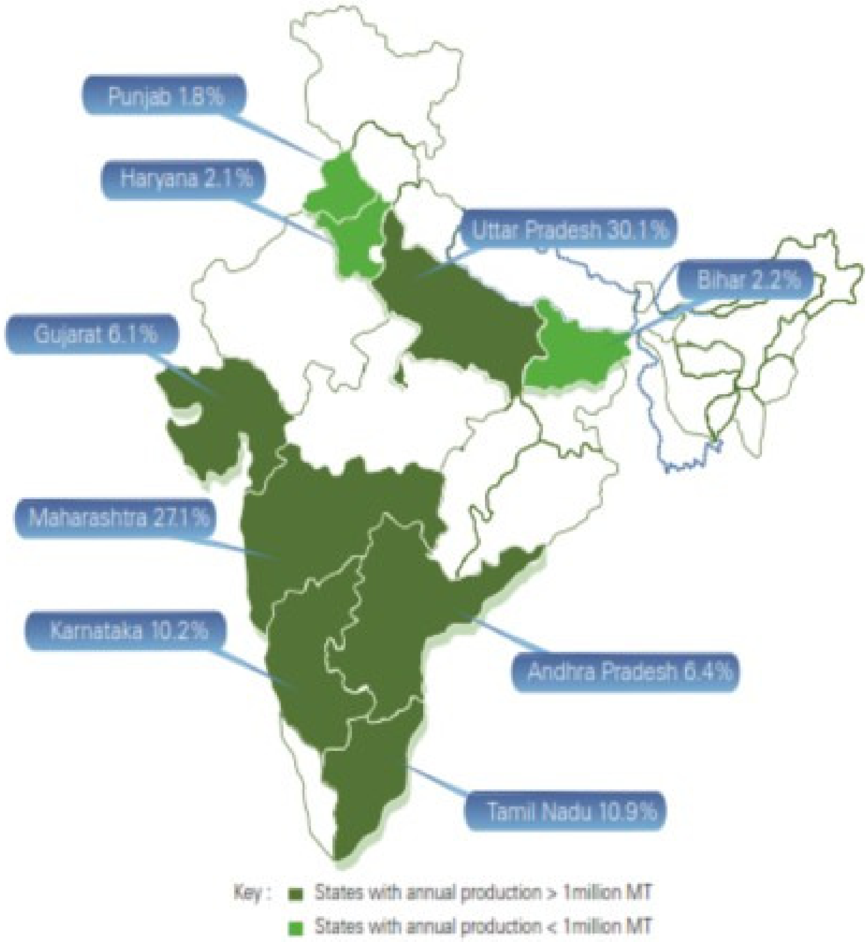


Fig. 2: Sugar producing states in India

Fig 2. Sugar producing states in India

Plate 1. Malaprabha Cooperative Sugar Factory Ltd-M.K.Hubli

collected from the concerned persons of the management at different levels for eliciting the information.

3.3 Nature and Sources of Data

1) The information regarding investment on land, building, machinery, infrastructure and fixtures was collected from factory offices from 1971-72 to 2011-12.

2) The data on cane procurement and processing, like installed capacity, volume of cane crushed, sugar production, recovery per cent age of sugarcane and payment mechanism were collected from sugar factory offices for a period of fifteen years from 1997-1998 to 2011-2012 from the Malaprabha Cooperative Sugar Factory Ltd-M.K. Hubli.

3.3.2.1 Data related to procurement of sugarcane

The data pertaining to the sugarcane procurement by the factory were collected from the records maintained by the Chief Cane Development Officer (CCDO) of the agriculture section.

The data were collected under the following headings.

1. Total number of grower members
2. Sugarcane area under area of operation
3. Sugarcane area under registered members
4. Average yield per hectare
5. Duration of the season
6. Modes of transportation over the years
7. Mode of payment of sugarcane bill over the years
8. Month wise planting and harvesting schedule
9. Targets and achievements
10. Sugarcane procurement costs

3.3.2.1 Data related to processing of sugarcane

The data pertaining to sugarcane processing are obtained from Chief Chemist. The data pertaining to processing were collected under the following headings.

1. Sugarcane crushed
2. Recovery per cent of sugar, molasses. bagasse, filter cake
3. Sugarcane quantity crushed and capacity utilization for season
4. Duration of the season
5. Sugarcane crushed and recovery per cent trend at yearly intervals
6. Sugar production and different grades of sugar produced in the season
7. Cost of production of sugar

3) For studying physical and financial performance of sugar factory, the data relating to physical aspects were collected from the yearly summary statements of sugar factory. The data relating to financial aspects such as balance sheet, profit and loss account, receipts and payments account and trading accounts of the factory for a period of fifteen years from 1997-1998 to 2011-2012, were also collected from the yearly summary statement of Rani Sugar.

4) For studying marketing management of sugar and by products to the profitability of the factory, the data on molasses, filter cake etc of factory data were collected from the factory offices for a period of fifteen years from 1997-1998 to 2011-2012 from the Malaprabha Cooperative Sugar Factory Ltd-M.K.Hubli.

3.3.4.1 Data relating to marketing management of sugar and its by-products

The data pertaining to the sales of sugar and by products were obtained from the Sales section of the Rani Sugar.

The data pertaining to sugar and its by-products sales were collected under the following heads.

1. Sugar sales : Levy quota and Open market sales
2. Costs and Return per quintal of sugar
3. Channels of marketing
4. Price spread of sugar

5) For the studying of problems faced by the Malaprabha Cooperative Sugar Factory Ltd, the related data on perception were collected from management cadre people from the Malaprabha Cooperative Sugar Factory Ltd-M.K.Hubli.

3.4 Organizational structure of the Malaprabha Cooperative Sugar Factory Ltd.

The existing organizational structure is presented in Fig. 3. The organization in this Cooperatives Sugar Mill consists of two organically linked elements, one consisting of the democratic elements safeguarding the cooperatives principles i.e. General Body and Board of Directors at the top and other consisting of paid management i.e. Manager, Technicians, Workmen. The administrator will be appointed by Government when the Board ceases to function. Top level management formulates the business policy and is responsible for planning, coordination and control of organizational affairs. Below it, there is executive committee from amongst Board Members and Chairman will be elected to do the business assigned by the Board like checking of weekly or quarterly progress of the enterprise, resolving the disputes and problems of employees etc. At the executive level, there is a Managing Director (MD) to look after the working of entire factory. He is assisted by Departmental Heads, and technical persons of factory. Thereafter, there is working force under Departmental Heads. The executive level in this structure can be divided into two groups technical and non-technical. Technical force consists of engineers and chemists while non-technical side consists of administrative persons and their operating staff.

3.5 Identification of performance indicators

In all, 32 performance indicators were identified which were related to the functioning of the factory; of them, eight indicators were related to physical aspects and they were termed as physical indicators, while the remaining 24 indicators related to the financial aspects of the factory they were termed as financial indicators. The physical and financial indicators are presented in Table.1.

3.6 Analytical Techniques employed

In order to analyze the objectives of the study, the data collection were subject to analysis through appropriate techniques as follows:

1. Tabular Analysis
2. Compound Growth Rate Analysis
3. Financial Feasibility Analysis
4. Financial Ratio Analysis
5. Break Even Analysis

3.6.1 Tabular Analysis

The data collected were presented in tabular form to facilitate easy comparisons. The investment pattern, cost of procurement, marketing management and problems faced by the factory were studied using tabular analysis. The data were summarized with the help of statistical tools like averages and per cent ages to obtain meaningful inferences.

3.6.2 Break Even Point Analysis

This analytical tool was employed to find out the quantity of sugar to be manufactured to cover all the fixed cost. The Break Even Point (BEP) acts as the gate way for the profits to the sugar factory.

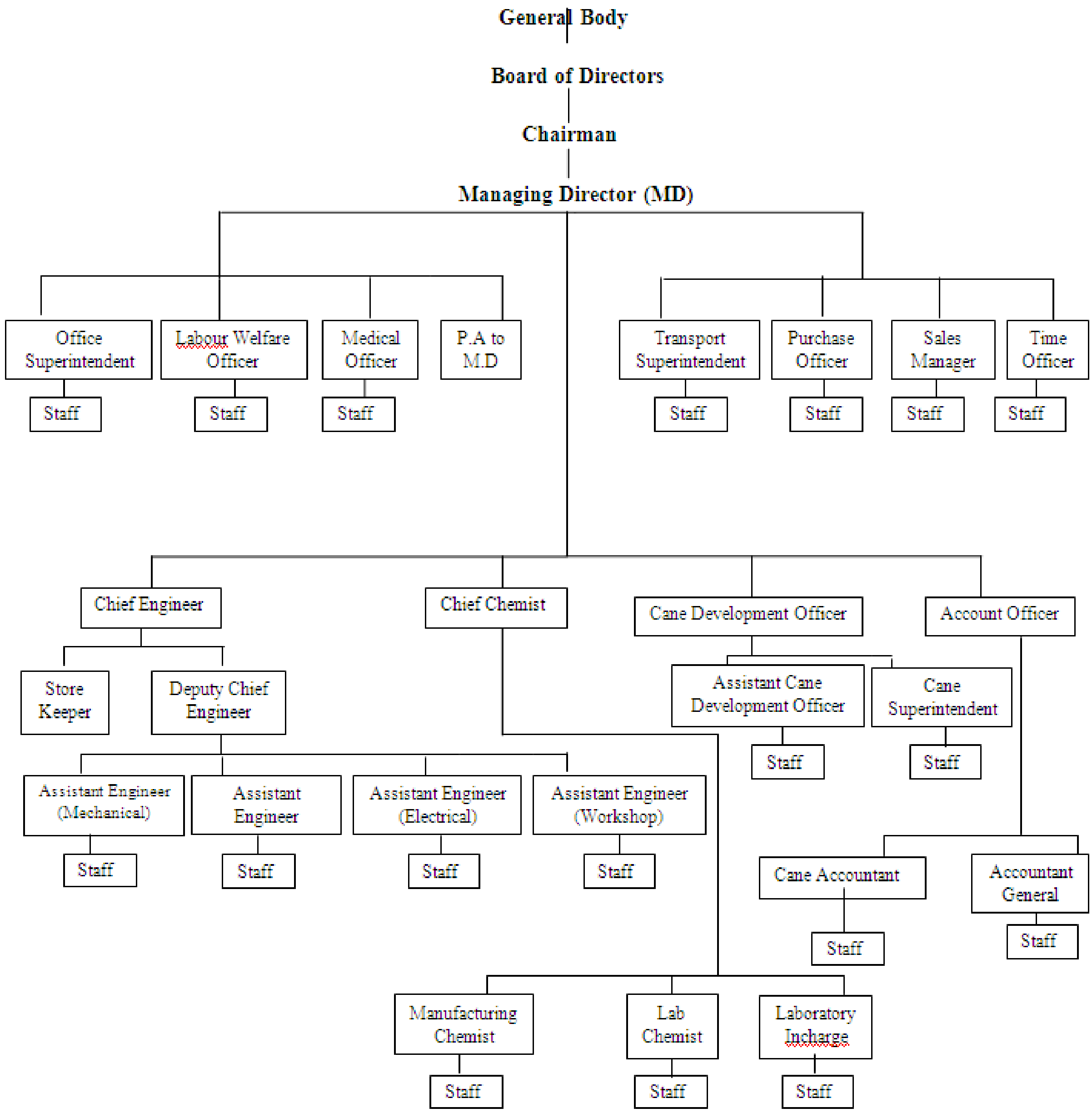


Fig 3. Organizational Structure of Malaprabha Cooperative Sugar Factory Ltd.

Table1: Physical and Financial Indicators selected for analysis

Physical Indicators:	Financial Indicators:
1. Cane area	1. Share capital
2. Average cane yield	2. Reserve funds
3. Sugar production	3. Equity
4. Installed capacity	4. Owned funds
5. Cane crushed	5. Net profits
6. Recovery percentage	6.Borrowings
7. Duration of crushing	7. Current liabilities
8. Capacity utilization	8.Total liabilities
	9.Sugar inventory
	10.Sale of by-products
	11. Sugar sales
	12. Total sales
	13 Total inventory
	14. Current assets
	15. Net working capital
	16. Fixed assets
	17. Total assets
	18. Opening stock
	19. Closing stock
	20. Average inventory
	21. Total income
	22. Total purchases
	23. Total expenses
	24. Net worth

BEP was calculated using the following formula

$$\text{BEP} = \frac{\text{Total fixed cost}}{\text{Price-Average variable cost}}$$

Total fixed cost included

1. Salaries and wages
2. Welfare expenses
3. Provision for bonus
4. Auditors expenses
5. TA and setting charges
6. Printing and stationary expenses
7. Meeting expenses
8. Maintenance of buildings
9. Depreciation of plant and machinery

Variable cost included:

1. Prime cost of cane
2. Purchase tax on cane
3. Cane harvesting and transportation charges
4. Cane development expenses
5. Cane incentives
6. Machinery repairs and maintenance and manufacturing expenses
7. By-product removal charges

3.6.3 Compound Growth Rate Analysis

An exponential function of the following type is fitted to estimate the growth rates.

$$Y = ab^t$$

Where

Y	= Indicator/Variable
t	= Years (time)
a	= Intercept/Constant
b	= Regression Coefficient
	= (1 - r/100)
	= rate of change in Y per unit change in time

Hence, Annual Average Growth Rate (per cent age) is = r = (b - 1) x 100

The above said function is employed to estimate the compound growth rates of physical and financial indicators of the sugar factory for a period of fifteen years (1997-1998 to 2011-12).

The important physical indicators considered for estimation of compound growth rates of the sugar factory were, installed capacity, cane crushed, sugarcane produced, average recovery per cent age of sugarcane and duration of crushing season, and the important financial indicators considered were, share capital, reserve funds, owned funds, current assets, fixed assets, total assets, borrowings, current liabilities, total liabilities, total sales, gross income, total expenses, inventory and net profit.

3.6.4 Financial Feasibility Analysis

Investment analysis techniques were carried out to evaluate the feasibility of investment in sugar factory. The discounted cash flow technique which had an advantage of reducing the cash flows to a single point of time was used to facilitate the comparison

For project evaluation, the following techniques were used in the study to evaluate the feasibility of the investment in sugar processing unit.

a) Net Present Value (NPV)

b) Benefit Cost Ratio (BCR)

c) Internal Rate of Return (IRR)

d) Pay Back Period (PBP)

(a) Net Present Value (NPV)

This indicated the present value of expected or realized net cash flows or returns of the project over its life time when discounted at the opportunity cost of capital.

The NPV was worked out as follows:

$$NPV = \Sigma \frac{Y_t}{(1+r)} - I$$

Y= Net returns in period t

t = 1…………….n

r = Discount rate

I = Initial Investment

(b) Benefit Cost Ratio (BCR)

The benefit cost ratio was worked out by discounting the net returns during the life period of the sugar processing unit at a discount rate of 16 per cent per annum. The formula used was:

$$\text{B:C Ratio} \quad \frac{\text{Discounted Net Returns}}{\text{Initial Investment}}$$

(c) Internal Rate of Return (IRR)

It is the discount rate which makes the net present value of the project benefits equal to zero. It is usually determined by Trial and Error Method. In this study also IRR was computed by Trial and Error Method. For this, the discount rate was too low and which the NPV positive and another discount rate which was too high and which made the NPV negative were ascertained. Then, the IRR was estimated as follows:

$$\text{IRR} = \text{Lower discount rate} \quad \frac{\text{Present worth of cash flows at lower discount rate}}{\text{Sum of the two NPVs ignoring the negative sign}} \quad \text{x [difference between worth of cash stream at 2 rates]}$$

The project is considered to be feasible, if the IRR is higher than the prevailing bank interest rate.

(d) Pay Back Period (PBP)

It indicated the number of years required to recover the initial investment made in sugar mills. The method followed was to successively add the net returns from each production year until the investments were completely recovered. Since, the cash flows from sugar mills were not uniform; the payback period was calculated by successively reducing the net cash flows from outstanding investments.

3.6.5 Financial Ratio Analysis

The analysis pertaining to financial efficiency of sugar processing unit was assessed by computing certain performance ratios. The physical performance indicators like cane area, crushing particulars were used to study the physical progress. Growth rates were calculated for important physical and financial performance indicators of the Malaprabha Cooperative Sugar factory Ltd- M.K. Hubli.

Ratios are the measures of results obtained from a business. In order to know the performance of the sugar factory, the financial ratio analysis, an effective tool providing the summation of the performance of a business organization, has been heavily relied upon. The ratios relating to solvency, liquidity, profitability, turnover, efficiency and financial strength of the factory had been analyzed. To highlight each of the above aspects, different ratios under each category had been worked out.

The secondary data drawn from the audited annual statements of the balance sheet, annual reports, receipts and payment account, profit and loss account of the sugar factory for a period of fifteen years from 1997-1998 to 2011-12 were subjected to rigorous financial ratio analysis. The following financial ratios are used for the present study.

1. Test of Liquidity
2. Tests of Solvency
3. Tests of Efficiency and Profitability
4. Tests of Financial Strength
5. Fixed Assets Ratios

3.6.5.1 Test of Liquidity

For continuous operation of a business organization, its liquidity would be basic. The liquidity ratios, also called as balance sheet ratios, are used to measure the ability of an enterprise to possess adequate cash to meet the immediate cash obligations. The degree of liquidity of the sugar factory was determined by employing the following ratios.

There are four types of test of liquidity

1) Current Ratio
2) Acid Test Ratio
3) Liquid Assets to Total Assets Ratio
4) Inventory Turnover Ratio

(a) Current Ratio

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The current ratio would give the relationship between current assets and current liabilities of the sugar factory. A ratio greater than one suggested that, the current assets of the factory were adequate to pay off all current liabilities. If the ratio was one, it indicated the current assets were just sufficient to meet the current liabilities. A current ratio of 2:1 was considered to be satisfactory and indicated the extent to which short term claims could be met by the current assets that could be readily convertible into cash. Generally, the higher the value of ratio better would be the safety margin and technical solvency of an organization.

The two basic components of this ratio were current assets and current liabilities. Current assets included cash and those assets which could be easily converted into cash within a short period of time, generally, one year such as marketable securities or readily realizable investments, accounts receivable, sundry debtor (excluding bad debts or provisions), inventories, work in progress, etc. Pre-paid expenses and accrued income should also be included in current assets because pre-paid expenses represent payments made in advance for goods and services to be received in the near future and accrued income means income earned by providing a services or selling product, but yet to be received.

The current liabilities included sundry creditors, taxes payable, bills payable, short term loans and advances, outstanding expenses, accrued expenses and dividend payable.

(b) Acid Test Ratio

This ratio is also called as Quick Ratio or Near Money Ratio, represents the ratio between quick assets and current liabilities. This refers to the ability of firm to pay its short term obligations as and when they become due. It is computed by using the following formula.

$$\text{Acid Test Ratio} = \frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}}$$

This ratio was used as complimentary ratio to the current ratio. Liquid ratio is more rigorous test of liquidity than the current ratio, because it eliminates inventories and prepaid expenses as a part of current assets, Usually, a high liquid ratio an indication the firm is liquid and has the ability to meet its liquid liabilities in time and on the other hand a low liquidity ratio represents that the firms' liquidity position is not good. As a convention, generally a quick ratio of "one to one" (1:1) was considered to be satisfactory.

(c) Liquid Assets to Total Assets Ratio

$$\text{Liquid Assets to Total Assets Ratio} = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

This ratio is used to show the degree of liquidity adopted by a business organization and reflects the changes in the liquidity position of the sugar factory over the years in the present study.

This ratio was found to be indicated that for every rupee of asset, one paise was available in the form of liquid assets.

Liquid assets included cash on hand and in bank, inventory, bill accounts receivable and deposits in banks which could be readily withdrawn on demand. On the other hand, total assets included current and fixed assets as shown in the balance sheet of the sugar factory.

d) Inventory Ratio

$$\text{Inventory Turnover Ratio} = \frac{\text{Inventory}}{\text{Net Working Capital}}$$

Where,

Net working capital = Current assets – Current liabilities

This ratio measures the extent to which the net working capital financing the current assets, mainly the inventory, which carried a low degree of liquidity. If this ratio is equal to one, it means that net working capital of the sugar factory was tied up in inventory.

3.6.5.2 Tests of Solvency

Three types of test of solvency are

1) Total Debt Ratio
2) Fixed Assets to Owned Funds Ratio
3) Debt – Equity Ratio

The solvency ratios would reflect on the medium and long term solvency position of the sugar factory, indicating its ability to meet the medium and long term obligations and these ratios would provide basis for measuring the leverage effect on the performance of the sugar factory. The solvency position of sugar factory was computed by employing the following ratios.

a) Total Debt Ratio

This ratio is obtained as given below:

$$\text{Total Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Debt+ Net Worth}}$$

Total debt included short and long term borrowings from financial institutions, debenture/bond deferred payment arrangements for buying capital, capital equipments and borrowings, public deposits and any interest bearing loan. The relationship describing the lenders contribution for each one rupee of the owner's contribution.

b) Fixed Assets to Owned Funds Ratio

This ratio is computed by dividing depreciated fixed assets by the owned funds of the sugar factory.

$$\text{i.e., Fixed Assets to Owned Funds Ratio} = \frac{\text{Depreciated value of Fixed Assets}}{\text{Owned Funds}}$$

Fixed assets included land, building, plant and machinery, furniture's and fixtures, office equipments, vehicles, laboratory, etc. These assets remain fairly permanent.

The ratio of fixed assets to owned funds explained the extent of owned funds invested in fixed assets indicated that higher ratio was associated with problem of liquidation, because, the claims of the owners had to be met by sale of fixed assets, which were in non – liquid form.

c) Debt – Equity Ratio

$$\text{Debt – Equity Ratio} = \frac{\text{External Equities}}{\text{Internal Equities}}$$

External Equities: It meant those proportions of funds which were provided by outsiders such as Long term loans, Debentures, Creditors, Outstanding expenses, Income Tax Payable, Provision for Taxation, Proposed Dividends, Bills payable, Bank over Draft and Unclaimed Dividends.

Internal Equities: It meant those proportions of funds which were provided by share holders. Such as Equity Share Capital, Preference Share Capital, Capital Reserves, Sinking Fund, and Profit and Loss Account.

The debt – equity ratio showed the relation between external equities and the internal equities of a business organisation and could measure the relative dependence of the organization on internal and external equities. Too much dependence on external equities and borrowings might indicate under capitalization, resulting in shortage of working capital, while too much dependence on internal equities might lead to over capitalization, resulting in inadequate return on proprietary funds to meet the long-term obligations. It throws light on the extent of indebtedness in the farm business or conversely the amount of capital raised by the factory in running the business. A consistently falling ratio indicated a very heartening performance of factory and the ability of the factory to reduced dependence on borrowings. A ratio less than 3:1 signified the financial soundness of the organization regarding its debts and equity positions.

3.6.5.3 Tests of Efficiency and Profitability

The tests of efficiency indicated the utilization of capital and income, where as the profitability tests were meaningful measures which could be used to diagnose the financial status and the overall efficiency of business organization.

The efficiency and profitability of the sugar factory was measured by employing the following ratios.

1) Efficiency of Capital Ratio
2) Gross Profit Ratio

a) Efficiency of Capital Ratio

This ratio was used to evaluate the efficiency of the sugar factories in regard to their capital utilization. A higher value of efficiency of capital ratio indicated judicious use of capital,

$$\text{Efficiency of Capital Ratio} = \frac{\text{Paid up Share Capital}}{\text{Annual Sales Value}}$$

b) Gross Profit Ratio

This ratio was computed as given below

$$\text{Gross Profit Ratio} = \frac{\text{Sales - Cost of goods sold}}{\text{Sales}}$$

This entire ratio should be less than one to indicate the profitable run of the firm business. This ratio measured the total expenses for every ₹1 gross income. A ratio less than 1 indicated that the total expenses were less than the gross income.

3.6.5.4 Tests of Financial Strength

The following measures were employed to assess the real worth of the sugar factory.

1) Net Worth
2) Net Capital Ratio

a) Net Worth

Net Worth = Total Assets – Total Liabilities

Net Worth measured the excess of assets over the liabilities. Wider the positive difference, financially stronger would be the sugar factory.

b) Net Capital Ratio

This ratio would reflect the financial strength of a business organization.

$$\text{Net Capital Ratio} = \frac{\text{Total Assets}}{\text{Total Liabilities}}$$

The higher the ratio, the greater would be the margin of safety against the decline in the prices of major assets of the sugar factory.

It indicates the long term liquidity position of the factory. If the net capital ratio is more than one, the funds of factory are safe. The net capital ratio is more than unity. This indicated that, the assets are sufficient to cover all the liabilities.

3.6.5.5 Fixed Assets Ratios

These ratios acted supplementary to the earlier ratios. The important five fixed assets ratios considered in the present study are described below.

1) Return on Share holder Equity
2) Return on Total Assets (ROTA)
3) Fixed Asset to Total Asset Ratio
4) Fixed Assets to Net worth Ratio

5) Fixed Assets to Total Sales Ratio

The data regarding the total expenses and gross income were drawn from the profit and loss account of the sugar factory over a period of time. The gross income after deducting revenue expenses net profit as shown in profit and loss account was considered.

(a) Return on Share holder Equity

This ratio revealed the extent of profitability in relation to investment of owned funds of the sugar factory and was computed as under.

$$\text{Return on Share holder Equity} = \frac{\text{Profit after Tax}}{\text{Net Worth}}$$

(b) Return on Total Assets (ROTA)

This ratio indicated the rate of profit earned on the total assets employed and was computed as given below.

$$\text{Return on Total Assets} = \frac{\text{EBIT}}{\text{Total Assets}}$$

EBIT= Total revenue-variable cost- fixed operating cost

EBIT- Earning before interest tax

This ratio represented the earning capacity of the total assets of the sugar factory over a given period of time.

(c) Fixed Assets to Total Assets Ratio

This ratio was worked out using the following formula.

$$\text{Fixed Assets to Total Assets Ratio} = \frac{\text{Fixed Assets}}{\text{Total Assets}}$$

This ratio would reflect the proportion of fixed assets in the total assets of the sugar factory. The higher the ratio depicted the higher the per cent age of the fixed assets to total assets.

(d) Fixed Assets to Net worth Ratio

This ratio was computed by dividing fixed assets by the net worth of the factory at a given point of time. i.e.

$$\text{Fixed Assets to Net worth Ratio} = \frac{\text{Fixed Assets}}{\text{Net Worth}}$$

(e) Fixed Assets to Total Sales Ratio

This ratio was worked out as follows.

$$\text{Fixed Assets to Total Sales Ratio} = \frac{\text{Sales}}{\text{Fixed Assets}}$$

3.6.6 Estimation of Capacity Utilization

Consistent with the objectives of the present investigation, capacity utilization as a per cent of the installed capacity was computed for the sugar factory.

The capacity utilization was computed using the following formula.

$$\text{Capacity Utilization (In \%)} = \frac{\text{Cane crushed during the year}}{\text{Installed crushing capacity X 210 days capacity/day}} \times 100$$

In the above formula, 210 working days were considered, as a sugar factory could work for a period of 210 days in a year, if the cane supply could be streamlined for the purpose. The number of days for which a sugar factory could work was considered based on the official record of the sugar factory.

3.6.7 Area of operation of Malaprabha Cooperative Sugar factory Ltd

Distance from the factory site (kms)	Number of Zones	Number of Circles	Number of Villages covered
0-15	5	35	310
15-30	3	20	190
30-45	3	10	85
Total	11	65	585

To carry out the operation the entire area was divided into zones, each zone consists of circles and each circle consists of group of villages.

0-15km radius area from the factory premises consisted 5 Zones, 35 Circles and 310 Villages while 15-30 km radius from the factory premises consisted 3 Zones, 20 Circles and 190 Villages.

Three Zones, 10 Circles and 85 Villages were found in 30-45 km radius area for the purpose of cane procurement and cane development activities of the factory.

3.6.8 Staffing pattern for Agriculture Section

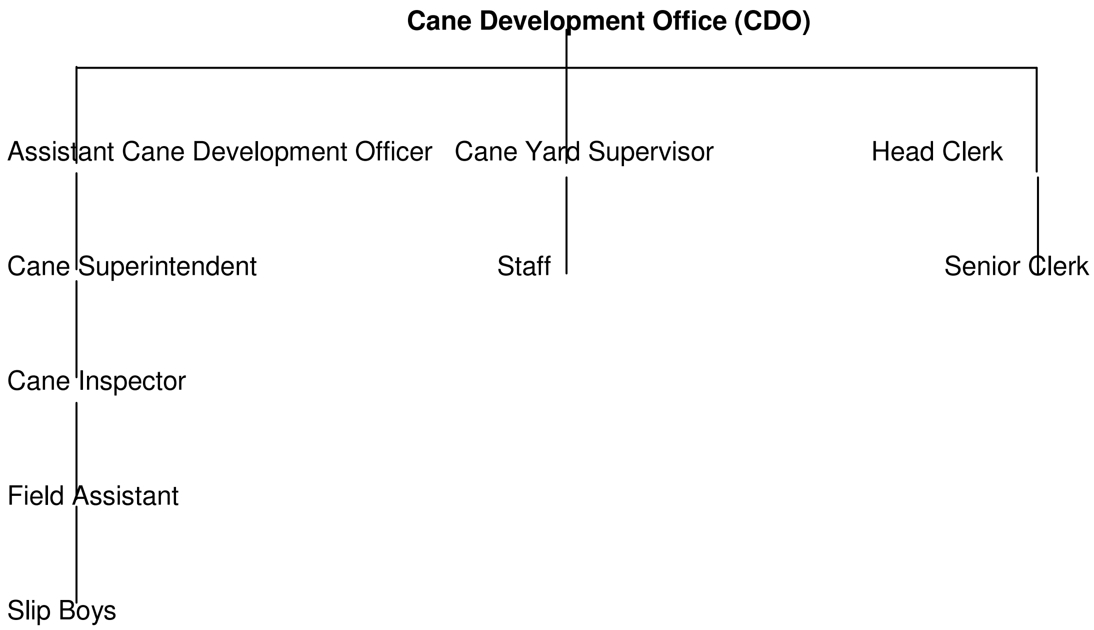


Fig. 4: Staffing Pattern of Agriculture Section

Staffing pattern of agriculture section is presented in above Fig 4. The responsibilities of agriculture section included procurement and development of sugarcane in the area of operation.

Chief Cane Development Officer: He is the overall incharge of procurement of sugarcane to the factory and development of sugarcane in the area of operation.

Cane Superintendent: Looked after the regular supply of cane to the factory depending upon the daily requirement of sugarcane for processing, arrangements of transportation of sugarcane from the farmers' field to factory gate.

Cane Inspector: They are incharge of road repair, preparation of the harvesting schedule, holding meeting with farmers, distribution of seed materials, taking up the demonstration plots in the farmers field, issuing of cutting order of the sugarcane, arrangement of transportation of harvested sugarcane to the factory and road repair work.

Field Assistants: They looked after the registration of cane area of members based on variety, date of planting, checking of cane brix, pre-harvest maturity survey of sugarcane in the area of operation, estimation of sugarcane production plot, issue of cutting order of sugarcane to the members.

Cane Yard Supervisor: They assess the quality of sugarcane at the gate. Arrange for weighment and the deduction to be made from the cane procured. They also recorded the number of vehicles at the gate and thus balance the vehicle at the gate based on daily requirement.

Slip Boys: They are seasonal but permanent workers. They look after the harvesting of cane, assessing the quality aspects of cane, issuing of field slips after loading of the sugarcane.

3.6.9 Ranking Method

A ranking is a relationship between a set of items such that, for any two items, the first is either 'ranked higher than', 'ranked lower than' or 'ranked equal to' the second. In mathematics, this is known as a weak order or total preorder of objects. It is not necessarily a total order of objects because two different objects can have the same ranking. The rankings themselves are totally ordered. For example, materials are totally preordered by hardness, while degrees of hardness are totally ordered.

The ranking system is a non–quantitative method of comparing different alternatives. A ranking list is developed showing the better variants for a specific problems.

3.7 Socio Economic features of the Study Area

The Table pertaining to the socio-economic features of the beneficiaries of M. K. Hubli sugar factory are presented in Table 2.

1) Age: Majority (46.67%) of the beneficiaries belonged to middle age, while 33.33 and 20.00 per cent of them were young and old age respectively.
2) Education: the Table revealed that 33.33 per cent of the beneficiaries had high school education while 23.34 per cent had college education. Considerable proportions (20.00%) of the beneficiaries were primary and middle education while 13.33 per cent of the beneficiaries had degree and only 10.00 per cent of them were illiterates.
3) Type and Size of the family: A high proportion (52.00%) of the beneficiaries belonged to joint families while 48.00 per cent of them belonged to nuclear families.

The Table also revealed that majority (50.01%) of the beneficiaries had family size of 5-8 members, while 25.33 per cent had more than 9 family members and about 24.66 per cent of them had size of 1-4 members.

4) Land holdings: The data indicated that 38.67 per cent of the beneficiaries had small size lands of 4.38 to 6 acres while 31.32 per cent of them had medium sized lands of 6 to 24 acres and 30.00 per cent of beneficiaries had marginal land size up to 4.38 acres and a meager per cent (0.01%) of beneficiaries had bigger land holding of above 25 acres.
5) Caste: Majority (50.00%) of the agricultural lands possessing beneficiaries belonged to backward community while, 39.33 and 10.67 per cent of the beneficiaries belonged to forward communities, scheduled caste and scheduled tribes respectively.

Table 2: Socio-Economic features of the Study Area

Variables and Category	Beneficiaries	
	Number	Percentage
1. Age		
Young (up to 30 years)	5000	33.33
Middle (31 to 55 years)	7000	46.67
Old (56 and above)	3000	20.00
2. Education		
Illiterates	1500	10.00
Primary and Middle (1-7th Std)	3000	20.00
High School (8-10th Std)	5000	33.33
College (Pre and Above)	3500	23.34
Degree holders	2000	13.33
3. Type and Family size Joint		
(1-4 members)	1500	10.00
(5-8 members)	3500	23.34
(9 and Above)	2800	18.66
Nuclear		
(1-4 members)	2200	14.66
(5-8 members)	4000	26.67
(9 and Above)	1000	6.67
4. Land holdings		
Marginal (up to 4.38 acres)	4500	30.00
Small (4.38 to 6 acres)	5800	38.67
Medium (6 to 24 acres)	4698	31.32
Big (25 and above)	2	0.01
5. Caste		
SC and ST community	1600	10.67
Backward community	7500	50.00
Forward community	5900	39.33

Source : Village Accountant Office Records M.K. Hubli

3.8 Definition of Terms and Concepts used in the Study

Agro Based Industries: Industries are based on agricultural raw materials (or) industries which are based on agricultural raw materials are called as agro based industries.

Ex: Cotton, jute, silk, woolen textiles, sugar and edible oil, etc.

Accrued income: these are the benefits which firm has earned, but they have not been received in cash yet. Ex: Accrued dividend, Commission, Interest.

Accounting year: It is the period from 1st April to 31st March every year during which quantity of sugarcane procured, crushed, processed into sugar, and sugar bagged and by products produced.

Adsali Sugarcane: Ideal planting time is June to August. After the harvest of winter crop or harvest of previous sugarcane crop, apply manure and plough the field.

Average Inventories: It computed as the average of opening and closing balances (stocks).

A-Class: Sugarcane registered grower's means the share holder of the factory and these are having ₹5000share per grower

B-Class: Non-sugarcane registered growers and employee of the factory.

C-Class: Cooperative societies

Bank Interest Rate: Bank Rate is the standard rate at which RBI is prepared to buy or rediscount bills of Exchange or other eligible commercial paper from Banks. Bank Rate in other words is a facility of credit at minimum rate of interest from RBI to Banks. At present the Bank Rate has been increased from 6 to 9 per cent.

Break Even Point: It is the quantity of sugar that should be produced and marketed so as to cover all the fixed costs, when this quantity is reached, then factory earn profit from trading.

Borrowings: Receiving something of value in exchange for an obligation to pay back something of usually greater value at a particular time in the future.

Bagasse: After crushing of sugarcane in sugar mills and extraction of juice from prepared cane by milling, discarded fibrous residual matter of cane which come to about 28 to 30 per cent by weight of cane, called Bagasse. Bagasse is obtained as sugarcane residue. It contains around 50 per cent moisture and 2 per cent sugar and balance is fibrous material.

Cane: The whole of the material as delivered to the cane carrier i.e. comprising clean cane, field trash, water and adhering dirt etc.

Cost of procurement of sugarcane: It is calculated by using procurement expenses i.e. incurred in procurement of sugarcane i.e. prime cost of cane, purchase tax on cane purchase, turn over the cane purchase, cess on cane purchase, cane transportation and harvesting charges, cane purchase incentive, etc.

Current Assets: A balance sheet account that represents the value of all assets that are reasonably expected to be converted into cash within one year in the normal course of business. Current assets include cash, accounts receivable, inventory, marketable securities, prepaid expenses and other liquid assets that can be readily converted to cash.

Current Liabilities: These are debts payable with in accounting period. The various items included in this group are salary (with bonus), wages, accounts payable, subsidies, dividend and the sundry creditors, outstanding expenses.

Commission Charge: It is cost of margins given to the different sources for raw materials particularly in case of non-registered dealers.

Cane incentives: Government will give incentives to factory i.e. ₹ per metric tonne.

Cess on cane purchase: It is tax given by the factory to the State Government.

Cane Harvesting Charges: It is charge given to farmers for cane cutting in the field level.

Cane Transport Charges: It is charge given to farmers or contractors for transporting sugarcane from field to factory premises.

Cane Development Cess: This is charge given to the farmers to cane seed treatment and development.

Equity: A stock or any other security representing an ownership interest.

Fiber: The dry, water insoluble matter of cane.

Filter cake: The residue removed from muddy juice or setting by filtration.

Fixed Assets: This includes investments on different items like machinery, equipments, land and building, furniture and fixtures and other fixed assets, or An asset that is not consumed or sold during the normal course of business, such as land, buildings, equipment, machinery, vehicles, leasehold improvements, and other such items.

Fair and Remunerative Price: Fair and Remunerative Price means the price of sugarcane determined by the Central Government and earlier it was called Statutory Minimum Price(SMP). It is changed as Fair and Remunerative Price since 2008.

Khandsari Sugar: It means sugar produced by open pan process.

Leverage Effect: The leverage effect refers to the generally negative correlation between an asset return and its changes of volatility.

Molasses: Molasses is a dark brown viscous liquid obtained by centrifuging the massecuite as by-product of sugar while processing sugarcane into sugar. It contains nearly 45 per cent uncrystallized, fermentable sugar and some sucrose and the sugar loss is 1.37 per cent.

Massecuite: The heavy molasses obtained from the 1st grade of massecuite are classified according to decreasing purity as A, B, C etc.

Net profits: It is the actual profits earned by a business entity after deducting all the expenses from sales realizations.

Net Working Capital: Net working capital, is defined as difference between Current Assets and Current Liabilities. Current assets include stocks, debtors, cash & equivalents and other current assets. Current liabilities include all the short-term borrowings.

Opening Stock of Sugar: Stock of an item at the beginning of a new inventory-keeping period and ending sugar season year is the beginning of new sugar inventory.

Owned Funds: Owned Fund' means aggregate of the paid-up equity capital and free reserves as disclosed in the latest balance sheet of the factory after deducting there from accumulated balance of loss, deferred revenue expenditure and other intangible assets.

Pre-Paid Expenses: Pre-paid expenses are the expenses of future period paid in advance.

Ex: Tax paid in advance, salary paid in advance

Prime Cost: This is the cost given to direct cane (means raw material or cane cost) in terms of the materials and labour involved in its production, excluding fixed costs. This cost is given by the factory it is always more than Fair and Remunerative Price of the Government.

Purchase Cost: It is charged at the rate of two per cent of the value of raw materials procured.

Press Mud or Filter Cake: Press mud is obtained in sugar factories to a tune of 2% of the weight of sugarcane crushed. About 5.2 million tonnes of press mud is produced in our country every year. Press mud contains sizable quantity of macro and micro nutrients, besides 20-25% of organic carbon. Press mud is used as manure by sugarcane farmers and the sugar loss is 0.07%.

Purchase Tax on Cane: (British) A tax levied on non-essential consumer goods and added to selling prices by retailers. OR

It is tax given by the factory to the State Government.

Pre-Seasonal: Ideal planting time is October-November. Apply manure and plough the field during June and prepare 2ft wide furrows.

Range of Minimum Cane Price: The lowest and highest prices that a given reaches over a specified period, usually the previous 52 weeks.

Recovery per cent : The per cent sugar or sucrose recovered from the raw material sugarcane.

Refractrometer Brix: The per cent by weight of solids in solution as indicated by the sugar refractometer or as derived from the refractive index and references to tables of equivalent per cent sucrose and refractive indices.

Reserve Funds: A reserve fund is the money ear-marked or kept apart for attaining specific goals in future as and when it occurs so that the event can be met without difficulty. For example, housing cooperatives society maintains reserve fund for repairs, corporation maintains reserve fund for debenture redemption etc so that when it is actually required to do it can be done without affecting the normal operations.

Share Capital: In case of owners of the firm are called share holders or stock holders. Therefore, owner's equity in case of companies is referred as shareholder equity or shareholders funds or capital or simply share capital.

Sugar Loss: The loss of sugar in bagasse, molasses, filter cake, undetermined during the processing of sugar is called as the sugar loss.

Sugar Year or Sugar Season: It means the year commencing on the first day of October and ending with the thirtieth day of September in the year next following.

Sugar per cent in cane: Recovery of sugar in sugarcane plus and sugar loss in total by products.

Sugar Inventory: It means sugar stock in the sugar factory. Sugar Inventories are the summation of various forms in which inventories existing a manufacturing factory are raw-materials, work-in-process and finished goods.

Suru Sugarcane: Ideal planting time is January- February. Apply manure and plough the field during June and prepare 2ft wide furrows.

Total Liabilities: It is computed as the summation of current and non-current liabilities.

Total Sale: It includes sale of sugar and sale of by-products.

Total Assets: It is computed as the summation of current assets and fixed assets or the sum of current and long-term assets owned by a person, company, or other entity.

Turnover Tax: A turnover tax is similar to a sales tax or a VAT, with the difference that it taxes intermediate and possibly capital goods. It is an indirect tax, typically on an ad valorem basis, applicable to a production process or stage.

Sugar manufacturing process

Step-I. Sugarcane harvested in fields is brought to factory weighed and fed to cane carrier and cut into pieces in leveler and cutter. The cut pieces of cane are crushed in the mills and juice is extracted leaving behind bagasse the first by product in sugar factory.

Step-II: Bagasse is utilized as full in the boilers. Stream produced in the boiler is utilized through the manufacturing process such as generating electricity in turbines, rotating mill turbines heating and evaporating juice in heater and evaporators, boiling the massecuites in the pans and washing the sugar crystals in centrifugal machines.

Step-III: Treatment of juice:

Raw juice extracted out of cane in the mill is weighed and treated with phosphate solution, phosphate solution bleaches the juice and helps information of flow of non sugar along with lime salts phosphated juice is heated upto 70 Degree Celsius in juice heaters.

Step-IV: Further, juice is treated with lime solution and SO2 gas in the vessel called sulphitor simultaneously lime precipitates at all the ingredients (non sugars) present in the juice except the sucrose and SO2 gas bleaches colouring matters present in the juice. Hence, raw juice is input and sulphited juice is output of sulphitor.

Sugar Manufacturing Process:

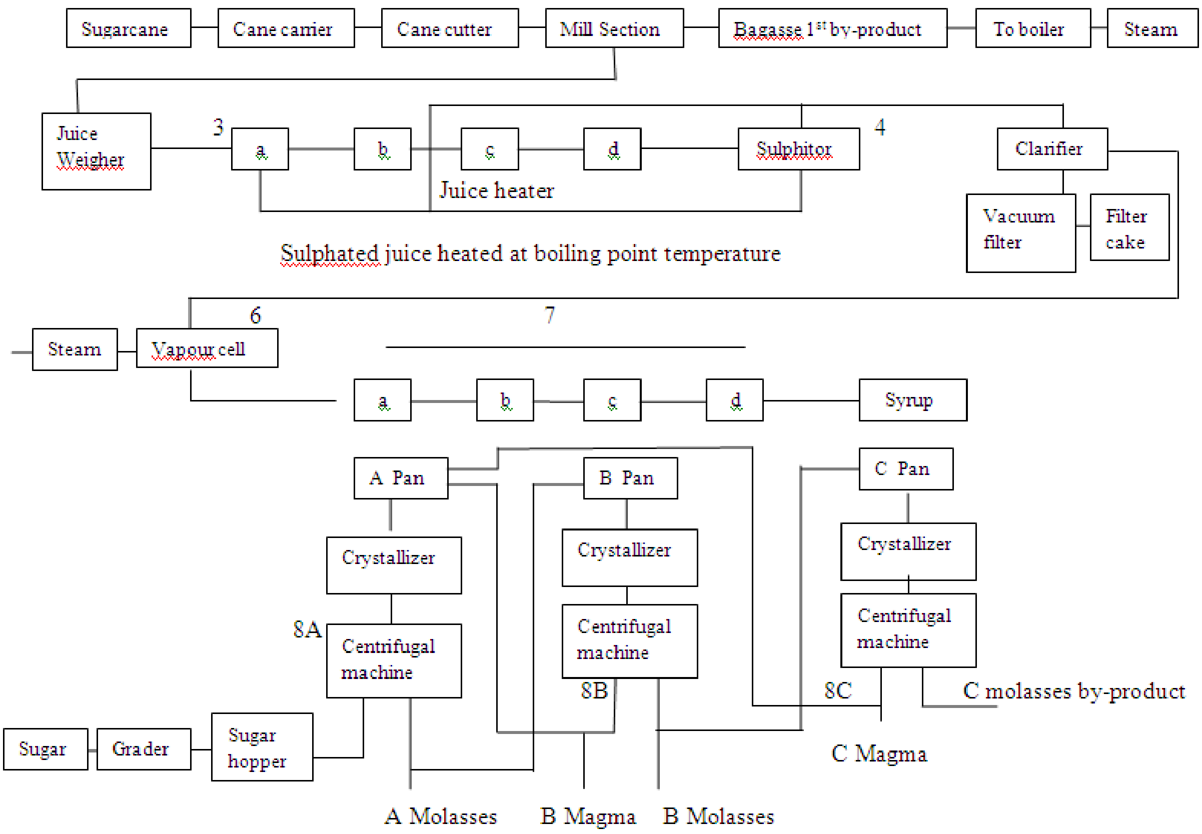


Fig 5. Sugar Manufacturing Process

Step-V: Sulphited juice is heated at its boiling point juice heater and allowed to settle down at clarified mud particles settle down at the bottom of the clarified clear juice suspended over the layers of mud bed is decanted out of clarifier to vapour cell and evaporated settled mud slurry in clarifieries taken to vacuum filter for filtration. Hence, treated as sulphited juice is the input, clarified juice and settled much slurry is the output of the clarifier.

Step-VI: Mud slurry is withdrawn from clarifier and filtered through vacuum filter press mud and filter cake obtained from vacuum filter is the second by product of sugar industry. This is sold to farmers of the factory as manure.

Step-VII: Clarified juice is pumped out of the clarifier and heated in vapour cell and evaporated in evaporators. Vapour cell produces the vapour on heating the clarified juice by steam and there vapours are utilized in boiling different types of sugar slurries in pan section. Thick liquid of the clarified juice called syrup (60 Degree Brix) is obtained on evaporation of water portion of clarified juice in the evaporators. Hence, clarified juice (16 Degree Brix) is the input and syrup (60 Degree Brix) is the output of the evaporator.

Step-VIII a : Boiling of sugar:

Syrup is gained in vacuum pan on boiling:

VIII-I 'A' Boiling:

On the footing of the above gains syrups is fed and boiled to its crystallization point in the pan (A pan 'A' massecuite, mixtures of sugar crystals and mother liquor) is produced and dropped in the crystallizer for cooling purpose. Hence, in 'A' pan boiling syrup is the input and 'A' massecuite is the output.

VIII-A: 'A' massecuite from crystallizer is purged in centrifugal machines; centrifugal machine separates out the sugar crystals from mother liquor (A molasses). Sugar obtained on purging 'A' massecuite is taken to sugar hoppers dried in the hoppers and graded, bagged, weighed to 100kg net stitched and sent to godowns. This is the main product. Hence, in 'A' centrifugal machines, A-massecuite is the input, sugar (main product and 'A' molasses are the output products.)

VIII-(a): 'B' Boiling:

Above 'A' molasses input is boiled to crystallization point in 'B'- pans and B- massecuite is produced (output). B massecuite is dropped in crystallizer, cooled and purged in B-centrifugal machines; get 'B' sugar and 'B'- molasses

VIII-11 B: B-sugar is mixed with syrup and taken up for A-boiling.

VIII-111: 'C' Boiling:

Above B-molasses (inputs) is boiling in C- pans to its crystallization point and C-massecuite is produced (output) dropped in the crystallizer cooled and purged in C- centrifugal machines.

VIII –C: 'C' sugar and C-molasses (final molasses) C-sugar is mixed with syrup and taken up for 'A' boiling C-molasses (final molasses) is weighed, and stored in steel tanks. This is the third by product in sugar industry. It is utilized as raw material in distillery and manufacturing of cattle feed.

RESULTS

The data from primary and secondary sources were analysed and the results are interpreted for drawing meaningful conclusions. The findings are presented under the following heads.

4.1 Investment pattern of the Malaprabha Cooperative Sugar Factory Ltd.

4.2 Procurement Management and Processing activities

4.3 Physical and financial performance of the factory

4.4 Marketing Management and its by-products

4.5 Problems faced by the factory management

4.1 Investment pattern of the Malaprabha Cooperative Sugar Factory Ltd.

4.1.1 Investment pattern in Sugar Factory

The investment pattern in the Malaprabha Cooperative Sugar Factory Ltd was presented in Table 4.1.

From the Table 4.1, it could be seen that the total investment was ₹6,692.64 lakhs. The investment on machinery and equipments was the highest followed by infrastructure, land, other works, civil structures, buildings and furniture and fixtures. The proportion of investment on land in the total investment was 12.67percent .Similarly, the proportion of fixed capital invested on buildings was 5.18 percent. The proportion of investment on machinery and equipments was 43.69 percent. The proportion of infrastructures investment was 19.61 percent. The proportion of investment on civil structures, furniture and fixtures and other works were 6.73percent, 2.95percent and 9.17percent respectively.

4.1.2 Financial feasibility of Sugar Factory

Table 4.2 presented the cash flows in sugar factory. As it could be seen from the Table, cash inflows and cash outflows varied widely over years during the entire period of sugar processing unit. The highest projected cash flows would be in 2030-31(₹1055.40 lakhs) and lowest was in 1997-98 (₹-225.45 lakhs). The Net Present Value of the factory would ₹ 886.94, and the net present value of the factory from 2012-13 to 2031-32 would be the projected values.

Table 4.3 showed three discounting measures of financial feasibility, namely, Net Present Value(NPV), Benefit Cost Ratio(BCR) and Internal Rate of Return(IRR) in addition to Payback period for entire life of the sugar factory. The Net Present Value of all the cash flows during the entire life of period of the sugar factory was ₹ 1338.47 lakhs. This showed that the sugar factory was financially highly feasible.

Benefit Cost ratio was worked out to be 3.93. This implied that, for every one rupee invested in sugar factory, there would be net returns of.₹3.93 in present value terms. The Internal Rate of Return for sugar factory happened to be very high at 31.00 per cent. Since, these values of Internal Rate of Return were considerably higher than the prevailing rate of interest, 20 per cent would be highly financially feasible.

The results pertaining to Payback Period were in line with the estimated values of NPV, B-C Ratio and IRR. While the Payback Period happened to be 2.54 years for sugar factory. This implied that the initial investment made in sugar factory would be completely paid off in around 2 and 1/2years.

4.2 Procurement Management and Processing activities

4.2.1 Varietal Management in the area of operation of Malaprabha Cooperative Sugar Factory Ltd.

Varietal management in the area of operation of the Malaprabha Cooperative Sugar Factory Ltd over the study years is presented in Table 4.4. The factory had maintained both early maturing and late maturing varieties.

Table 4.1: Investment Pattern of Malaprabha Cooperative Sugar Factory Ltd

Sl. No	Particulars		Amount (₹ in lakhs)	Percentage (%)
1	Land		848.22	12.67
2	Buildings		346.96	5.18
3	Machinery & Equipments			
	a)General Machines	370.96		
	b) Workshop Machinery	132.52		
	c) Furnish oil tank	594.68		
	d)Engineering Equipments	464.44		
	e)Laboratory Equipments	549.93		
	f) Medical Equipments	811.18	2923.71	43.69
4	Infrastructure			
	a) Truck, Tractor, Motorcycles	426.20		
	b) Bullock carts	302.99		
	c) Bulldozer	230.50		
	d) Tempos	353.00	1312.69	19.61
5	Civil structures		450.20	6.73
6	Furniture's and Fixtures		197.29	2.95
7	Other works		613.57	9.17
	Total		6692.64	100

Source: Records maintained by the Account Section in Rani Sugar (Malaprabha Cooperative Sugar Factory Ltd)

Table 4.2: Cash flows in Malaprabha Cooperative Sugar Factory Ltd (1971-72 to 2031-32)

(₹ in lakhs)

Years	Cash inflow	Cash outflow	Net cash flows	Net discounted cash flows
1971-72	--	225.45	-225.45	-225.45
1972-73	365.25	265.85	99.40	91.19
1973-74	389.98	295.84	94.14	79.78
1974-75	412.50	310.25	102.25	79.26
1975-76	425.35	356.25	69.10	49.00
1976-77	468.65	398.56	70.09	45.81
1977-78	510.50	408.20	102.30	61.26
1978-79	525.35	425.56	99.79	54.83
1979-80	595.45	432.58	162.87	81.84
1980-81	610.25	468.95	141.30	65.12
1981-82	635.45	510.22	125.23	53.06
1982-83	685.24	525.35	159.89	61.97
1983-84	695.75	565.95	129.80	46.19
1984-85	705.20	598.36	106.84	34.92
1985-86	725.60	620.35	105.25	31.51
1986-87	740.80	685.25	55.55	15.26
1987-88	785.62	700.25	85.37	21.50
1988-89	795.85	725.35	70.50	16.32
1989-90	802.26	765.28	36.98	7.85
1990-91	821.25	795.85	25.40	4.94
1991-92	846.65	814.50	32.15	5.74
1992-93	895.65	835.62	60.03	9.84
1993-94	900.05	885.25	14.80	2.23
1994-95	908.25	865.35	42.90	5.92
1995-96	915.62	897.25	18.37	2.32

1996-97	945.55	900.52	45.03	5.22
1997-98	982.56	945.62	36.94	3.93
1998-99	895.65	785.62	110.03	10.75
1999-00	1025.25	985.62	39.63	3.55
2000-01	1045.65	965.32	80.33	6.60
2001-02	1095.41	988.25	107.16	8.08
2002-03	1077.01	844.48	232.53	16.08
2003-04	1042.92	769.30	273.62	17.36
2004-05	950.25	852.40	97.85	5.49
2005-06	1022.25	952.45	69.80	3.73
2006-07	950.85	875.25	75.60	3.70
2007-08	1012.25	765.45	246.80	11.09
2008-09	985.25	659.23	326.02	13.44
2009-10	925.53	786.55	138.98	5.26
2010-11	1055.32	912.99	142.33	4.94
2011-12	1025.65	950.45	75.20	2.40
2012-13	1058.25	985.25	73.00	2.13
2013-14	1125.35	1023.25	102.10	2.74
2014-15	1145.02	1102.05	42.97	1.06
2015-16	1250.35	1098.52	151.83	3.43
2016-17	1325.52	1156.35	169.17	3.50
2017-18	1456.35	1256.32	200.03	3.80
2018-19	1560.23	1356.25	203.98	3.55
2019-20	1598.60	1398.65	199.95	3.20
2020-21	1623.52	1423.53	199.99	2.93
2021-22	1695.52	1498.25	197.27	2.65
2022-23	1735.35	1564.35	171.00	2.11
2023-24	1798.55	1568.55	230.00	2.60

2024-25	1855.45	1632.52	222.93	2.31
2025-26	1925.45	1658.95	266.50	2.54
2026-27	2025.31	1745.56	279.75	2.45
2027-28	2058.52	1795.88	262.64	2.10
2028-29	2235.62	1820.52	415.10	3.05
2029-30	2560.52	1855.65	704.87	4.76
2030-31	2980.65	1925.25	1055.40	6.54
2031-32	3005.85	2015.25	990.60	5.63
Total				886.94

Table 4.3: Financial feasibility of Investment in Malaprabha Cooperative Sugar Factory Ltd

Sl.No	Particulars	Value
1	Net Present Value (lakh rupees)	1338.47
2	Benefit Cost Ratio	3.93
3	Internal Rate of Return (%)	31.00
4	Payback Period(years)	2.54

Table 4.4: Varietal Management in the area of operation of Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(000 ha)

Years	Early Maturity	Late Maturity	Total
1997-98	3.25 (20.54)	12.57 (79.46)	15.82 (100.00)
1998-99	3.55 (21.52)	12.95 (78.48)	16.50 (100.00)
1999-00	3.85 (22.52)	13.25 (77.48)	17.10 (100.00)
2000-01	4.00 (22.80)	13.54 (77.20)	17.54 (100.00)
2001-02	4.15 (23.06)	13.85 (76.94)	18.00 (100.00)
2002-03	4.65 (24.67)	14.20 (75.33)	18.85 (100.00)
2003-04	4.95 (25.52)	14.45 (74.48)	19.40 (100.00)
2004-05	5.25 (26.12)	14.85 (73.88)	20.10 (100.00)
2005-06	5.45 (26.65)	15.00 (73.35)	20.45 (100.00)
2006-07	5.85 (27.82)	15.18 (72.18)	21.03 (100.00)
2007-08	6.00 (28.10)	15.35 (71.90)	21.35 (100.00)
2008-09	6.15 (28.21)	15.65 (71.79)	21.80 (100.00)
2009-10	6.35 (28.48)	15.95 (71.52)	22.30 (100.00)
2010-11	6.65 (29.17)	16.15 (70.83)	22.80 (100.00)
2011-12	6.95 (29.92)	16.28 (70.08)	23.23 (100.00)
Average	5.14 (26.03)	14.61 (73.97)	19.75 (100.00)

Early Maturing Varieties: COC-671, CO-6032, CO-9500
Late Maturing Varieties: CO-7219, CO-740, CO-8014, CO-8011
Source: Records maintained by the Agriculture Section of Rani Sugar

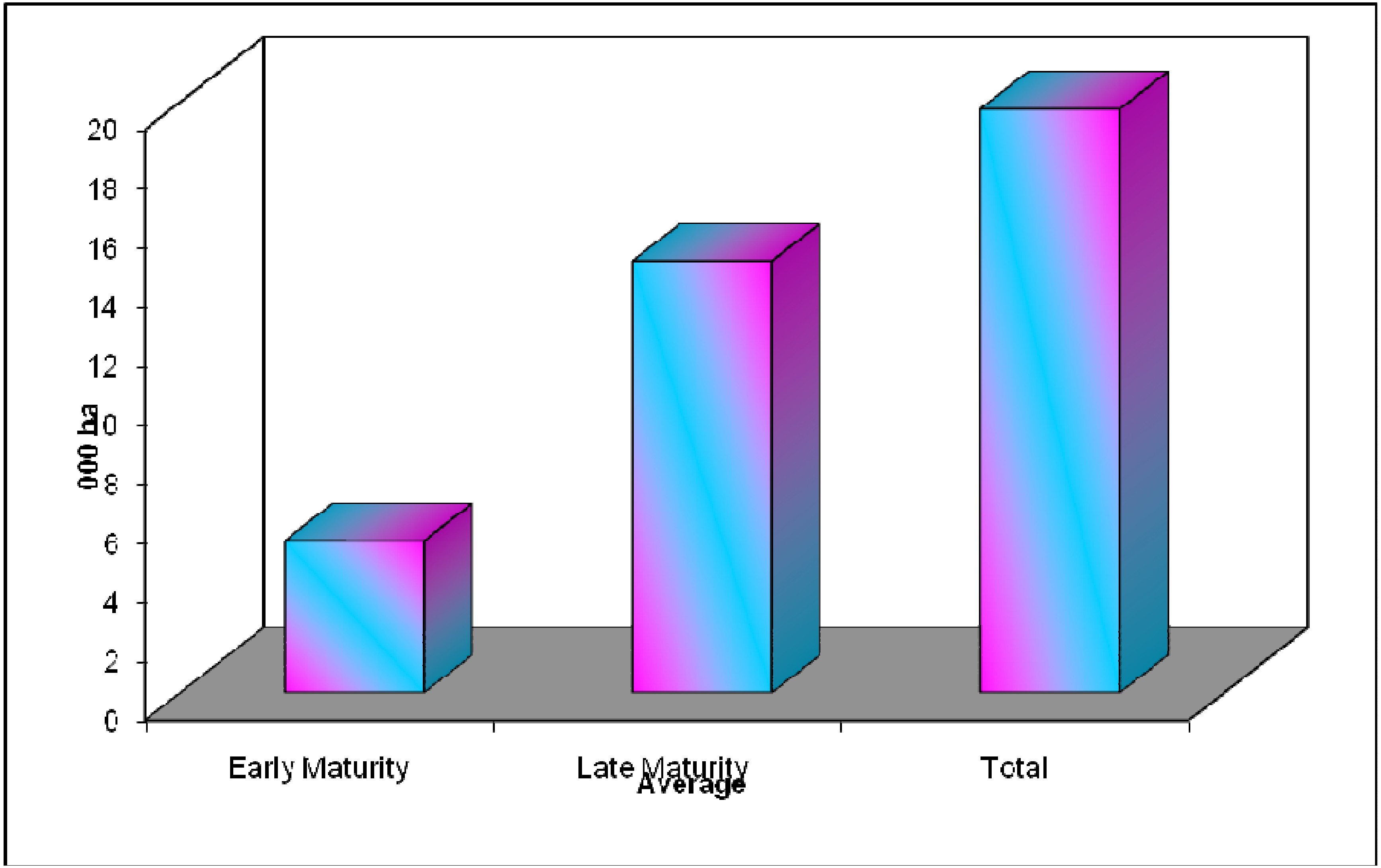


Fig 6. Varietal Management in the area of operation of Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

The proportion of sugarcane area under early maturing varieties to total sugarcane area increased from 20.54 percent in 1997-98 to 29.92 percent in 2011-12 with an average area of 26.03 percent over the study period.

The proportion of sugarcane area under late maturing varieties to total sugarcane area was 79.46 percent in 1997-98 decreased to 70.08 percent in 2011-12. The average area of late maturing varieties was 73.97 percent over the study period.

Total of the early and late maturity varieties were highest in 2011-12 (23.23 thousand hectare) and lowest in 1997-98 (15.82 thousand hectare) with an average of 19.75 thousand hectare.

4.2.2 Month-wise planting and harvesting schedule of Malaprabha Cooperative Sugar Factory Ltd

The month-wise planting schedule in the area of operation is presented in Table 4.5. The month-wise plantation of sugarcane area should be 33.33 percent and ratoon area should be 66.67 percent of sugarcane area.

The sugarcane area planted in the months of October, November, December, January, February and March was 1273, 3748, 3559, 2216, 1057 and 499 hectares constituting 97.40, 57.08, 41.31, 31.95, 20.71 and 11.30 percent to the total sugarcane area respectively.

The sugarcane area under ratoon in the months of October, November, December, January, February and March was 34, 2818, 5057, 4719, 4046 and 3917 hectares forming 2.60, 42.92, 58.69, 68.05, 79.29 and 88.70 percent to total sugarcane area in the respective months.

The month-wise harvesting schedule of sugarcane in the area of operation is also presented in this Table. Fifty percent of planted sugarcane area in the month of October was harvested and entire ratoon area of October was harvested in subsequent year of October. In November, 50 percent of planted area of October and entire ratoon area was harvested. In December, entire planted area of November and entire area of ratoon area of December was harvested. In January, entire planted area of December and entire ratoon area of January and 30 percent of planted area of January was harvested. In February, entire ratoon area of February, 70 percent each of the planted area of January and February respectively were harvested. In March, 30 percent of planted area of February, entire ratoon and planted area of March, was harvested.

4.2.3 Modes of transportation and their contribution in Malaprabha Cooperative Sugar Factory Ltd.

Modes of transportation and their contribution were presented in Table 4.6. The usual modes of transportation used by the factory in procurement of sugarcane were tractors, trucks and Bullock carts. Sugarcane transportation through tractor was a most common feature in the study area. This mode accounted for about 39.06 percent of cane transported. Transportation through bullock carts accounted for about 25.02 percent. The composition of share by different modes remained same over the years. Transportation through trucks were found to account for about 35.92 percent of the total cane transported.

The proportion to cane transported to the total cane procured by tractor was highest in 1998-99 (45.04%) and lowest in 2005-06 (32.96%). The proportion of cane transported by truck to the total sugarcane procured was highest in 2005-06 (40.78%) and lowest in 2011-12 (33.48%). The proportion of cane transported by cart to total sugarcane procured varied between 19.67 percent in 1997-98 and 28.77 percent in 2008-09.

The total of the transportation and their contribution was highest in 2011-12 (11.50 lakh tonnes) and lowest in 1997-98 (6.10 lakh tonnes), with an average of 8.91 lakh tonnes.

4.2.4 Sugarcane Area, Production, Cane Procurement and Capacity Utilization in the Malaprabha Cooperative Sugar Factory Ltd.

It is important for every sugar factory to know the sugarcane area, production, cane procured and capacity utilization from different zones in the area of operation. Therefore, detailed analysis of area, production, cane procured and capacity utilization were worked out was presented in Table 4.7.

There was varying trend of sugarcane area over the study period from the factory area of operation. The area under sugarcane was highest in 2011-12 (11,28,782 hectares) and the lowest was in 2000-01 (3,38,121 hectares). The average sugarcane area was 8, 10,460 hectares.

Table 4.5: Month-wise planting and harvesting schedule of Malaprabha Cooperative Sugar Factory Ltd

Months	Planting Schedule		Programme of operating Planting Schedule		Total(ha)	Harvesting Schedule
	Planting (%)	Ratoon (%)	Planting (%)	Ratoon (%)		
October	33.33	66.67	1273 (97.40)	34 (2.60)	1307 (100.00)	Rt of October + Pl of October (50%)
November	33.33	66.67	3748 (57.08)	2818 (42.92)	6566 (100.00)	Pl of October (50%) + Rt of November
December	33.33	66.67	3559 (41.31)	5057 (58.69)	8616 (100.00)	Pl of November + Rt of December
January	33.33	66.67	2216 (31.95)	4719 (68.05)	6935 (100.00)	Pl of December + Rt of January + Pl of January (30%)
February	33.33	66.67	1057 (20.71)	4046 (79.29)	5103 (100.00)	Rt of February + Pl of January (70%) + Pl of February (70%)
March	33.33	66.67	499 (11.30)	3917 (88.70)	4416 (100.00)	Pl of February (30%) + Rt of March + Pl of March

Source: Records maintained by the Agriculture Section, Pl: Planting, Rt: Ratoon

Table 4.6: Modes of transportation and their contribution in Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(Lakh tonnes)

Years	Cart	Trucks	Tractor	Total
1997-98	1.20 (19.67)	2.25 (36.89)	2.65 (43.44)	6.10 (100.00)
1998-99	1.25 (19.08)	2.35 (35.88)	2.95 (45.04)	6.55 (100.00)
1999-00	1.45 (20.71)	2.45 (35.00)	3.10 (44.29)	7.00 (100.00)
2000-01	1.55 (20.39)	2.65 (34.87)	3.40 (44.74)	7.60 (100.00)
2001-02	1.85 (24.50)	2.85 (37.75)	2.85 (37.75)	7.55 (100.00)
2002-03	1.95 (22.68)	3.00 (34.88)	3.65 (42.44)	8.60 (100.00)
2003-04	2.00 (22.22)	3.25 (36.11)	3.75 (41.67)	9.00 (100.00)
2004-05	2.20 (22.82)	3.45 (35.79)	3.99 (41.39)	9.64 (100.00)
2005-06	2.35 (26.26)	3.65 (40.78)	2.95 (32.96)	8.95 (100.00)
2006-07	2.55 (28.27)	3.22 (35.70)	3.25 (36.03)	9.02 (100.00)
2007-08	2.75 (27.78)	3.50 (35.35)	3.65 (36.87)	9.90 (100.00)
2008-09	2.92 (28.77)	3.78 (37.24)	3.45 (33.99)	10.15 (100.00)
2009-10	3.00 (27.78)	3.85 (35.65)	3.95 (36.57)	10.80 (100.00)
2010-11	3.15 (27.95)	3.92 (34.78)	4.20 (37.27)	11.27 (100.00)
2011-12	3.25 (28.26)	3.85 (33.48)	4.40 (38.26)	11.50 (100.00)
Average	2.23 (25.02)	3.20 (35.92)	3.48 (39.06)	8.91 (100.00)

Source: Records maintained by Agriculture Section

Note: Figures in the parentheses indicate percentage to the total

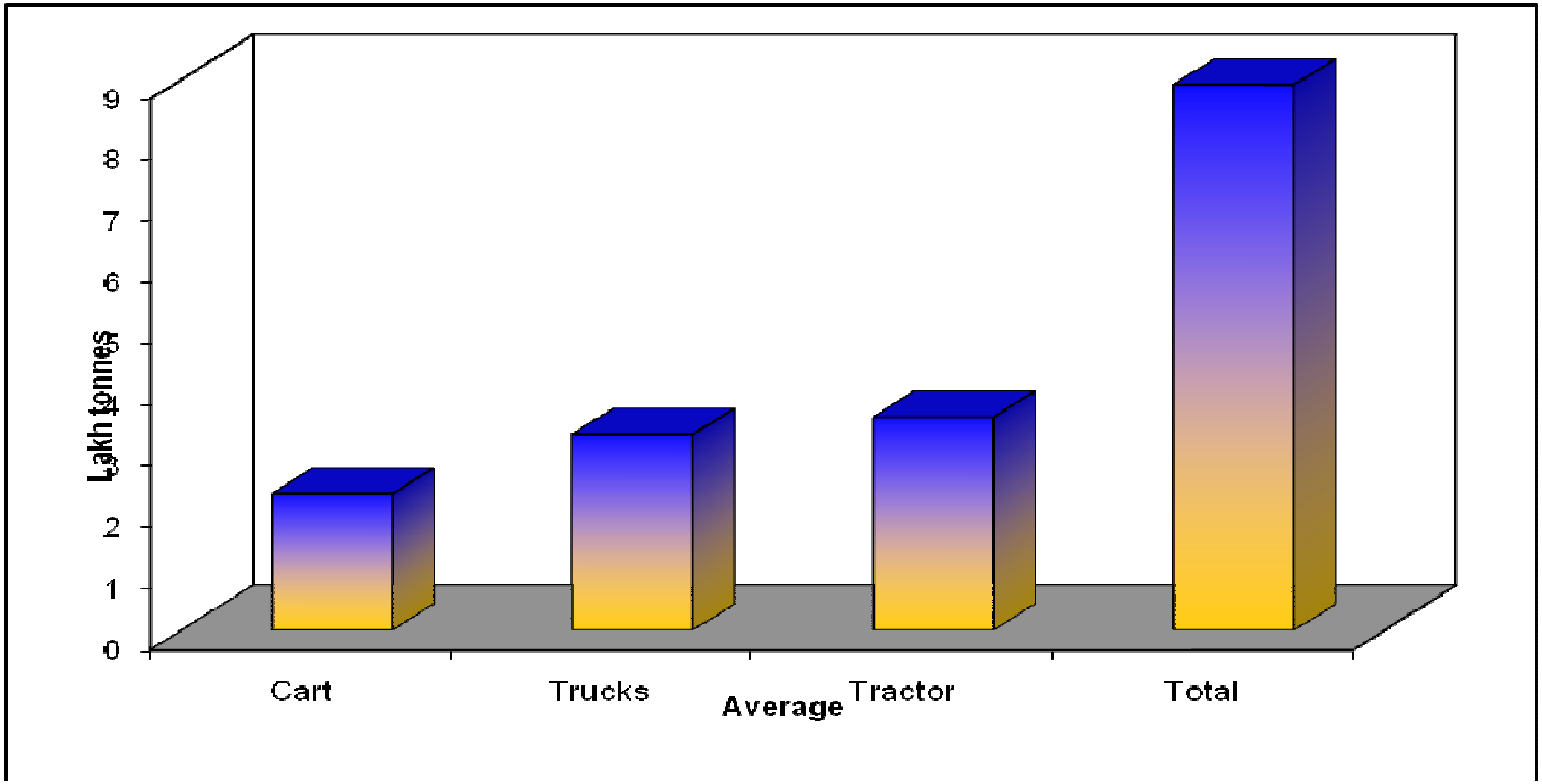


Fig 7. Modes of transportation and their contribution in Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

Table 4.7: Sugarcane Area, Production, Cane Procurement and Capacity Utilization in the Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(MT)

Years	Area (ha)	Requirement for the season (MT)	Sugarcane Production from the area of operation (MT)	Cane procurement	Proportion of cane procured to the production (in %)	Proportion of cane procured to the requirement for the season (in %)	Total deduction from procurement (MT)	Net sugarcane quantity available for crushing	Percentage of deduction from cane procurement	Total hrs.of crushing	Crushing days (Average days)	Capacity Utilization (%)
1997-98	9,80,044	7,42,250	4,86,060	7,15,125	147.13	96.35	210.80	714914.20	0.03	4,538	206	97.34
1998-99	7,08,025	6,51,215	8,34,620	5,94,250	71.20	91.25	245.60	594004.40	0.04	3,699	168	80.86
1999-00	9,01,256	5,81,150	6,40,360	5,65,135	88.25	97.24	450.50	564684.50	0.08	3,447	156	77.54
2000-01	3,38,121	7,82,580	6,61,180	7,51,285	113.63	96.00	4.35	751280.70	5.79	4,685	212	102.20
2001-02	9,70,502	8,92,256	4,41,200	8,59,135	194.73	96.29	725.50	858409.50	0.08	5,087	231	111.72
2002-03	5,08,456	8,50,263	5,65,015	8,25,165	146.04	97.05	1867.70	823297.30	0.23	3,213	135	68.21
2003-04	6,28,032	7,42,456	2,51,875	7,15,250	283.97	96.34	787.10	714462.90	0.11	1,673	071	33.29
2004-05	7,01,452	8,25,854	1,10,220	8,00,286	726.08	96.90	5.34	800280.70	6.67	1,383	058	13.73
2005-06	4,25,326	6,00,365	4,10,355	5,15,542	125.64	85.87	975.10	514566.90	0.19	2,327	134	50.30
2006-07	8,08,215	6,25,145	6,83,015	5,25,165	76.89	84.00	6342.20	518822.80	1.21	4,908	205	84.60
2007-08	9,08,235	8,25,250	6,13,850	8,15,265	132.81	98.79	9822.60	805442.40	1.21	4,306	181	75.85
2008-09	10,01,246	8,50,123	2,85,475	8,25,125	289.04	97.06	211.70	824913.30	0.03	2,134	090	28.26
2009-10	10,48,012	9,10,420	3,82,180	9,00,120	235.52	98.87	283.70	899836.30	0.03	1,855	123	51.12
2010-11	11,01,203	9,25,315	5,45,740	9,15,250	167.71	98.91	13452.80	901797.20	1.47	3,508	161	68.55
2011-12	11,28,782	9,50,125	4,70,810	9,25,258	196.53	97.38	3306.90	921951.10	0.36	2,856	127	54.96
Average	8,10,460	7,83,651	4,92,130	7,49,824	199.68	95.22	2579.45	747244.30	1.17	3,308	151	66.57

Source: Records maintained by the Agriculture Section, Cane Account Section and Cane Development Office (CDO)   MT: Metric tonne

On an average factory required 7,83,651 metric tonnes of sugarcane every year. This requirement varied between 9,50,125 metric tonnes in 2011-12 and lowest was 5,81,150 metric tonnes in 1999-00.

The production of sugarcane was varying trend over the study period. The sugarcane production was highest in 1998-99 (8,34,620 metric tonnes) and the lowest in 2004-05(1,10,220 metric tonnes). The average sugarcane production was 4, 92,130 metric tonnes.

The procurement of sugarcane also varied over the study period. The procurement of sugarcane was highest in 2011-12 (9,25,258 metric tonnes) and lowest was in 2005-06 (5,15,542 metric tonnes). The average procurement of sugarcane was 7, 49,824 metric tonnes.

The proportion of sugarcane procured in the total production averaged to 199.68 percent. It was found that the factory had procured about 95.22 percent of its requirement.

The deduction made in the factory was highest in 2004-05 (6.67%) and lowest in 1997-98 (0.03 %), with an average weight deduction of 1.17 per cent over the study period.

The total number of hours worked by factory was examined and it was maximum in 2001-02 (5087hours) and minimum in 2004-05 (1383 hours). The average total number of hours of crushing was 3308 hours over the study period.

The average number of crushing days was 151.It was maximum in 2001-02(231 days) and minimum in 2004-05(58 days). Total hours of crushing were spread over in three shifts per day. The daily crushing capacity of the factory was 3500 tonnes per day.

The capacity utilization by Rani Sugar showed varying trend over the study period. It was highest in 2001-02(111.72%) and lowest in 2004-05 (13.73%). Average capacity utilization was 66.57 percent over the study period.

4.2.5 Fair and Remunerative Price (FRP) of sugarcane v/s price paid by Malaprabha Cooperative Sugar Factory Ltd

The Government of India on the recommendation of the Commission for Agricultural Costs and Prices (CACP) fixed the Fair and Remunerative Sugarcane Price to be paid to the cultivators in each factory area under the provision of clause 3 of the Sugar Control Order, 1966 to assure Fair and Remunerative Price for the sugarcane cultivators. The Fair and Remunerative Price of sugarcane showed an increasing trend. It was ₹652.50 per tonne in 1997-98 and increased to ₹1450 per tonne in 2011-12, recovery of 11.60 percent over the study period and the average Fair and Remunerative Price was ₹ 964.44 with an average recovery of 10.50 over the study period with linked to basic recovery of 8.5 percent.

The premium on every 1% increase in recovery over 8.5% was highest in 6.85 percent in 2011-12 and lowest in 2.60 percent in 1997-98 with an average of 4.49 percent.

Range of minimum cane price on basic recovery was also showed an increasing trend. The range increased from ₹20 per tonne in 1997-98 to ₹240 per tonne 2009-10 and again it was decreased to ₹190 in 2011-12. The average minimum cane price was ₹76.93 per tonne.

The per tonne cane bill paid by factory fluctuated over the study period. It was increased from₹ 900 per tonne in 1997-98 to ₹2000 per tonne in 2009-10. However, it decreased to ₹1800 per tonne in 2011-12.

The percentage increased over the FRP was highest in 2011-12 (13.10%) and lowest in 2001-02 (2.51%). The average percentage was 7.07 percent.

4.2.6 Mode of payment of Sugarcane bill to Cane Suppliers

Mode of payment of sugarcane bill to cane suppliers has been presented in Table 4.9. The payment of sugarcane bill has been made in three installments.

The proportion of first installment to total cane bill showed a varying trend over the study period. It was the highest in 2001-02 (82.42%) and lowest in 2000-01 (70.00%). On an average, 77.06 percent of total cane bill was paid in first installment. The proportion of second installment to total cane bill was highest in 2007-08 (22.22%) and lowest in 2001-02 (13.33%) with an average of 17.55 percent.

Table 4.8: Fair and Remunerative Price (FRP) of sugarcane and price paid by the Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(₹Per tonne)

Years	Fair and Remunerative Price(FRP)	Recovery Percentage	Linked to basic recovery	Premium on every 1% increase in recovery over 8.5%	Range of Minimum Cane Price	Total Cane bill paid by the factory	Percentage increase over the FRP
1997-98	652.50	11.07	8.5	2.60	20	900.00	3.07
1998-99	700.60	10.61	8.5	2.80	20	800.00	2.86
1999-00	752.40	10.64	8.5	3.00	20	785.00	2.66
2000-01	770.00	10.54	8.5	3.12	20	800.00	2.60
2001-02	795.70	10.43	8.5	3.50	20	825.00	2.51
2002-03	875.40	10.80	8.5	3.68	50	800.00	5.71
2003-04	968.00	9.84	8.5	4.12	50	800.00	5.17
2004-05	859.40	8.73	8.5	4.25	50	1000.00	5.82
2005-06	795.00	10.98	8.5	4.55	70	1200.00	8.81
2006-07	982.50	10.30	8.5	5.00	90	800.00	9.16
2007-08	928.80	10.80	8.5	5.32	90	900.00	9.69
2008-09	973.80	10.01	8.5	6.00	90	1400.00	9.24
2009-10	1366.90	10.87	8.5	6.15	204	2000.00	14.92
2010-11	1595.60	10.30	8.5	6.35	170	1800.00	10.65
2011-12	1450.00	11.60	8.5	6.85	190	1800.00	13.10
Average	964.44	10.50	8.5	4.49	76.93	1107.33	7.07

Source: Records maintained by the Cane Account Section of Rani Sugar

Table 4.9: Mode of payment of sugarcane bill to sugarcane suppliers of Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(₹Per tonne)

Years	I Installment	II Installment	III Installment	Total
1997-98	700.00 (77.78)	125.00 (13.89)	75.00 (8.33)	900.00 (100.00)
1998-99	580.00 (72.50)	140.00 (17.50)	80.00 (10.00)	800.00 (100.00)
1999-00	625.00 (79.62)	125.00 (15.92)	35.00 (4.46)	785.00 (100.00)
2000-01	560.00 (70.00)	160.00 (20.00)	80.00 (10.00)	800.00 (100.00)
2001-02	680.00 (82.42)	110.00 (13.33)	35.00 (4.24)	825.00 (100.00)
2002-03	630.00 (78.75)	135.00 (16.88)	35.00 (4.38)	800.00 (100.00)
2003-04	615.00 (76.88)	150.00 (18.75)	35.00 (4.38)	800.00 (100.00)
2004-05	790.00 (79.00)	170.00 (17.00)	40.00 (4.00)	1000.00 (100.00)
2005-06	950.00 (79.17)	180.00 (15.00)	70.00 (5.83)	1200.00 (100.00)
2006-07	600.00 (75.00)	140.00 (17.50)	60.00 (7.50)	800.00 (100.00)
2007-08	650.00 (72.22)	200.00 (22.22)	50.00 (5.56)	900.00 (100.00)
2008-09	1120.00 (80.00)	200.00 (14.29)	80.00 (5.71)	1400.00 (100.00)
2009-10	1500.00 (75.00)	380.00 (19.00)	120.00 (6.00)	2000.00 (100.00)
2010-11	1350.00 (75.00)	410.00 (22.78)	40.00 (2.22)	1800.00 (100.00)
2011-12	1450.00 (80.56)	290.00 (16.11)	60.00 (3.33)	1800.00 (100.00)
Average	853.33 (77.06)	194.33 (17.55)	59.67 (5.39)	1107.33 (100.00)

Source: Records maintained by the Cane Account Section of Rani Sugar
Note: Figures in the parentheses indicate percentage to the total

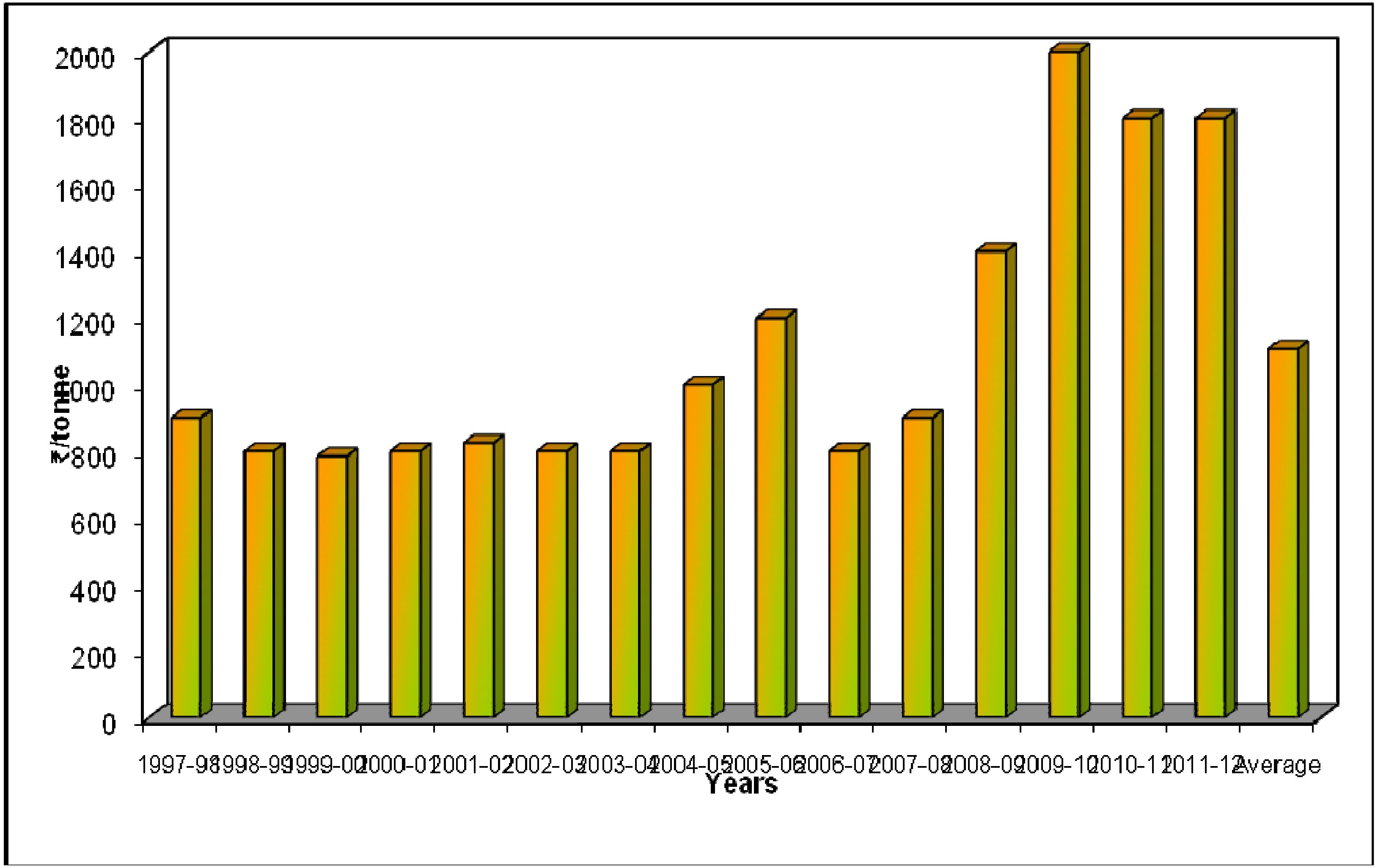


Fig 8. Mode of payment of sugarcane bill to sugarcane suppliers of Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

The proportion to third installment to total cane bill was highest in 1998-99 and 2000-01 (10.00%) and lowest in 2011-12 (3.33%), with an average of 5.39 percent over the study period.

The total of mode of payment of sugarcane bill to sugarcane suppliers was highest in 2009-10 (2000 per tonne) and lowest in 1999-2000 (785 per tonne), with an average of 1107.33 per tonne.

4.2.7 Sugarcane procurement cost of Malaprabha Cooperative Sugar Factory Ltd.

Sugarcane procurement cost over the years is presented in Table 4.10. There was a fluctuation in the procurement cost of sugarcane over the years. The prime cost of cane increased was highest in ₹1824.75 per tonne (83.06%) of sugarcane in 2009-10 and lowest in ₹423.11 per tonne (83.99%) of sugarcane in 1997-98.

Purchase tax on sugarcane increased from ₹33.84 per tonne (6.72%) of sugarcane in 1997-98 to ₹68.74 per tonne (5.01%) of sugarcane in 2004-05. However, it decreased to₹ 57.77 per tonne (2.79%) of sugarcane in 2011-12.Cess on cane purchase was levied from 2000-01 onwards. It increased from ₹7.25 per tonne (0.86%) of sugarcane in 2000-01 to ₹8.42 per tonne (1.09%) of sugarcane in 2001-02. However it decreased to ₹4.85 per tonne (0.23%) of sugarcane in 2011-12.

The cane harvesting charges were increased over the period of study. It increased from ₹14.05 per tonne (2.79%) of sugarcane in 1997-98 to ₹169.24 per tonne (8.11%) of sugarcane in 2010-11. However, it decreased to ₹159.88 per tonne (7.74%) of sugarcane in 2011-12.

Cane transportation charges varied from ₹23.70 per tonne (4.71%) of sugarcane in 1997-98 to ₹154.91 per tonne (7.50%) of sugarcane in 2011-12, with an average of ₹71.72 per tonne (6.00%).

Turnover tax on cane purchased was highest in ₹19.91 per tonne (2.36%) of sugarcane in 2000-01 and lowest in ₹ 5.74 per tonne (0.75%) of sugarcane in 2001-02, with an average of ₹ 9.63 per tonne (0.81%).

Cane purchase incentives and cane development cess were the other expenses in cane procurement. However, the highest cane purchase was levied from 1999-2000 onwards. The highest cane purchase incentive was ₹7.00 (0.34%) in 2011-12 and lowest was ₹ 0.68 (0.08%) in 2000-01, with an average of ₹ 4.47 (0.38%). The cane development cess was the highest in ₹4.23 (0.46%) in 1999-2000 and lowest in ₹0.05 (8.24%) in 1998-99, with an average of ₹2.05 (0.17%).

Total of all the cost was highest in 2009-10 (₹2196.83 per tonne of sugarcane) and lowest in 1997-98 (₹503.75 per tonne of sugarcane). The average of total cost was ₹1186.21 per tonne of sugarcane.

4.2.8 Main and By-products and Sugar losses in by-products of Malaprabha Co-operative Sugar Factory Ltd.

The average recovery percent of fiber, baggase, filter cake and molasses is presented in Table 4.11. The average recovery percent of sugar in cane, fiber, baggase, filter cake and molasses, showed varying trend over the study period.

The sugar percent in cane was highest in 2011-12 (14.95%) and was lowest in 2004-05 (10.95%). Average sugar percent in cane was 12.99 percent over the study period.

The average recovery percent of sugar was 10.50 over the study period. Recovery percent of sugar in cane was maximum in 2011-12 (11.60%) and minimum in 2004-05 (8.73%).

The average recovery percent of molasses was 4.17 over the study period. Recovery percent of sugar in cane was highest in 2007-08 (4.94%) and lowest in 1997-98 (3.00%).

The recovery percent of fiber was maximum in 2011-12 (19.50%) and minimum in 2002-03(17.00%). Average recovery percent of fiber was 18.04 percent over the study period.

The average recovery percent of baggase was 35.31 percent over the study period. The recovery percent of bagasse was maximum in 1997-98(40.19%) and minimum was in 2011-12(31.42%).

The recovery percent of filter cake was minimum in 1997-98 (3.71%) and after it was constant from 2002-03 to 2011-12 and it was (4.00%). Average recovery percent of filter cake was 3.97 percent over the study period.

Table 4.10: Sugarcane Procurement Cost of Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(₹. Per tonne of sugarcane)

Years	Prime cost of Cane	Purchase tax on Cane	Cess on Cane purchase	Cane harvesting charges	Cane transportation charges	Turnover tax on Cane purchase	Cane purchase incentives	Cane development cess	Total
1997-98	423.11 (83.99)	33.84 (6.72)	Nil (0.00)	14.05 (2.79)	23.70 (4.70)	7.40 (1.47)	Nil (0.00)	1.65 (0.33)	503.75 (100)
1998-99	508.85 (83.90)	35.96 (5.93)	Nil (0.00)	17.76 (2.93)	32.65 (5.38)	11.24 (1.85)	Nil (0.00)	0.05 (8.24)	606.51 (100)
1999-00	777.55 (84.83)	64.42 (7.02)	Nil (0.00)	17.49 (1.91)	30.20 (3.30)	19.51 (2.13)	3.19 (0.35)	4.23 (0.46)	916.59 (100)
2000-01	724.94 (85.84)	43.49 (5.15)	7.25 (0.86)	17.69 (2.10)	30.52 (3.61)	19.91 (2.36)	0.68 (0.08)	Nil (0.00)	844.48 (100)
2001-02	649.04 (84.37)	53.71 (6.98)	8.42 (1.09)	17.99 (2.34)	31.84 (4.14)	5.74 (0.75)	2.54 (0.33)	Nil (0.00)	769.28 (100)
2002-03	539.85 (77.48)	30.72 (4.41)	5.25 (0.75)	55.25 (7.93)	54.75 (7.86)	6.65 (0.95)	4.25 (0.61)	0.07 (0.01)	696.79 (100)
2003-04	795.30 (83.45)	28.15 (2.95)	4.45 (0.47)	56.20 (5.90)	55.85 (5.86)	7.25 (0.76)	3.55 (0.37)	2.25 (0.24)	953.00 (100)
2004-05	1145.19 (83.43)	68.74 (5.01)	6.65 (0.49)	57.13 (4.16)	81.45 (5.93)	7.85 (0.57)	4.15 (0.30)	1.50 (0.11)	1372.66 (100)
2005-06	1090.53 (82.42)	67.39 (5.09)	5.85 (0.44)	63.73 (4.82)	81.46 (6.16)	7.90 (0.60)	4.50 (0.34)	1.75 (0.13)	1323.11 (100)
2006-07	748.13 (74.61)	67.79 (6.76)	5.90 (0.59)	84.48 (8.43)	81.62 (8.14)	7.75 (0.77)	5.00 (0.50)	2.00 (0.20)	1002.67 (100)
2007-08	786.26 (81.07)	2.42 (0.25)	Nil (0.00)	82.24 (8.48)	84.90 (8.75)	7.50 (0.77)	4.65 (0.48)	1.85 (0.20)	969.82 (100)
2008-09	1205.14 (83.15)	39.74 (2.74)	3.45 (0.24)	91.89 (6.34)	92.18 (6.36)	8.25 (0.57)	6.15 (0.43)	2.50 (0.17)	1449.30 (100)
2009-10	1824.75 (83.06)	62.14 (2.83)	5.10 (0.23)	153.22 (6.98)	133.44 (6.07)	9.25 (0.42)	6.28 (0.29)	2.65 (0.12)	2196.83 (100)
2010-11	1731.42 (82.98)	64.08 (3.07)	5.08 (0.24)	169.24 (8.11)	98.87 (4.74)	8.75 (0.42)	6.25 (0.30)	3.00 (0.14)	2086.69 (100)
2011-12	1669.45 (80.78)	57.77 (2.79)	4.85 (0.23)	159.88 (7.74)	154.91 (7.50)	9.50 (0.46)	7.00 (0.34)	3.25 (0.16)	2066.61 (100)
Average	974.63 (82.16)	48.02 (4.05)	5.65 (0.48)	70.54 (5.95)	71.22 (6.00)	9.63 (0.81)	4.47 (0.38)	2.05 (0.17)	1186.21 (100)

Source: Annual Reports (1997-98 to 2011-12) of Rani Sugar

Table 4.11: Main and By-products and Sugar losses in by-products of Malaprabha Co-operative Sugar Factory Ltd (1997-98 to 2011-12)

(Percent)

Years	Main and By-products						Sugar Loss in by-products				
	Main product		Recovery of Molasses	By-products							
	Sugar percent in cane	Recovery of sugar		Recovery of fiber	Recovery of Bagasse	Recovery of filter cake	Bagasse	Filter Cake	Molasses	Undetermined by-products	Total by-products
1997-98	13.29	11.07	3.00	18.65	40.19	3.71	0.92	0.06	1.19	0.05	2.22
1998-99	12.83	10.61	3.26	17.03	37.64	4.20	0.90	0.07	1.20	0.03	2.22
1999-00	12.80	10.64	3.42	17.35	37.59	3.95	0.88	0.07	1.17	0.04	2.16
2000-01	12.77	10.54	3.58	17.14	37.19	3.82	0.88	0.07	1.23	0.06	2.23
2001-02	12.69	10.43	3.85	17.08	37.14	3.93	0.88	0.07	1.25	0.10	2.26
2002-03	13.00	10.80	4.04	17.00	35.00	4.00	0.85	0.07	1.28	0.15	2.20
2003-04	12.04	9.84	4.25	17.25	35.50	4.00	0.85	0.07	1.35	0.20	2.20
2004-05	10.95	8.73	4.42	17.75	36.12	4.00	0.75	0.07	1.45	1.00	2.22
2005-06	13.21	10.98	4.81	18.00	36.28	4.00	0.75	0.07	1.50	1.20	2.23
2006-07	12.56	10.30	4.67	18.25	33.50	4.00	0.78	0.07	1.56	1.80	2.26
2007-08	13.60	10.80	4.94	18.50	33.50	4.00	0.79	0.06	1.62	2.10	2.80
2008-09	12.86	10.01	4.71	18.85	33.54	4.00	0.78	0.08	1.83	2.23	2.85
2009-10	13.87	10.87	4.43	19.00	32.18	4.00	0.75	0.07	1.33	2.83	3.00
2010-11	13.50	10.30	4.58	19.25	32.87	4.00	0.76	0.07	1.53	2.41	3.20
2011-12	14.95	11.60	4.62	19.50	31.42	4.00	0.75	0.06	1.05	2.03	3.35
Average	12.99	10.50	4.17	18.04	35.31	3.97	0.82	0.07	1.37	1.08	2.49

Source: Records maintained by Chief Chemist of Rani Sugar

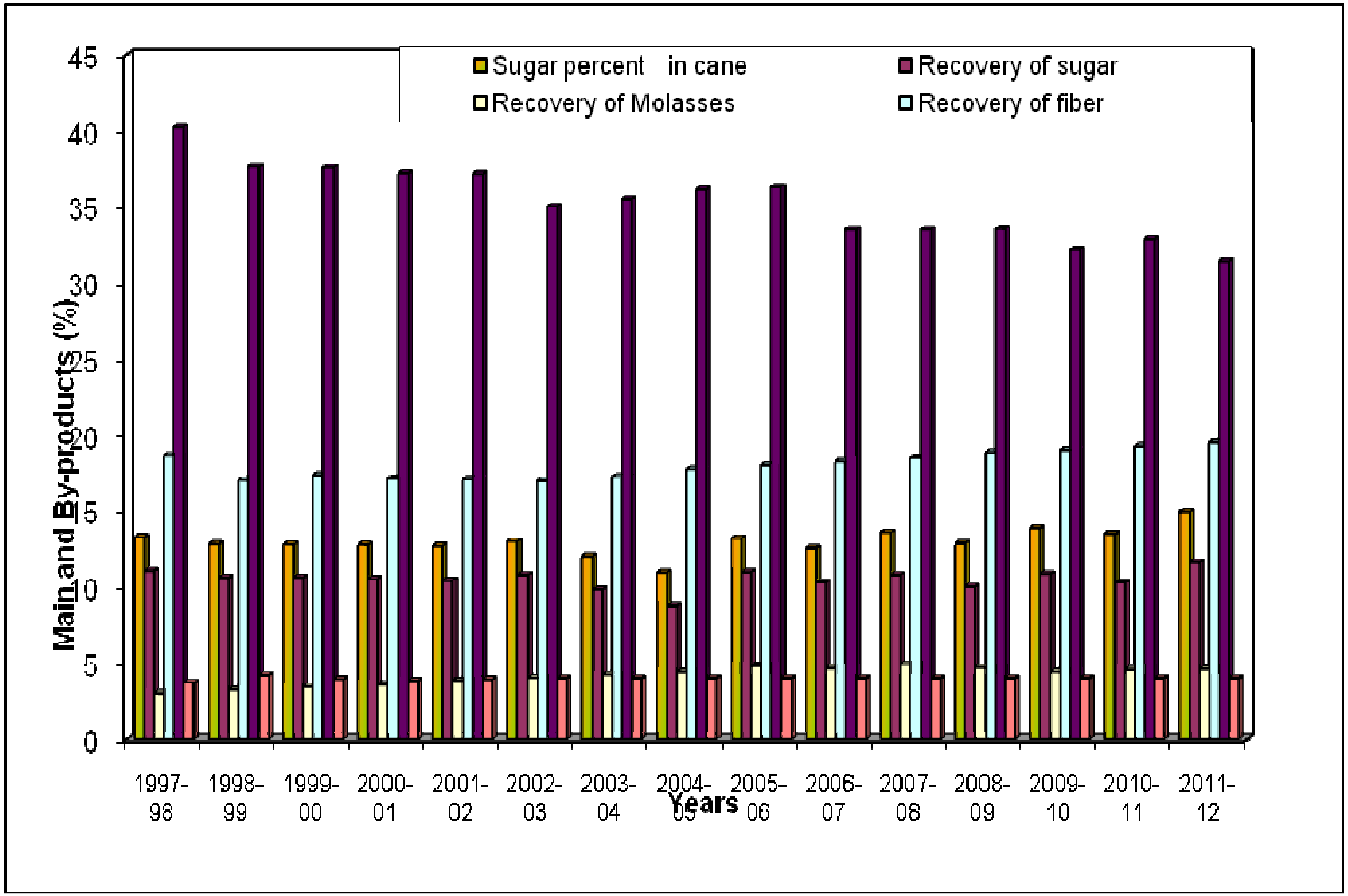


Fig 9. Main and By-products of Malaprabha Co-operative Sugar Factory Ltd (1997-98 to 2011-12)

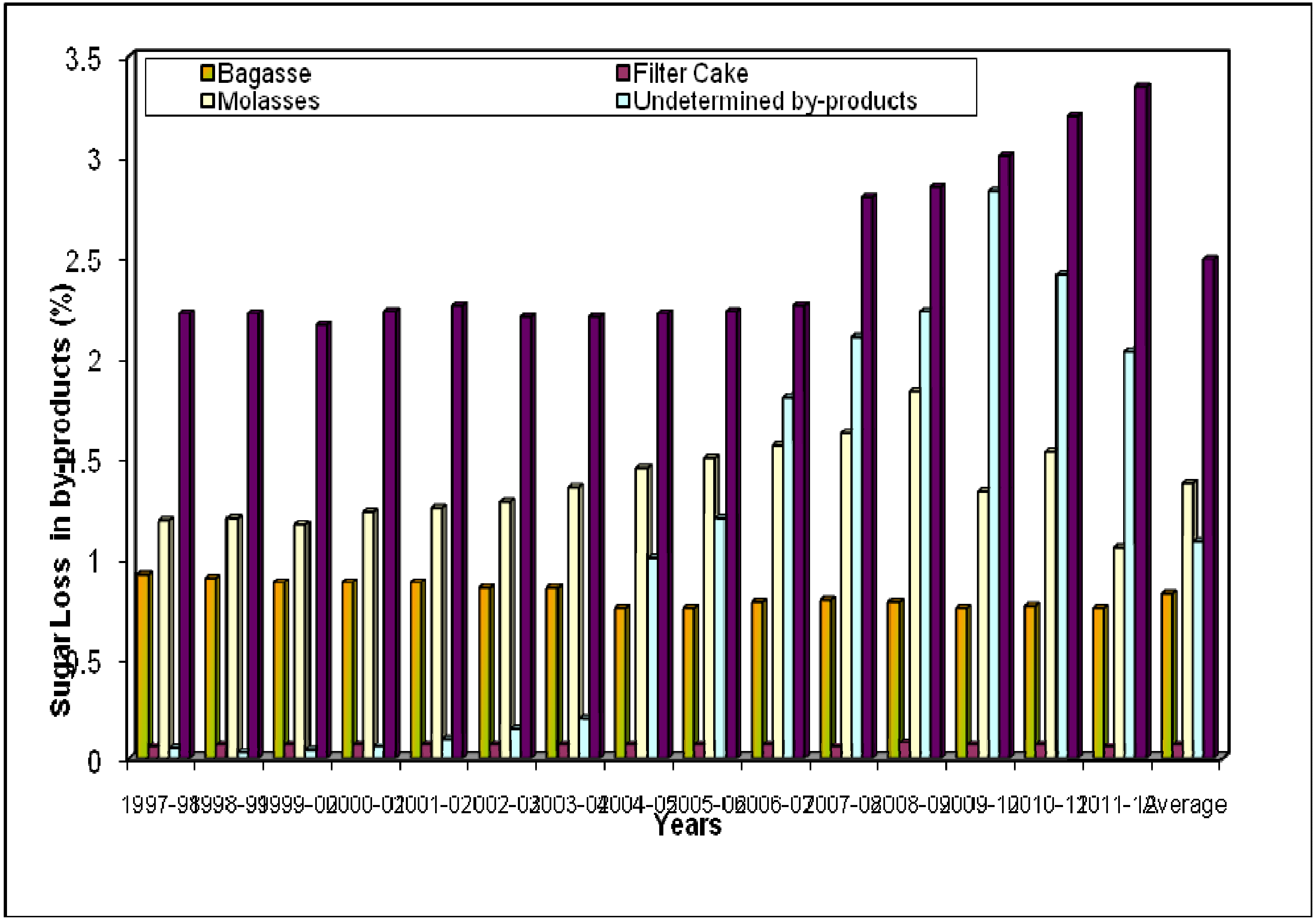


Fig 10. Sugar Loss in by-products of Malaprabha Co-operative Sugar Factory Ltd (1997-98 to 2011-12)

The sugar loss in different by-products over the years showed a fluctuating trend. The total sugar loss percent in by-products was highest in 2011-12 (3.35%) and was lowest in 1999-00 (2.16%). Average total sugar loss was 2.49 percent over the study period.

The average sugar loss in bagasse was 0.82 percent over the study period. It was highest in 1997-98 (0.92%) and lowest was in 2011-12 (0.75%).

Sugar loss in filter cake was the highest in 2008-09 (0.08%) and lowest was in 2011-12 (0.06%). Average sugar loss in filter cake was 0.07 percent over the study period.

The average sugar loss in molasses was 1.37 percent over the study period. It was the highest in 2008-09 (1.83%) and lowest in 2011-12 (1.05%).

Sugar loss in undetermined by-products was the highest in 2009-10 (2.83%) and lowest in 1998-99 (0.03%). Average sugar loss in undetermined by-products was 1.08 percent over the study period.

4.2.9 Production of different grades of sugar in Malaprabha Cooperative Sugar Factory Ltd

The production of different grades of sugar in Malaprabha Cooperative Sugar Factory Ltd is presented in Table 4.12. The production of different grades of sugar showed varying trend over the study period. The production of Medium-30 (M-30) grade of sugar was the highest 4,25,025 tonnes in 2010-11 and lowest was 2,15,155 tonnes in 2004-05. Average production of Medium-30 grade sugar was 3,35,071.40 tonnes over the study period. The production of Small-30 (S-30) grade sugar was the highest 6,25,087 in 2000-01 and lowest 82,558 tonnes in 2004-05. Average production of Small-30 grade sugar was 4,28,322.20 tonnes over the study period.

The production of total white sugar was the highest in 10,00,610 tonnes in 2007-08 and lowest in 2,97,713 tonnes in 2004-05. Average production of total white sugar was 7,63,393.60 tonnes over the study period.

The production of brown sugar was the highest in 150 tonnes in 2011-12 and lowest in 50 tonnes in 1997-98. Average production of brown sugar was 84 tonnes over the study period.

Total sugar production was the highest in 10,00,690 tonnes in 2007-08 and lowest in 2,97,773 tonnes in 2004-05. Average production of total sugar was 763477.60 tonnes over the study period.

4.2.10 Cost of production of sugar per quintal in Malaprabha Cooperative Sugar Factory Ltd

In this study an attempt had been made to estimate the cost of production of sugar per quintal.

The cost of production of sugar per quintal for the period 1997-98 to 2011-12 is presented in Table 4.13. The total cost of sugar production showed varying trend over the study period. The total cost of production was ₹ 883.40 per quintal lowest in 1997-98 and highest in ₹ 2956.31 per quintal in 2011-12. The average cost of production per quintal of sugar was ₹ 1552.26 over the study period.

The cane cost showed varying trend over the study period. The cost of cane was lowest in 1997-98 ₹ 654.25 per tonne and highest in 2011-12 ₹ 1925.50 per tonne. Average prime cost of cane was ₹ 1055.14, which worked out to be 69.02 per cent of total cost of production over the study period.

The other variable costs also showed fluctuating trend over the study period. Variable cost other than sugarcane which was lowest in 1997-98 ₹180.50 per quintal, and the highest was in 2011-12 ₹ 850.25 per quintal. Average variable cost for the study period was ₹ 407.80, contributing 26.27 per cent of total cost of production over the study period.

The total variable cost was highest in 2775.75(93.89%) ₹ per quintal in 2011-12 and lowest in 834.75(94.49%) ₹ per quintal in 1997-98 with an average 1467.73(94.55%) ₹ per quintal over the study period.

Even the fixed costs showed varying trend over the study period. The fixed costs was ₹ 48.65 per quintal in 1997-98 and increased to ₹ 58.96 per quintal in 2002-03 but decreased to ₹ 48.95 per quintal during 2003-04.and again it increased to ₹ 180.56 in 2011-12. The average fixed costs ₹89.33 accounting for 5.45 per cent of total cost of production over the study period.

Table 4.12: Production of different grades of sugar in Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(per tonne)

Years	L-30	M-30	Percentage (%)	S-30	Percentage (%)	Total White Sugar	Percentage (%)	Brown Sugar	Percentage (%)	Total Sugar production
1997-98	-	2,95,125	40.89	4,26,502	59.09	7,21,627	99.99	050	0.01	7,21,677
1998-99	-	3,10,135	33.16	6,25,023	66.83	9,35,158	99.99	080	0.01	9,35,238
1999-00	-	3,25,023	34.26	6,23,541	65.73	9,48,564	99.99	070	0.01	9,48,634
2000-01	-	3,14,545	33.47	6,25,087	66.51	9,39,632	99.99	090	0.01	9,39,722
2001-02	-	2,98,225	45.57	3,56,036	54.41	6,54,261	99.99	090	0.01	6,54,351
2002-03	-	2,58,128	37.91	4,22,555	62.07	6,80,683	99.99	080	0.01	6,80,763
2003-04	-	2,45,258	53.10	2,16,529	46.88	4,61,787	99.99	060	0.01	4,61,847
2004-05	-	2,15,155	72.25	82,558	27.72	2,97,713	99.98	060	0.02	2,97,773
2005-06	-	3,55,321	49.30	3,65,244	50.68	7,20,565	99.99	070	0.01	7,20,635
2006-07	-	3,75,125	38.64	5,95,523	61.34	9,70,648	99.99	080	0.01	9,70,728
2007-08	-	3,98,025	39.77	6,02,585	60.21	10,00,610	99.99	080	0.01	10,00,690
2008-09	-	4,00,135	63.95	2,25,416	36.03	6,25,551	99.99	080	0.01	6,25,631
2009-10	-	4,15,720	54.74	3,43,588	45.24	7,59,308	99.99	100	0.01	7,59,408
2010-11	-	4,25,025	46.46	4,89,579	53.52	9,14,604	99.99	120	0.01	9,14,724
2011-12	-	3,95,126	48.16	4,25,067	51.81	8,20,193	99.98	150	0.01	8,20,343
Average	-	3,35,071.40	43.89	4,28,322.20	56.10	7,63,393.60	99.99	084	0.01	7,63,477.60

Source: Record maintained by Chief Chemist of Rani Sugar

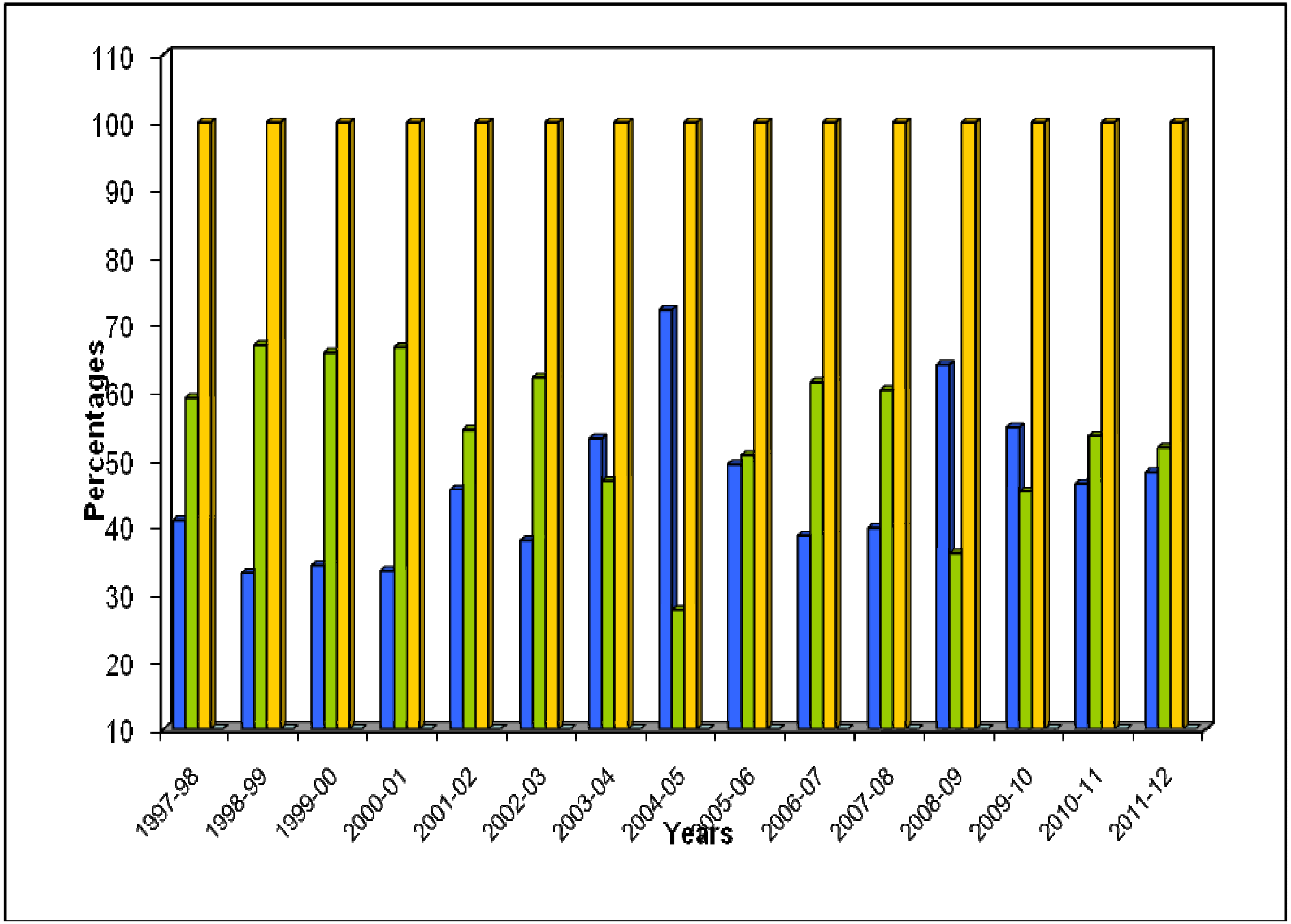


Fig 11. Production of different grades of sugar in Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

Table 4.13: Cost of production and Cost and Return per quintal of sugar in Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011- 12)

(₹ per quintal)

Years	Variable cost		Total Variable cost	Fixed cost	Total cost	By-product Sales	Price of sugar	Total Returns	Profit/Loss
	Cane cost (₹ Per tonne)	Other cost (₹ per qtl)							
1997-98	654.25 (74.06)	180.50 (20.43)	834.75 (94.49)	48.65 (5.51)	883.40 (100.00)	95.62	750.00	845.62	-33.40
1998-99	720.35 (74.04)	195.65 (20.11)	916.00 (94.15)	56.92 (5.85)	972.92 (100.00)	65.25	785.00	850.25	-87.92
1999-00	745.65 (73.00)	210.35 (20.60)	956.00 (93.60)	65.35 (6.40)	1021.35 (100.00)	72.53	859.00	931.53	-62.35
2000-01	798.56 (73.16)	220.65 (20.21)	1019.21 (93.37)	72.35 (6.63)	1091.56 (100.00)	81.25	798.50	879.75	-193.06
2001-02	810.25 (72.13)	250.46 (22.30)	1060.71 (94.43)	62.58 (5.57)	1123.29 (100.00)	91.26	880.95	972.21	-142.34
2002-03	825.35 (70.34)	288.95 (24.63)	1114.30 (94.97)	58.96 (5.03)	1173.26 (100.00)	62.35	952.25	1014.60	-121.01
2003-04	845.25 (70.76)	300.25 (25.14)	1145.50 (95.90)	48.95 (4.10)	1194.45 (100.00)	45.65	960.00	1005.65	-134.45
2004-05	880.95 (68.48)	345.65 (26.87)	1226.60 (95.35)	59.85 (4.65)	1286.45 (100.00)	65.28	990.85	1056.13	-195.60
2005-06	955.25 (68.59)	366.23 (26.29)	1321.48 (94.88)	71.25 (5.12)	1392.73 (100.00)	55.68	1100.52	1156.20	-192.21
2006-07	982.02 (69.17)	373.14 (26.28)	1355.16 (95.46)	64.50 (4.54)	1419.66 (100.00)	101.20	1320.25	1421.45	0.59
2007-08	655.49 (60.40)	384.57 (35.43)	1040.06 (95.83)	45.20 (4.17)	1085.26 (100.00)	82.25	1075.35	1157.60	90.09
2008-09	1472.18 (61.23)	718.66 (29.89)	2190.84 (91.12)	213.62 (8.88)	2404.46 (100.00)	92.35	2400.50	2492.85	96.04
2009-10	1824.75 (67.18)	730.23 (26.88)	2554.98 (94.06)	161.29 (5.94)	2716.27 (100.00)	86.25	2720.00	2806.25	103.73
2010-11	1731.22 (67.56)	701.41 (27.37)	2432.63 (94.93)	129.96 (5.07)	2562.59 (100.00)	91.23	2570.00	2661.23	107.41
2011-12	1925.50 (65.13)	850.25 (28.76)	2775.75 (93.89)	180.56 (6.11)	2956.31 (100.00)	95.62	3350.00	3445..62	493.69
Average	1055.14 (69.02)	407.80 (26.27)	1467.73 (94.55)	89.33 (5.76)	1552.26 (100.00)	78.92	1434.21	1513.13	-18.05

Source: Records maintained by Annual Reports of Malaprabha Cooperative Sugar Factory Ltd

The proportion of cane cost to total costs was highest in 1997-98 (74.06 %) and lowest was in 2007-08 (60.40 %). Average proportion of cane cost to total variable costs was 69.02 per cent over the study period.

The proportion of fixed cost to the variable cost was highest in 2008-09 (8.88%) and it was lowest in 2003-04 (4.10%). Whereas, the average proportion of fixed costs to the total variable cost was 5.45 per cent over the study period.

The relevant data relating to costs and returns sugar production for the year 1997-98 to 2011-12 are presented in Table 4.13. The total cost of sugar production per quintal showed a varying trend over the study period. The total cost of production was ₹ 883.40per quintal in 1997-98 and the highest was ₹ 2956.31 per quintal in 2011-12. The average cost of production per quintal of sugar was ₹ 1552.26 over the study period.

The price of sugar was ₹ 750.00 per quintal in 1997-98 and it increased to ₹3350.00 in 2011-12 per quintal. The average price of sugar was ₹ 1434.21 per quintal.

The price of by-product sales increased from ₹ 95.62 per quintal in 1997-98 to ₹101.20 per quintal in 2006-07 and it decreased to ₹ 95.62 per quintal in 2011-12 with an average of ₹ 78.92 per quintal over the study period.

Total returns was lowest in 1997-98 ₹ 845.62 per quintal and highest was in 2011-12 ₹ 3445.62 per quintal. The average return was ₹ 1513.13 over the study period.

The profit per quintal was the highest in 2011-12 (₹493.69) and lowest in 1997-98 (₹-33.40). The total costs and returns over the study period from ₹ 1552.26 per quintal in and ₹1513.13 per quintal respectively with profit margin of ₹ 18.05 per quintal of sugar produced.

These factors implied that the sugarcane prices, variable costs and fixed costs have increased in absolute terms as well as in relation to the total returns during the period under review.

4.2.11 Analysis of cost of production of sugar in Malaprabha Cooperative Sugar Factory Ltd

The detailed breakup of the major items of costs incurred on the production of per quintal of sugar during 2011-12 is presented in Table 4.14. The Table revealed that the variable cost like purchase tax on cane purchase was ₹57.77 (1.96%). Turn over tax on cane purchase was ₹ 9.50 (0.33%). Cess on cane purchase was ₹ 4.85 (0.16%). Cane harvesting and transportation charges were ₹ 314.79 (10.65%).Cane feeding and cane yard cleaning were ₹ 340.34 (11.51%). Salary and Wages were ₹ 660.70 (22.36%). Cane purchase incentives was ₹ 7.00 (0.23%). Machinery repairs and maintenance were ₹ 650.85 (22.02%). Manufacturing expenses was ₹ 587.62 (19.88%). By-product removal charges was ₹142.35 (4.81%). Total other variable costs were ₹ 2775.75 constituting 93.89 percent of the total cost.

Fixed costs like establishment charge was ₹35.25 (1.20%). Staff Travelling and Daily Allowances were ₹ 0.92(0.03%). Interest and Insurance were ₹75.82 (2.57%). Printing and stationary were ₹ 5.23 (0.17%). Vehicle repair and maintenance were ₹9.75 (0.33%). Social welfare expenses were ₹4.24 (0.14%). Other management expenses were ₹28.65 (0.97%). Rent, rates (interest rates) and taxes were ₹ 10.25 (0.35%). Depreciation was ₹ 10.45 (0.35%). Total fixed cost was ₹ 180.56 constituting 6.11 percent and total cost of production was ₹ 2956.31 per quintal of sugar.

4.2.12 Break Even Point Analysis of Malaprabha Cooperative Sugar Factory Ltd

The Break Even Point (BEP) was presented in Table 4.15. The fixed cost was calculated using establishment charges, staff travelling and daily allowances, interest and insurance, printing and stationary, vehicle maintenance, social welfare expenses, rent, rates and taxes and depreciation which were found to be ₹ 450.65, 556.32, 350.65, 268.65, 258.65, 155.65, 520.36 and 402.35 per quintal of sugar respectively.

The total fixed cost was found to be ₹ 3413.53 per quintal of sugar. The total variable cost was ₹ 2775.75 which included the cane cost 1669.45 ₹ per quintal of sugar, Variable cost which includes purchase tax on cane purchase, cane harvesting and transportation charges, cane feeding and cane yard cleaning, cane purchase incentive, machinery repair and maintenance, manufacturing expenses, by product removal charges which were found to be ₹ 57.77, 314.79, 642.34, 7.00,

Table 4.14: Analysis of cost of production of sugar in Malaprabha Cooperative Sugar Factory Ltd (2011-12)

Sl. No	Particulars	Cost/qtl of sugar	Percentage to the Total cost (%)
A	**Variable costs**		
1.	Purchase tax on cane	57.77	1.95
2.	Turnover tax on cane Purchase	9.50	0.32
3.	Cess on cane Purchase	4.85	0.16
4.	Cess harvesting and transportation charges	314.79	10.65
5.	Cane feeding and cane yard cleaning	340.34	11.51
6.	Salary and wages	660.70	22.36
7.	Cane purchase incentives	7.00	0.23
8.	Machinery repair and maintenance	650.85	22.02
9.	Manufacturing Expenses	587.62	19.88
10.	By-product removal charges	142.35	4.81
Total A		**2775.75**	**93.89**
B	**Fixed Costs**		
1.	Establishment charges	35.25	1.20
2.	Staff Travelling and daily allowances	0.92	0.03
3.	Interest and insurance	75.82	2.57
4.	Printing and Stationary	5.23	0.17
5.	Vehicle repair and maintenance	9.75	0.33
6.	Social Welfare Expenses	4.24	0.14
7.	Other management expenses	28.65	0.97
8.	Rent, rates(interest rates) and taxes	10.25	0.35
9.	Depreciation	10.45	0.35
Total B		**180.56**	**6.11**
Total Cost of production(A+B)		2956.31	100.00

Table 4.15: Computation of Break Even Point Malaprabha Cooperative Sugar Factory Ltd

Contribution= Sales Price-Variable Cost

Variable cost =	Cost of sugarcane	1925.50
	Other variable cost	850.25
		2775.75

Contribution = Sales Price-Variable Cost

= 3350.00-2775.75
= 574.25

Sl. No	Variable Cost	₹ in lakhs	Fixed Costs	₹ in lakhs
1.	Purchase tax on Cane	57.77	Establishment Charges	450.65
2.	Turnover tax on Cane Purchase	9.50	Interest and Insurance	350.65
3.	Cess on Cane Purchase	4.85	Printing and stationary	268.65
4.	Cess transportation and harvesting Charges	314.79	Vehicle repair and maintenance	258.65
5.	Cane feeding and cane yard cleaning	642.34	Social welfare expenses	155.65
6.	Salary and wages	560.68	Other management expenses	450.25
7.	Cane purchase incentives	7.00	Rent, rates(interest rates) and taxes	520.36
8.	Machinery repair and maintenance	550.85	Staff traveling and daily allowances	556.32
9.	Manufacturing Expenses	485.62	Depreciation	402.35
10.	By-product removal Charges	142.35		
	Total	2775.75		3413.53

$$\text{BEP} = \frac{\text{Total fixed cost}}{\text{Contribution}}$$

$$= \frac{341353000}{574.25} = 5{,}94{,}432.73 \text{ quintals/ year}$$

550.85, 485.62, 142.35 per quintal of sugar respectively. Total return was ₹ 3445.62 The Break Even Point was 5,94,432.73 quintal of sugar to be manufactured.

4.2.13 Sugar Sales and Revenue in Malaprabha Cooperative Sugar Factory Ltd

Sugar sales, revenue accrued is presented in Table 4.16.

Sugar sale under open market operations increased from 0.45 lakh tonnes in 1997-98 to 0.65 lakh tonnes in 2002-03, decreased to 0.58 lakh tonnes in 2003-04 and further increased to 0.77 lakh tonnes in 2011-12. An average sale under open market was 0.60 lakh tonnes over the study period.

Sugar sale under levy quota did not show a definite trend. It was increased from 0.32 lakh tonnes in 1997-98 to 0.60 lakh tonnes in 2002-03, decreased to 0.49 lakh tonnes in 2003-04 and further increased to 0.72 lakh tonnes in 2011-12. An average sale under levy quota was 0.55 lakh tonnes over the study period

The revenue of sugar sale under open market showed increasing trend. It was ₹1235.60 lakhs in 1997-98 to ₹6750.37 lakh in 2011-12. The average revenue from open market sales was ₹1757.44 lakh over the study period.

The revenue from sale of sugar under levy quota showed varying trend over the study period. It was highest in 2011-12 (₹8835.29lakh) and lowest in 2005-06 (₹590.68 lakh). The average revenue of sugar sales from under levy quota was ₹2193.05 lakh over the study period.

The total of sugar sales and revenue was highest in 2011-12 (₹ 15585.66 lakh) and lowest in 2005-06 (₹ 2207.68 lakh) with an average of ₹ 3950.49 lakhs.

4.3 Physical and Financial Performance of the Malaprabha Cooperative Sugar Factory Ltd during 1997-98 to 2011-12

4.3.1 Physical Performance of the Malaprabha Cooperative Sugar Factory Ltd-M.K.Hubli

The data related to number of grower members, area under sugarcane cultivation, sugarcane area under registered members, average yield; cane bill per metric tonne, duration of the crushing season, and volume of sugarcane crushed, sugar production, sugar recovery per cent of Malaprabha Cooperative Sugar Factory are presented in Table 4.17.

The number of A-class grower members decreased from 16310 in 1997-98 to 16292 in 2011-12 with annual compound growth rate of negative 0.06 per cent per annum with R square value of 0.20 which was not significant, and the B-class grower members decreased from 958 in 1997-98 to 836 in 2011-12 with annual growth rate of negative 0.98 percent per annum with R square value of 0.54 which was significant at 1% level, and the number of C-class grower members increased from 185 in 1997-98 to 197 in 2011-12 with annual growth rate of 0.29 percent per annum with R square value of 0.35 which was significant at 5% level. The total membership included registered grower members (A-class) and nonregistered-grower members (B-class), member co-operative societies and state government (C-class). The total membership decreased from 17453 in 1997-98 to 17325 in 2011-12, registering a growth rate of negative 0.10 per cent with R square value of 0.42 which was significant at 1% level.

Sugarcane cultivated in the area of operation of the sugar factory showed a varying trend over the years. It was 21280ha in 1997-98 and increased to 27225 ha in 2011-12. The annual compound growth rate was 2.00 per cent with R square value of 0.97 which was significant at 5% level.

The average yield per hectare showed varying trend over the years. The highest average yield per hectare was recorded in 2004-05 (72 metric tonnes) and lowest average yield per hectare was recorded in 2008-09 (32 metric tonnes). The annual compound growth rate was negative 3.83 per cent with R square value of 0.38 which was significant at 1% level.

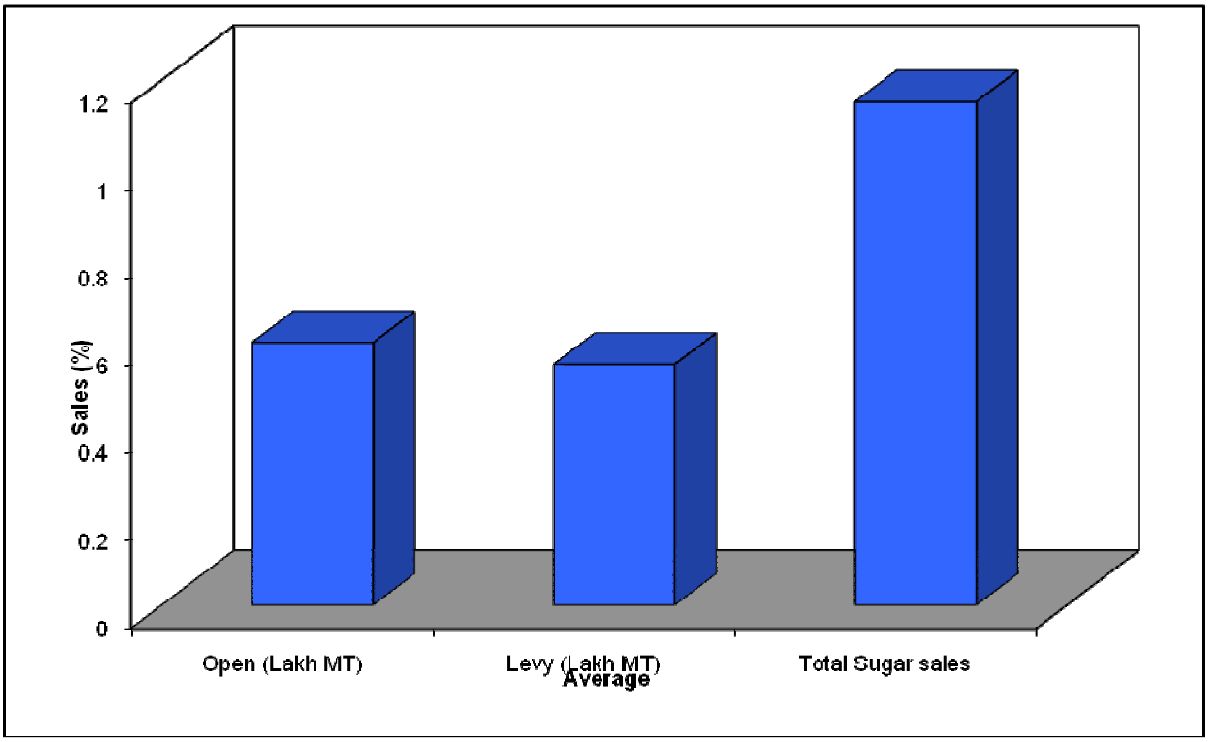
The cane bill per metric tonne which was ₹ 900 per tonne in the year 1997-98 increased to ₹ 1000 per tonne in the year 2004-05 had increased to ₹ 1200 per tonne in the year 2005-06 and it was highest at ₹ 2000 per tonne in the year 2009-10. The annual compound growth rate was 6.34 per cent with R square value of 0.64 which was significant at 5% level.

Average duration of the crushing season of the sugar factory showed a varying trend over the study period. The duration of the season was the longest in 1997-98 (206 days) and shortest in 2011-

Table 4.16: Sugar Sales and Revenue in Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

Years	Sales (%)		Total Sugar sales	Revenue (₹)		
	Open (Lakh MT)	Levy (Lakh MT)		Open Sales (₹ in lakhs)	Levy Sales (₹ in lakhs)	Total Sales (₹ in lakhs)
1997-98	0.45 (58.44)	0.32 (41.56)	0.77 (100.00)	1235.60	1325.62	2561.22
1998-99	0.52 (53.61)	0.45 (46.39)	0.97 (100.00)	1321.25	1025.34	2346.59
1999-00	0.42 (52.50)	0.38 (47.50)	0.80 (100.00)	1256.25	1254.22	2510.47
2000-01	0.56 (53.33)	0.49 (46.67)	1.05 (100.00)	1025.32	1485.88	2511.20
2001-02	0.61 (51.26)	0.58 (48.74)	1.19 (100.00)	1254.21	1542.35	2796.56
2002-03	0.65 (52.00)	0.60 (48.00)	1.25 (100.00)	1028.00	1949.77	2977.77
2003-04	0.58 (54.21)	0.49 (45.79)	1.07 (100.00)	1138.00	2437.22	3575.22
2004-05	0.49 (55.68)	0.39 (44.32)	0.88 (100.00)	1268.00	1345.33	2613.33
2005-06	0.60 (50.42)	0.59 (49.58)	1.19 (100.00)	1617.00	590.68	2207.68
2006-07	0.61 (51.69)	0.57 (48.31)	1.18 (100.00)	1242.00	2145.00	3387.00
2007-08	0.64 (52.03)	0.59 (47.97)	1.23 (100.00)	1812.00	1526.25	3338.25
2008-09	0.68 (52.31)	0.62 (47.69)	1.30 (100.00)	1263.15	1345.33	2608.48
2009-10	0.71 (51.08)	0.68 (48.92)	1.39 (100.00)	2025.50	1824.18	3849.68
2010-11	0.75 (51.37)	0.71 (48.63)	1.46 (100.00)	2125.00	4263.25	6388.25
2011-12	0.77 (51.68)	0.72 (48.32)	1.49 (100.00)	6750.37	8835.29	15,585.66
Average	0.60 (52.17)	0.55 (47.83)	1.15 (100.00)	1757.44	2193.05	3950.49

Source: Annual Report of the Malaprabha Cooperative Sugar Factory Ltd



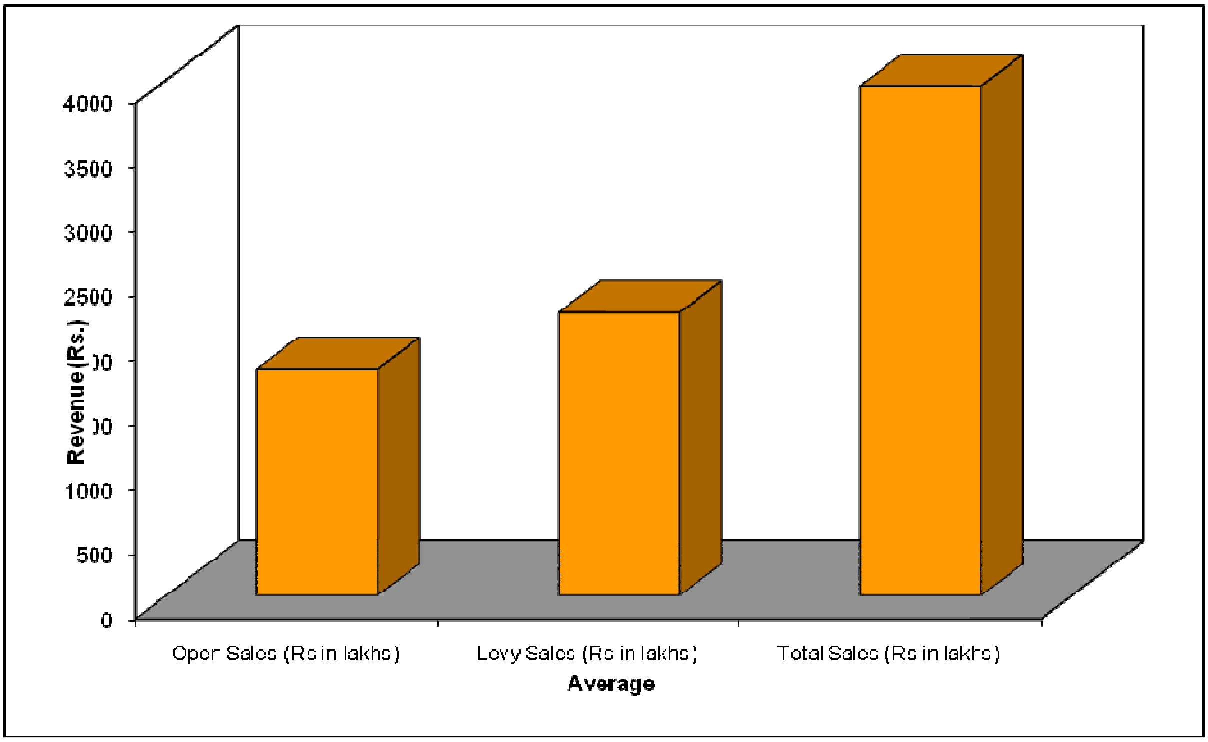


Fig 12. Sugar Sales and Revenue in Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

Table 4.17: Physical performance indicators of the Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

Particulars	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	CGR(%)	R^2
Registered Growers Membership (A –Class)	16310	16318	16420	16530	16625	16332	16329	16324	16321	16318	16315	16311	16305	16297	16292	-0.06NS	0.20
B-Class	958	942	912	920	852	808	812	816	819	819	817	819	825	833	836	-0.98**	0.54
C-Class	185	185	197	197	197	197	197	197	197	197	197	197	197	197	197	0.29*	0.35
Total membership(No)	17453	17445	17529	17647	17674	17337	17308	17337	17337	17334	17329	17327	17327	17327	17325	-0.10**	0.42
Sugarcane area under area of operation(ha)	21280	21320	20820	22530	22850	23220	23725	24220	24560	25600	25850	26225	26550	26850	27225	2.00*	0.97
Average yield(t/ha)	55	58	62	65	70	65	68	72	55	34.00	37	32	38.00	40.00	55	-3.83**	0.38
Cane bill per MT (₹)	900	800	800	800	825	800	800	1000	1200	800	900	1400	2000	1800	1800	6.34*	0.64
Average duration of the crushing season(days)	206	168	156	212	231	135	71	58	134	205	181	90	123	161	127	-2.65NS	0.09
Sugarcane crushed(MT)	4,25,829	7,82,248	5,90,012	6,21,474	4,14,335	5,01,367	2,44,687	1,00,937	3,69,775	6,21,801	5,57,444	2,07,710	3,75,679	5,03,878	4,03,966	-2.79NS	0.06
Sugar bagged(MT)	486060	834620	640360	661180	441200	565015	251875	94280	410355	644745	607475	207920	411545	521200	470810	-2.88NS	0.06
Average sugar recovery (%)	11.07	10.61	10.64	10.54	10.37	10.8	9.84	8.73	10.98	10.3	10.79	10.01	10.87	10.30	11.60	0.07*	0.01

Source: Records maintained by the Cane Development Office (CDO) and Share Section of the Rani Sugar MT: Metric Tonnes,
* 5 % significant.
** 1% significant
NS-Non significant

12 (127 days). The compound growth rate was negative at 2.65 per cent with R square value of 0.09 which was not significant.

Volume of sugarcane crushed showed decreasing trend over the study period. It was 4, 25,829 metric tonnes in 1997-98 but decreased to 1, 00,937 metric tonnes in the year 2004-05 and it increased to 4, 03,966 metric tonnes in 2011-12 with the negative compound growth rate of 2.79 percent with R square value of 0.06 which was not significant.

The quantum of sugar bagged was the highest in 1998-99 (834620 metric tonnes) and lowest was in 2004-05 (94280 metric tonnes) with the negative compound growth rate of 2.88 per cent with R square value of 0.06 which was non significant.

The average recovery per cent of sugar was the highest in 2011-12 (11.60%) and lowest in 2008-09 (10.01%). The compound growth rate was 0.07 per cent with R square value of 0.01 which was significant at 5% level.

4.3.2 Financial Performance of the Malaprabha Cooperative Sugar Factory Ltd

The data on share capital, reserve funds, owned funds, fixed assets, total borrowings, current liabilities, total liabilities, total sales, gross income, total expenses and net profit are presented in Table 4.18.

The share capital indicated the financial strength and growth of the sugar factory. It was observed that during the fifteen years period, the share capital registered 24.82 percent growth rate with R square value of 0.84 which was significant at 5% level, while in quantity terms the increase was from₹ 193.36lakhs (1997-98) to ₹ 2241.58 lakhs (2011-12.).

Reserve fund was the amount of money set aside to meet the escalation in costs or unexpected contingencies. The reserve funds account exhibited considerable growth from ₹ 11.4 lakhs in 1997-98 to ₹ 25.60 lakhs in 2011-12. The compound annual growth rate was 6.47 per cent with R square value of 0.86 which was statistically significant at 5 per cent level.

Owned funds were the difference between paid up equity funds and any accumulated losses of the sugar factory. Higher equity capital showed better performance of the business concern. The owned funds increased from ₹1314.85lakhs in 1997-98 to₹ 4069.13lakhs in 2011-12. The compound growth rate was 8.98 per cent with R square value of 0.89 which was significant at 5 per cent.

Current assets were the funds which could be converted to cash within a year to meet immediate obligations. It was increased from₹ 4221.25 lakhs in 1997-98 to₹17535.4 lakhs in 2011-12. The compound annual growth rate of current assets was 10.17 per cent with R square value of 0.80 which was statistically significant at 5 per cent level.

Fixed assets showed long term funds availability of a sugar factory to meet its long term creditors. It increased from ₹1187.48lakhs in 1997-98 to ₹ 12385.14 lakhs in 2011-12 albeit fluctuations between years. The fixed assets recorded a compound growth rate of 14.52 per cent per annum with R square value of 0.90 which was statistically 5 percent significant level.

Total assets showed a substantial increase over the study period. It was ₹ 5408.73 lakhs in 1997-98 to ₹ 29920.54lakhs in 2011-12. The compound growth rate was 11.37 per cent per annum with R square value of 0.92 which was statistically significant at 5 per cent level.

Current liabilities were the debt obligations to be met within the financial year. It was ₹ 2455.02 lakhs in 1997-98 which increased to ₹ 12271.06 lakhs in 2011-12. The compound growth rate was 12.06 per cent per annum with R square value of 0.74 which was 5 percent significant level.

Total borrowings showed varying trend over the study period. It was ₹ 955.09 lakhs in 1997-98 increased to₹ 8103.84 lakhs in 2011-12. The annual compound growth rate was 17.83 per cent per annum with R square value of 0.78 which was statistically significant at 5 per cent.

Total liabilities showed a substantial increase over the study period. It was ₹3210.11 lakhs in 1997-98 recorded to₹ 20374.90 lakhs in 2011-12. The compound growth rate was 13.91 per cent per annum with R square value of 0.91 which was statistically significant at 5 per cent level.

Sugar sales showed a substantial increase over the study period. It was ₹4250.12 lakhs in 1997-98 recorded to₹ 14014.72 lakhs in 2011-12. The compound growth rate was 4.99 per cent per annum with R square value of 0.26 which was statistically significant at 5 per cent level.

Table 4.18: Financial performance indicators of the Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2011-12)

(₹ in lakhs)

Particulars	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	CGR (%)	R^2
Share capital	193.36	193.7	96.11	375.75	353.16	904.78	904.85	904.88	1818.24	1947.96	2098.98	2161.07	2216.07	2232.57	2241.58	24.82*	0.84
Reserve fund	11.40	12.48	13.43	14.49	15.24	20.72	20.72	23.09	23.34	25.58	25.58	25.58	25.58	25.60	25.60	6.47*	0.86
Owned fund	1314.85	1442.59	1143.18	1424.47	1895.46	2543.42	2665.67	2773	2761.43	2840.54	2962.01	3186.33	3465.09	3800.03	4069.13	8.98*	0.89
Current assets	4221.25	4325.5	5623.25	6523.48	6502.52	7406.73	5681.05	4023.69	8644.62	10102.5	11412.19	10125.73	14185.32	16525.76	17535.4	10.17*	0.80
Fixed assets	1187.48	1430.54	1483.93	1598.62	1750.24	3447.1	3548.24	3526.97	3448.45	3818.78	3975.41	4732.13	5181.93	5727.14	12385.14	14.52*	0.90
Total assets	5408.73	5756.04	7107.18	8122.1	8252.76	10853.83	9229.29	7550.66	12093.07	13921.28	15387.6	14857.86	19367.25	22252.9	29920.54	11.37*	0.92
Current liabilities	2455.02	2901.91	4527.57	3480.42	3810.17	5911.37	3997.99	2189.3	6976.78	8494.08	8913.92	7710.56	11620.54	12756.24	12271.06	12.06*	0.74
Total borrowings	955.09	1123.26	729.17	1864.83	2523.45	4123.35	2816.62	1194.19	4351.94	6620.18	5808.83	5109.66	7911.86	7192.61	8103.84	17.83*	0.78
Total liabilities	3210.11	4025.19	5256.74	5345.25	6333.62	10034.72	6814.61	3383.49	11328.72	15114.26	14722.75	12820.22	19532.4	19948.85	20374.9	13.91*	0.91
Sugar sales	4250.12	4852.16	5203.15	5602.2	5862.34	8058.17	5106.05	3831.21	2132.2	5729.16	7269.35	6962.38	6746.82	9491.24	14014.72	4.99*	0.26
Sale of by-products	45.02	36.52	28.16	65.12	70.85	126.13	26.09	41.34	103.16	160.7	175.75	529.17	624.62	310.19	386.84	22.30*	0.71
Total sales	3972.78	4091.97	6661.16	6368.42	6777.05	8606.83	5806.19	4778.77	2296.93	6687.76	7806.54	7918.42	7534.69	10409.09	11539.21	4.96*	0.28
Gross income	7050.04	8415.45	6818.62	6459.83	716.13	647.05	578.64	274.85	410.94	73.38	430.38	510.13	506.32	578.07	277.90	-21.58NS	0.58
Total expenses	7047.95	8419.59	6820.26	6465.06	716.19	610.21	430.28	266.68	6843.72	7052.86	7690.62	7620.55	11961.26	12679.83	15456.70	1.14NS	0.01
Opening stock	4256.30	3852.2	4235.45	4865.2	5203.5	8560.11	5217.16	3002.82	909.47	5406.29	5892.7	5569.69	4202.55	8627.37	11160.43	3.56NS	0.08
Closing stock	3852.20	4235.45	4865.2	5203.5	8560.11	5217.16	3002.82	909.47	5406.19	5892.71	5569.69	4202.55	8627.37	11160.43	11271.25	5.46NS	0.15
Total inventory	192.20	185.05	185.06	220.05	254.25	276.06	236.1	288.19	331.81	254.67	287.15	511.73	474.17	512.4	614.58	8.51*	0.85
Net profit	2.09	4.14	1.64	5.23	0.06	36.84	148.36	8.17	41.46	61.96	83.87	65.61	17.82	108.45	36.20	34.55*	0.40

Source: Records maintained by the Account Section of Rani Sugar *5%Significant, **1% Significant NS- Non-significant

Sale of by-products showed a substantial increase over the study period. It was ₹45.02 lakhs in 1997-98 recorded to₹ 386.84 lakhs in 2011-12. The compound growth rate was 22.30 per cent per annum with R square value of 0.71 which was statistically significant at 5 per cent level.

Total sales showed increasing trend over the study period. It registered a statistically 5 percent significant compound annual growth of 4.96 per cent with R square value of 0.28 for a record level of increase from ₹ 3972.78lakhs in 1997-98 to ₹ 11539.21 lakhs in 2011-12.

Gross income was the income realized from the sale of sugar which showed a decrease from ₹ 7050.04 lakhs in1997-98 to₹ 277.90 lakhs in 2011-12. The compound annual growth rate was negative 21.58 per cent with R square value of 0.58 which was statistically non-significant.

Total expenses showed increase of₹ 7047.95 lakhs in 1997-98 to₹ 15456.70 lakhs in 2011-12. The compound growth was 1.14 per cent per annum with R square value of 0.01 which was non- significant.

Total inventory showed increasing trend from₹ 192.20 lakhs in 1997-98 to₹ 614.58 lakhs in 2011-12, over the study period. It registered 8.51 per cent annual growth with R square value of 0.85 which was significant at 5 per cent level.

Net profit was the amount earned after deducting all the expenses towards the manufacture of sugar. It increased from₹ 2.09 lakhs in 1997-98 to₹108.45 lakhs in 2010-11. However, it was again decreased to ₹36.2 lakhs in 2011-12. The compound growth rate was 34.55 per cent per annum with R square value of 0.40 which was statistically significant at 5 per cent level.

4.3.3 Financial Ratio Analysis

Ratio analysis is a popular measure of the efficiency of business. Financial ratios are calculated for a period of fifteen years from the net worth and income statements of the sugar factory. A comparison of various ratios across portfolio and over time reflects the financial strength.

Ratio analysis was carried out for the period from 1997-98 to 2011-12. In this analysis, only the average ratios were presented. However, the year-wise, ratios of the factory were calculated for detailed analysis. The selected financial ratios fall under six groups viz., tests of liquidity, tests of solvency, tests of turnover, tests of efficiency and profitability, tests of financial strength and fixed assets ratios.

4.3.3.1 Tests of Liquidity

Tests of liquidity ratios were computed to measure the ability of the sugar factory to meet its immediate maturing obligations out of its own short term resources. These ratios provided better insight into health of an enterprise in terms of liquidity and economic strength. Thus, liquidity ratios were treated as inputs to assess the quality of capital structure and portfolio distribution of an enterprise. In all, four liquidity ratios were worked out and were presented in Table 4.19.

a. Current Ratio

The ratio of current assets to current liabilities was termed as current ratio. The overall average of current ratio for the sugar factory was found to be 1.43. The ratio was found to be the highest in 2000-01 (1.87) and lowest in 2006-07 (1.19).

b. Acid Test Ratio

Acid test ratio or quick ratio provided a better measure of liquidity than the current ratio, as inventories were deducted from current assets for calculation of this ratio. The overall average of acid test ratio for the sugar factory was 1.38. The ratio was found to be highest in 2000-01 (1.81) and lowest in 2006-07 (1.16).

c. Liquid Assets to Total Assets Ratio

The overall average of liquid assets to total assets ratio was found to be 0.03, indicating that on an average the sugar factory had 3 per cent of total assets as liquid asset

d. Inventory Ratio

The overall average ratio was found to be greater than the unity indicating that, the net working capital was tied up in inventories. However, it was lowest in 2000-01 (0.07) and highest in 2008-09 (0.21).

Table 4.19: Financial Ratio Analysis of Malaprabha Cooperative Sugar Factory Ltd (1997-98 to 2012-13)

Year	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Average
Tests of Liquidity																
Current Ratio	1.72	1.49	1.24	1.87	1.71	1.25	1.42	1.84	1.24	1.19	1.28	1.31	1.22	1.30	1.43	1.43
Acid Test Ratio	1.64	1.43	1.20	1.81	1.64	1.21	1.36	1.71	1.19	1.16	1.25	1.25	1.18	1.26	1.38	1.38
Liquid Assets to Total Assets Ratio	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.03
Inventory Ratio	0.11	0.13	0.17	0.07	0.09	0.19	0.14	0.16	0.20	0.16	0.12	0.21	0.19	0.14	0.12	0.15
Tests of Solvency																
Total Debt Ratio	0.35	0.44	0.40	0.38	0.48	0.73	0.63	0.39	0.72	0.81	0.70	0.68	0.76	0.66	0.61	0.58
Fixed Assets to Owned Funds Ratio	0.90	1.00	1.30	1.12	0.92	1.36	1.33	1.27	1.25	1.34	1.34	1.49	1.50	1.51	3.04	1.38
Debt – Equity Ratio	4.66	5.45	6.66	4.78	6.85	4.46	3.04	1.29	2.36	3.35	2.73	2.34	3.53	3.19	3.57	3.88
Tests of Efficiency and Profitability																
Efficiency of Capital Ratio	0.05	0.04	0.02	0.07	0.06	0.11	0.18	0.24	0.85	0.34	0.29	0.31	0.33	0.24	0.16	0.22
Gross Profit Ratio	-0.07	-0.19	0.22	0.12	0.14	0.06	0.12	0.20	0.07	0.14	0.07	0.12	0.11	0.09	-0.22	0.07
Tests of Financial Strength																
Net-worth(₹ in lakhs)	2198.62	1730.85	1850.44	2776.85	1919.14	819.11	2414.68	4167.17	764.35	-1192.98	664.85	2037.64	-165.15	2304.05	9545.66	2122.35
Net Capital Ratio	1.69	1.43	1.35	1.52	1.30	1.08	1.35	2.23	1.07	0.92	1.05	1.16	0.99	1.12	1.47	1.32
Fixed Asset Ratio																
Return on Share Holder Equity	1.59	2.86	1.43	3.68	3.17	0.01	0.05	2.94	0.01	0.02	0.03	0.02	5.14	0.03	8.89	1.99
Return on Total Assets	3.86	7.19	2.30	6.43	7.27	3.39	0.01	1.08	3.42	4.46	5.45	4.41	9.20	4.87	1.22	4.31
Fixed Asset to Total Asset Ratio	0.22	0.25	0.21	0.20	0.21	0.32	0.39	0.47	0.29	0.27	0.26	0.32	0.27	0.26	0.41	0.29
Fixed Assets to Net worth Ratio	0.53	0.82	0.83	0.57	0.91	4.24	1.46	0.84	4.53	-3.22	5.92	2.32	-31.32	2.42	1.29	-0.52
Fixed Assets to Total Sales Ratio	3.35	2.86	4.49	3.98	3.87	2.50	1.64	1.36	0.67	1.75	1.96	1.67	1.45	1.82	0.93	2.29

4.3.3.2 Tests of Solvency

Three different ratios were developed and were made use of two measures, the share of the members of the sugar factory against the fund provided by its creditors. These ratios, presented in Table 4.19 were computed to solicit information on the ability of the sugar factory to cover its short term and long term obligations, the margin of safety offered to the creditors and the potential earnings from the use of borrowed funds.

a. Total Debt Ratio

The overall average ratio was found to be 0.58. However, it was lowest in 1997-98 (0.35) and highest in 2006-07 (0.81).

b. Fixed Assets to Owned Funds Ratio

Fixed assets to owned fund ratio was lower in 1997-98 (0.90) and the highest in 2011-12 (3.04). The overall average ratio was found to be 1.38.

c. Debt – Equity Ratio

Debt - equity ratio was found to be lowest in 2004-05(1.29) and highest in 2001-02 (6.85). The overall average ratio was found to be 3.88. This reflected the share of borrowed capital for every rupee of equity capital invested.

4.3.3.3Tests of Efficiency and Profitability

The profitability level and degree of efficiency of utilization of the resources were measured by employing different ratios. The efficiency ratios, such as gross profit ratio and profitability ratios, were presented in Table 4.19.

a. Efficiency of Capital Ratio

The overall average of efficiency capital ratio was 0.22. However, the highest ratio was in 2005-06 (0.85) and lowest was in 1999-00 (0.02).

b. Gross Profit Ratio

The overall average Gross Profit Ratio was 0.07. However, the highest ratio was in 1999-00(0.22) and lowest was in 2011-12 (-0.22). This showed that the sugar factory was spending more than its earnings as cost of sugar manufacturing.

4.3.3.4 Tests of Financial Strength

The financial strength of the sugar factory could be assessed with the help of net worth and net capital ratio. The results of these tests were presented in Table 4.19.

a. Net Worth

Net-worth showed varying trend over the study period. It was₹2198.62 lakhs in 1997-98 had decreased to ₹ 819.11 lakhs in 2002-03 and increased to ₹ 9545.66 lakhs in 2011-12. The overall average net worth was ₹2122.35lakhs over the study period.

b. Net Capital Ratio

Net capital ratio showed downward trend over the study period. It was 1.69 in 1997-98 and decreased to 1.08 in 2002-03 and increased to 2.23 in 2004-05. The overall weighted average net capital ratio was 1.32 over the study period.

4.3.3.5 Fixed Assets Ratio

Fixed assets are considered as sunk capital in production process. There needed to be a proper match between working and fixed assets. The fixed assets as a proportion to the total assets, net worth and total sales were also worked out. In addition to this Return on Share holder equity and return on total assets were worked out. The average ratio over the years was presented in Table 4.19.

a. Return on Share Holder Equity

The average return on share holder equity was 1.99.It was highest in the year2011-12 (8.89) and lowest in the year 2002-03(0.01) and 2005-06 (0.01).

b. Return on Total Assets

The average return on total assets was 4.31.It was highest in the year 2009-10 (9.20) and lowest in the year 2003-04 (0.01).

c. Fixed Asset to Total Asset Ratio

The average fixed assets to total asset ratio was 0.29. The ratio was highest in 2004-05 (0.47) and lowest in 2000-01 (0.20).

d. Fixed Assets to Net Worth Ratio

The average fixed asset to net worth ratio was found to be negative 0.52. The ratio was highest in 2007-08 (5.92) and lowest in 2009-10 (-31.32).This ratio reflected the extent of fixed assets in equity capital.

e. Fixed Assets to Total Sales Ratio

The overall average fixed asset to total sales ratio was found to be 2.29, with highest ratio in 1999-00 (4.49) and lowest in 2005-06 (0.67).

4.4 Marketing Management of sugar and its by-products

Marketing Channels for sugar

Marketing channel was the route through which a commodity passes through the producer to consumer. Three marketing channels were identified in sale of sugar.

Channel I: Producer-Wholesaler-Retailer-Consumer

Channel II: Producer –Public Distributor's System-Consumer

Channel III: Producer –Consumer (member and employee of the factory)

The Government directly procured the 40 percent of sugar production to supply the consumers at subsidized rate, and hence the question of calculating the cost of channel-II.

Since the producer sold sugar directly to grower members and employee of the factory at a fixed price by managing/ technical committee. At present the grower members got one quintal of sugar per member at ₹3350 and employee got half quintal of sugar at ₹ 3850.00. Hence, the question of calculating the cost of marketing of sugar did not arise respectively in case of channel III.

4.4.1 Price Spread in Marketing of Sugar

Price spread referred to the difference between the price paid by the consumer and price received by the producer an equivalent quantity of the farm product. Price spread studies were useful in judging the efficiency of marketing system. Various marketing intermediaries were involved in marketing of sugar, which ultimately determined the overall effectiveness of a particular marketing system. If goods could be moved from the producer to consumer at the lowest cost, while maintaining the good standard of service it denotes the better efficiency of marketing system.

An attempt was made to study the various cost elements by studying the services provided by the intermediaries and the nature and level of costs involved under Channel-I are presented in Table 4.20.

Channel-I: Producer-Wholesaler-Retailer-Consumer

The details of the costs in the marketing of one quintal of sugar is presented in Table 4.20

The producer did not incur any cost for marketing of sugar, since the wholesaler collect the sugar at their cost. Hence, the producer sale price and the wholesaler's purchase sugar through retailer to the consumer. The wholesalers transported the sugar from the factory to his shop-cum-godown and sold them to the retailer after keeping a margin of ₹ 98.80 (2.57 percent of consumer's price) for every quintal of sugar sold. The major costs incurred by the wholesaler were rent for shop and godown accounting for 0.24 percent of consumer's price and interest charges accounting for 0.21per cent of consumer's price.

Wholesaler's sale price or retailers purchase price was ₹ 3547.60 for one quintal of sugar (which formed 92.14 percent of consumers' purchases price). The major cost incurred by the retailer were rent and electricity charges accounting for 0.25 percent of consumers price and the retailer

Table 4.20: Price Spread in Marketing of Sugar under Channel-I (2011-12)

Sl. No	Item of the cost	Amount ₹/q sugar	Proportion to the Consumer Price(Percent)
1	Wholesalers purchase price at factory gate	3350.00	87.01
2	Cost incurred by the Wholesaler		
a	Rent for shop and godown	8.00	0.21
b	Labour charges for loading and unloading	4.00	0.10
c	Transportation charges	25.00	0.65
d	Licence fee	20.00	0.52
e	Storage lossess	2.00	0.05
f	Electricity charges	10.00	0.25
g	Interest charges	9.00	0.23
h	Miscellaneous charges	20.80	0.54
	Wholesalers margin	98.80	2.57
3	Retailers purchase price at wholesaler point	3547.60	92.14
4	Cost incurred by the Retailer		
a	Transportation charges	30.00	0.78
b	Handling and storage lossess	10.00	0.25
c	Rent and electricity chrges	10.00	0.25
d	Licence fee	25.00	0.65
e	Miscellaneous charges	25.80	0.67
	Retailers margin	302.40	7.86
5	Retailer price/ Consumer purchase price	3850.00	100
6	Price spread	500.00	12.98
7	Producer share in consumer rupee	1800.00	43.47
8	Processor share in consumer rupee	1550.00	40.25

Source: Records maintained by Sales Office margin was ₹ 302.40 accounting for 7.86 percent of the consumer price for sugar sold through this channels

Hence, the producer price in the consumer rupee was 87.02 the remaining 12.98 percent accounted for the wholesaler's margin, retailer's margin and also different costs incurred by them. The price spread in this channel was ₹ 500.00 (12.98 percent).

4.4.3 Revenue from Sugar and by-product sales

The details of main and by-products sales and revenue accrued over the years were presented in Table 4.21. It could be observed from the results that the factory sold by-products i.e. alcohol for industrial use prepared from molasses.

The production and sale of molasses indicated a fluctuating trend over the study period as it was influenced by the extent of crushing, efficiency, and quality of cane. The revenue realization from molasses sales was the highest in 2011-12 (₹ 981.94 crores) and lowest in 2005-06 (₹ 57.39 crores). The average sale of molasses was ₹ 367.92 crores during the study period. On an average molasses contributed around 35.92 per cent to the overall revenue of the factory.

The sale of sugar indicated varying trend over the study period. The revenue realized from the sugar sale was highest in 2004-05 (₹1602.24 crores) and lowest in 2006-07 (₹ 278.31 crores).On an average sugar contributed 64.08 percent to the overall revenue of the factory.

4.5 Problems faced by the Malaprabha Co-operative Sugar Factory Ltd.

Personnel interview method was used to know the procurement, processing, marketing, financial, human resource and miscellaneous problems faced by the sugar factory and was analyzed using Ranking Method.

Table 4.22 depicted the results of ranking method analysis of problems associated with sugar factory. Among the six factors considered under the procurement, the availability of raw materials was major problem expressed by the three management people. So this problem got assigned first rank, followed by the quality of raw materials was the problem expressed by the two management people (II rank).The two management people were expressed problems in the areas of transportation services (III rank), the price of raw materials (IV rank), the distance of availability of raw materials (V rank) and the problem expressed by the one management people was transportation cost (VI rank).

The processing problems faced by the factory were the problem of lack of sugarcane availability which was the major problem expressed by the eight management people. According to ranking, this problem got assigned with first rank followed by the problem expressed by six management people was cost of labour (II rank), problem expressed by the five management people was maintenance of Plants and Machinery (III rank), problem expressed by the four management people was availability of labour (IV rank), problem expressed by the three management people was salary of technical persons (V rank), problem expressed by the two management people was lack of storage (VI rank) and problem expressed by the one management people was availability of technical persons (VII rank).

The marketing problems faced by the factory management were expressed by the ranking method. The problem of levy price for sugar was the major problem expressed by the five management people in the factory. According to ranking, problem got assigned with first rank followed by the problem expressed by the four management people was commission charges (II rank), problem expressed by the three management people was taxes (III rank), problem expressed by the two management people was transportation cost (IV rank), problem expressed by the one management people was availability of vehicles (V rank) and problem expressed by the one management people was loading and unloading charges (VI rank).

The results of ranking method analysis of problems associated with finance are also presented. Among the four factors considered, the interest rates were major problem expressed by the two management people. So this problem got assigned first rank, followed by problem expressed by the two management people the availability of fund (II rank), problem expressed by the two management people was payment from customers (III rank) and problem expressed by the one management people was high cost of inputs/raw materials (IV rank).

Table 4.21: Revenue from Sugar and By-products sales (1997-98 to 2011-12)

(₹ in crores)

Years	Sugar	Contribution of Sugar to the Total Revenue (%)	Molasses	Contribution of Molasses to the Total Revenue (%)	Total Revenue
1997-98	545.52	77.85	155.20	22.15	700.72 (100)
1998-99	585.92	77.70	168.20	22.30	754.12 (100)
1999-00	620.45	77.56	179.50	22.44	799.95 (100)
2000-01	735.23	75.73	235.62	24.27	970.85(100)
2001-02	745.20	69.93	320.52	30.07	1065.72(100)
2002-03	550.25	58.52	390.04	41.48	940.29 (100)
2003-04	841.60	56.31	653.13	43.69	1494.73 (100)
2004-05	1602.24	88.81	201.87	11.19	1804.11 (100)
2005-06	457.21	88.85	57.39	11.15	514.60 (100)
2006-07	278.31	26.34	778.28	73.66	1056.59 (100)
2007-08	338.79	45.00	414.04	55.00	752.83 (100)
2008-09	368.73	46.73	420.42	53.27	789.15 (100)
2009-10	567.22	78.46	155.69	21.54	722.91 (100)
2010-11	402.05	49.69	407.02	50.31	809.07 (100)
2011-12	1206.31	55.13	981.94	44.87	2188.25 (100)
Average	656.34	64.84	367.92	35.16	1024.26(100)

Source: Annual Report (1997-98 to 2011-12) of Rani Sugar

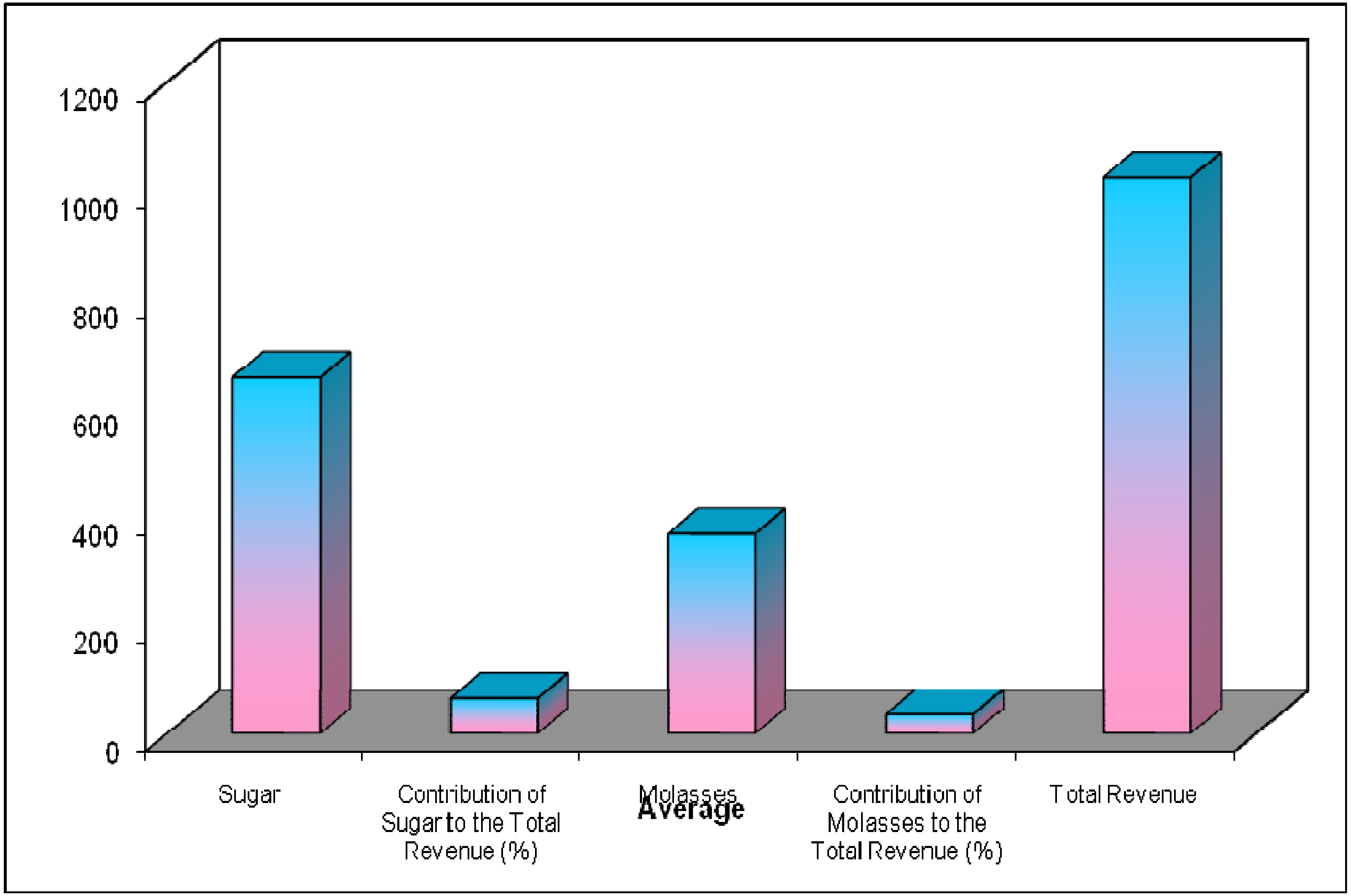


Fig 13. Revenue from Sugar and By-products sales (1997-98 to 2011-12)

4.22: Types of problems faced by the Malaprabha Cooperative Sugar Factory Ltd

Sl. No	Particulars	Rank given by Factory Department Heads	No. of Respondents
I	**Procurement Problems**		
1	Availability of Raw Materials	I	3
2	Quality of Raw Materials	II	2
3	Transportation Services	III	2
4	Price of Raw Materials	IV	2
5	Distance of availability of Raw Materials	V	2
6	Transportation Cost	VI	1
II	**Processing Problems**		
1	Lack of Cane availability	I	8
2	Cost of Labour	II	6
3	Maintenance of Plants and Machinery	III	5
4	Availability of Labour	IV	4
5	Salary of Technical Persons	V	3
6	Lack of Storage facility	VI	2
7	Availability of Technical Persons	VII	1
III	**Marketing Problems**		
1	Levy Price for Sugar	I	5
2	Commission Charges	II	4
3	Taxes	III	3
4	Transportation Cost	IV	2
5	Availability of Vehicles	V	1
6	Loading and Unloading Charges	VI	1
IV	**Financial Problems**		
1	Interest Rates	I	2
2	Availability of Fund	II	2
3	Payment from Customers	III	1
4	High cost of inputs/raw materials	IV	1
V	**Human Resource Problems**		
1	Lack of Skilled Labour	I	3
2	Labour Investment	II	2
VI	**Miscellaneous Problems**		
1	More Government Control	I	4
2	Unfavorable Government Policy	II	2

Source: Records maintained by Agriculture Section, Sales Office and Account Section of Rani Sugar

The main asset of any enterprise is manpower. If the industries get right number and skilled manpower the profitability enhance manifold. Results were depicted the problems associated with human resource of the factory. Among the two problems lack of skilled labour was the major problem expressed by the three management people in the factory. According to ranking problem got assigned with first rank followed by the problem expressed by the two management people was labour investment (II rank).

Table 4.22 also explained the miscellaneous problems faced by the factory management. Among these problems, more government control was the major problem expressed by the four management people in the factory. According to ranking problem got assigned with first rank followed by the problem expressed by the two management people was unfavorable government policy and got second rank.

DISCUSSION

The results obtained in the previous chapter are discussed in this chapter. The discussion is presented under the following heads, for the purpose of analytical clarity.

5.1 Investment pattern of the Malaprabha Cooperative Sugar Factory Ltd.

5.2 Procurement Management and Processing activities

5.3 Physical and financial performance of the factory

5.4 Marketing Management and its by-products

5.5 Problems faced by the factory

5.1 Investment pattern of the Malaprabha Cooperative Sugar Factory Ltd.

It was observed from the Table 4.1 the fixed capital investment on the sugar factory was higher on machinery and equipments (43.69%). followed by infrastructures (19.61%), land (12.67%), civil structures (6.73%), furniture and fixtures (2.95%). and other works, investment was (9.17%). This was in accordance with the findings of Kalse *et al.* (1996) and Siddaram (2004).

5.1.1 Cash flows in Sugar factory

The cash flows in the sugar factory is presented in Table 4.2 .Cash inflows, cash outflows and net cash flows were calculated for 61 years that is from 1971-72 to 2031-32 for Malaprabha Cooperative Sugar Factory Ltd. The results depicted in the Table 4.2 showed that the investment in sugar factory would amount to ₹ 6692.64 lakhs. In this case, it was found that cash outflows would increase over the years during the life of the project; this was mainly due to the expected increase in the costs associated with huge raw materials .In a similar way, there would also an increase in cash inflows over the life of the project. This was due to the fact that the capacity of the processing plants would be used to the larger extent with the passage of time and that there would be continuous increase in the demand as well as prices of the sugar and its by products. The net cash flows would be lowest in the first year; it was mainly due to the non-availability of adequate quantity of raw materials, low gross receipts and high raw material and labour cost. The reason for increasing net cash flows over the years as predicted by most of the processors was high demand for sugar, molasses, filter cake etc, in the market.

Table 4.3 presented the financial feasibility analysis for sugar factory. This analysis was carried out using analytical techniques viz., the Net Present Value, Benefit Cost Ratio, Internal Rate of Return and Payback Period.

Net Present Value

It could be observed from the Table 4.3, that the net present value at 9 per cent rate of interest found to be positive. Hence, it could be concluded that the investment in the selected unit was economically feasible and viable for another next 20 years according to estimated value.

Benefit Cost Ratio

The benefit cost ratio was 3.93. This implied that for every one rupee invested in sugar factory, there would be net returns of ₹ 3.93 in present value terms. However, since the ratio was greater than unity for sugar factory, the investment in sugar factory, irrespective of the type, was financially sound and economically feasible.

Internal Rate of Return

The internal rate of returns indicated the rate of returns that accrues to the investment. It was the rate at which the net present worth of the project was zero. The formal selection criterion with IRR was that it should exceed opportunity cost of capital for the project to be accepted. The internal rate of return was very high at 31.00 per cent. It would be highly financially feasible.

Payback period

The payback period refers to the time required to recover the initial investment in the sugar factory. The result pertaining to payback period was in line with the estimated values of

NPV, B-C ratio and IRR. While, the payback period was happened to be 2.54 years. Thus, all the criteria of financial feasibility of the project indicated that, irrespective of the type of factory, investment in sugar factory was economically feasible and financial sound in Belgaum district of Karnataka.

5.2 Procurement Management and processing activities

5.2.1 Varietal Management in the area of operation of Malaprabha Cooperative Sugar Factory Ltd.

The quality of sugarcane is paramount importance in achieving uniformly a high recovery throughout the crushing season. Variety is the pivot around which the entire sugar industry revolves and a combination of early, mid-late and late-maturing varieties and ratoon are known to help in obtaining the optimum fibre of 12 to 13 per cent with good milling qualities and juice having high sucrose and purity with minimum amount of non-sugar contents. Factory had maintained both early maturing and late maturing varieties in the area of operation.

The Table (4.4) indicated that the average area under late maturing varieties constituted about 73.97 per cent of total sugarcane area in the area of operation followed by the early maturing varieties which constituted only 26.03 per cent of total sugarcane area in the area of operation. The proportion of sugarcane under late maturing varieties to total sugarcane area decreased from the 79.46 per cent in 1997-98 to 70.08 per cent in 2011-12 because of introduction of more area under early maturing varieties.

The proportion of sugarcane area under early maturing varieties to total sugarcane area increased from 20.54 per cent in 1997-98 to 29.92 per cent in 2011-12 because of introduction of more early varieties like COC-671, COC-6032, CO-9500, than late maturing varieties like CO-7219, CO-740, CO-8014 and Co-8011 in the area of operation, and also early maturity varieties are given more yield than late maturing varieties.

Nageshwar Rao and Doss, (1990) stated that proportion of varieties maintained by factory must be 40 per cent early maturing varieties, 30 per cent mid late maturing varieties and 30 per cent late maturing varieties because the combination of low fibre-high sugar and high purity does not qualify for attaining the desired quantity. What is required is a variety that has potential to accumulate early in life; high sugar content and can progressively increase the same. The late maturing varieties are preferred by cultivators since the payment is on the weighment basis and not on the quality basis.

Management and Cane Development Officers should insist the farmers to grow more early and mid-late maturing varieties so as to combine high sugar recovery at different periods for prolonging the crushing season. Varietal programmes have to be redesigned with reference to the recommended types only taking into consideration performance under varying periods of crushing at either end of normal season or to under adoption and with reference to the recovery pattern of sugar.

5.2.2 Month-wise planting and harvesting schedule of Malaprabha Cooperative Sugar Factory Ltd

The sequential month-wise planting and harvesting of sugarcane helps the sugar factory in order to have a longer crushing period with a fairly uniform recovery throughout the crushing season. Otherwise crushing of immature cane during the early part of the season and over mature deteriorated cane during the late part of the crushing season which results in lowering the average seasonal recovery. The present system of planting of sugarcane was not in accordance to the planting schedule prepared by the factory because majority of the sugarcane growers took up sugarcane planting during (Table 4.5) in October (97.40%), November (57.08%), December (41.31%), January (31.95) due to lack of irrigation facilities and also due to lack of proper planning of sugarcane planting and delay in the beginning of the crushing season. Emphasis has to be given to have a desirable varietal composition comprising varieties belonging to different maturity group, their season etc. Proper planning of sugarcane planting and harvesting schedule is necessary.

5.2.3 Modes of transportation and their contribution in Malaprabha Cooperative Sugar Factory Ltd

In view of the perishable nature of sugarcane and the extent of deterioration that it undergoes with time after harvest, its well realized that the gap between harvest and transport should be minimized. To achieve this, the regulation and operation of the transport system from the sources of supplies to factory premises assumes greater significance, under the old practices in large parts of the country the modus operandi was to harvest the cane and get transported by the suppliers direct to the mills or through cane purchase centers, bearing almost no possibility of control of the transport movement in the hands of management of the factory. However, the Rani sugar procured the harvested sugarcane at its own cost. The chief modes of transportation in procurement of sugarcane used were the tractor, truck and bullock cart. The average contribution made by tractor, truck and cart were 39.06, 35.92 and 25.02(Table 4.6) per cent to the total cane procured respectively. Provisions were made for small farmers who wish to transport the sugarcane by the own bullock cart. To have more effective control over these modes of transportation the management must have the transport regulation, which has to be synchronized with the supply schedule from different sources and a system of recording gaps has to be effectively evolved. Correct weighment of sugarcane as purchased and the weight control of course, from the most fundamental basis and it is well cared by the management and the management exercise all possible controls in maintenance of the efficiency of these operations which hardly calls for any elaboration.

5.2.4 Sugarcane Area, Production, Cane Procurement and Capacity Utilization in the Malaprabha Cooperative Sugar Factory Ltd.

The analysis of the sugarcane area, production and cane procurement by the factory had valid impact on the performance of the factory i.e. duration of season, capacity utilization and sugar production.

The Table (4.7) indicated that there was a fluctuating trend of the sugarcane area in the area of operation. The average sugarcane area was 8, 10,460 hectares in area of operation of the sugar factory. The sugarcane area was ranging from the 3, 38,121 to 11, 28,782 hectares over the study period. The decrease of sugarcane area was due to unfavorable weather conditions and keen competition from other remunerative crops. Khothari (1995) reported that both natural and manmade causes are responsible for expansion and contraction of sugarcane area, the natural causes related primarily to factors such as weather, pests, weeds, insects and disease, the manmade factors related to price of sugarcane vis-à-vis that of sugar and Government policy regarding price and distribution of sugar and licensing of sugar factories etc. A cooperative effort between factory management and farmers should be effectively made to popularize the sugarcane cultivation. A campaign of “Sugarcane brings more gain” and sufficient and timely loans in kind and cash increased the sugarcane cultivation.

The Table 4.7 revealed the sugarcane production in the area of operation, production target fixed by the factory management, sugarcane procured sugarcane requirement for the season and capacity utilization. The average cane procured in the season was 7,49,824 metric tonnes, but the sugarcane requirement for the season was 7,83,651 metric tonnes. The sugarcane procured varied from 5,15,542 to 9,25,258 metric tonnes over the study period. Sugarcane procured was found highest during 2011-12 followed by 2010-11. While the sugarcane requirement for the season was the highest during 2011-12 (9,50,152 metric tonnes).

The factory had not procured the cane as per as the requirement for the season successively from 1997-98 to 2011-12. The proportion of cane procured to sugarcane requirement for the season varied from 84.00 to 98.91 per cent. The cause for low procurement of sugarcane than the requirement was due to the problems associated with the plant and machinery and also due to the diversion of sugarcane to other factories because of higher price for cane and delayed payment of sugarcane bill to members’ growers, and untimely lifting of sugarcane from the field. The average sugarcane procurement to the requirement for the season was 95.22 per cent of the total procurement. The factory could not achieve the requirement for the season due to non-availability of sugarcane because of competition from other private and co-operative sugar factories and Gur manufacturing units which procured the sugarcane by paying higher prices. The other reasons attributed for low target achievement was due to the technical problems associated with the machinery. Bhargava Commission (1976) also reported that low target achievement of sugar industry was due to the short supply of sugarcane, delay in payments, price paid being low and poor conditions of machinery. For achieving the targets set forth, the prime responsibility of the management was to ensure systematic follow-up of varietal and seasonal planting and maturity-wise harvesting of sugarcane programme and timely payment of sugarcane bill. To minimize the problems associated with plant and machinery, the management had to take up perfect off-season overhauling and periodic check-up by preventive and predictive maintenance techniques.

Sugarcane production in the area of operation was indicating the fluctuating trend over the study period. The average sugarcane production in the area of operation was 4,92,130 metric tonnes. The sugarcane production in the area of operation was ranging from 8,34,620 to 1,10,220 metric tonnes over the study period. The decrease of sugarcane production in some years was due to the decrease in the sugarcane area and average yield of sugarcane.

Sugarcane procured by the factory in the area of operation indicated the fluctuating trend. The average sugarcane procured by the factory was 7,49,824 metric tonnes over the study period. The total sugarcane procured by factory was ranging from 5,15,542 to 9,25,258 metric tonnes over the study period. The decrease of sugarcane procurement was due to non-availability of sugarcane.

The capacity and efficiency of the sugarcane milling units depends on the cane preparation. It had been noticed from the figures (Table 4.7) that besides the basic quantity of sugarcane procured, the deduction was also made from the cane procured because of extraneous matters like trash, nodes, immature cane, top of cane and mud etc.

The average deduction from the cane procurement was 1.17 per cent. The deduction made ranged from 0.03 to 6.67 per cent (Table 4.7) of total cane procured over the study period. The reasons attributed for higher deduction was due to higher presence of extraneous material which did not contain any sugar but also because having of water content, present in green leaves, that add the non-sugar content into the process and create load on clarification of juice, besides increase in compost quality and also dead stock which increased the load on milling and created problems in the sugar processing. Kaliya Murthy (1990), stated that an increase of 0.1 per cent trash in cane increased fibre per cent by about 0.5 per cent, increased sugar loss in bagasse by 0.05 per cent and decreased sugar extraction and over all sugar recovery by about 0.3 to 0.4 per cent. Hence, to avoid or minimize these losses, the managements had to procure the clean cane without extraneous matter coming along with cane. The harvesting of immature cane should be avoided as otherwise; it would cause staling of cane.

Capacity utilization referred to the actual quantity of cane crushed in comparison to installed capacity for the entire crushing season. It was one of vital factor influencing the operational performance of the sugar factory. Rayudu and Pattabhi, (1989) stated that the analysis of capacity utilization was an important yard-stick to measure the performance of cooperative industries.

The capacity utilization had its impact on other technical and financial performances like recovery of sugar, by-products and profit. The average capacity utilization of the factory was 66.57 per cent over the study period (Table 4.7). The capacity utilization varied from the 13.73 to 111.72 per cent over the study period. Higher capacity utilization was the key to long term financial success of the factory. Since cane crushing was seasonal in nature, care must be taken to maintain crushing capacity between 140 to 160 per cent as per efficiency norms. Management must thrive for efficient and maximum utilization of the capacity whatever is available and/or with the minor modification addition and alteration etc, is very relevant under the present circumstances as the factory could not afford to invest huge amount on major rehabilitation and modernization due to low earnings of the profits as of now.

The efforts could be channelized section-wise such as cane management. maintenance, overhauling and preventive maintenance, reduction in down time, crushing as much above capacity as possible, keeping the steam and process house in good condition, efficient labour management and proper coordination among the sections to achieve maximum utilization of the capacity.

5.2.5 Fair and Remunerative Price (FRP) of sugarcane v/s price paid by Malaprabha Cooperative Sugar Factory

In order to ensure that the sugarcane cultivators get minimum assured price for their sugarcane, the Government of India, every year fixed the Fair and Remunerative cane price to be paid by each sugar factory area under the provision of clause 3 of the Sugar Control Order 1966, under the conditions of controlled distribution of sugar.

Fair and Remunerative Price was decreased in 2004-05 and 2005-06₹ 859.40 and ₹795.00 per tonne respectively because depending upon price index of all Cooperatives and recovery per centage of the factory, Government would fix the Fair and Remunerative Price for cane in that year the price index and recovery per centage was low.

The system of paying cane price either on the basis of the technical and financial performance of the sugar factories or on the cane weight which did not give any encouragement to the cultivators to grow better variety of cane that gave higher recovery.

The average price paid per tonne of sugarcane was ₹ 1107.33, which was around 7.07 (Table 4.8) per cent more than the minimum statutory price over the study period. The sugarcane price paid per tonne of sugarcane was varying from ₹ 900 to ₹. 2000 over the study period.

5.2.6 Mode of payment of Sugarcane bill to Cane Suppliers

The price of sugarcane supplied to the sugar factories was fixed by Central Government and was payable on the basis of weight without reference to the quality of continued upto 1962-63 and under this the prices were uniformly applicable to all the sugar factories. The industry was constantly representing to the Government that the price paid for the cane should be related to its quality besides the weight. However the sugar factories in Karnataka were paying cane prices on the basis of their technical and financial performance. Soon after the completion of crushing season, accounts and records were prepared and submitted to the Directorate of Sugar, which in turn decides the ex-field price of the cane for every sugar factory in the state.

The system of paying cane price either on the basis of the technical and financial performance of the sugar factories or on the basis of cane weight which does not give any encouragement to the cultivators to grow better variety of cane with higher recovery. This system of payment of cane price is discouraging to those cultivators who grow better quality of sugarcane, they receive the same price as the other cultivators who grow inferior quality of sugarcane. A system of payment for cane on the basis of receivable sugar content is considered necessary for providing incentives to both cultivators and manufacturers to effect improvements in their respective spheres.

The average price paid per tonne of sugarcane was ₹ 1107.33 over the study period. The price paid per tonne of sugarcane was varying from ₹900.00 to ₹2000.00 (Table 4.9) over the study period.

The average price paid per tonne of sugarcane in first installment contributed as much as the 77.06 per cent of total price of sugarcane by the factory, followed by the payment in the second installment which contributed 17.55 per cent of total sugarcane price paid by the factory. The payment made in the third installment contributed only 5.39 per cent of total sugarcane price paid for sugarcane.

5.2.7 Sugarcane Procurement Cost of Malaprabha Cooperative Sugar Factory Ltd

It is evident from the Table 4.10 that on an average the prime cost of sugarcane, the basic raw material for the factory constituted ₹974.63 per tonne of sugar of total procurement cost. Prime cost of the sugarcane was varying from the ₹423.11 to₹ 1824.75per tonne of sugar to the total procurement cost over the study period. Iyer (1985) stated that the cost of sugarcane constitutes about 70 per cent of the total cost. This indicated that, the factory had paid higher price for the sugarcane.

In the year 2007-08 cess on cane purchase was nil due to exemption of purchase price by the Government.

The average tax components like purchase tax on cane, cess on purchases and turnover tax on cane purchase constituted about 48.02, 5.65, and 9.63 per quintal of sugar respectively to the total cost of procurement over the study period. The cost involved in the tax components increased because of increased procurement of sugarcane. On an average cane transportation and cane harvesting charges constituted about 71.22 and 70.54 per quintal of sugar respectively to the total cost of procurement. The rise in the price of transportation cost over the study period was due to the increase in the price of petroleum products and lack of approach road to the fields of the farmers. The rise in the harvesting charges over the study period was due to the increased price for per tonne harvesting charges paid by the factory.

The average cane incentives and cane development cess constituted only 4.47 and 2.05 to total procurement cost. A definite trend of total cost of procurement had not been established due to the variation in the raw material costs. To reduce the cost of procurement, the agriculture section had to form a programme to increase the recovery per cent of sugar in cane. Repair of the approach road to fields of the farmers should be undertaken by the factory management to reduce the transportation problems.

5.2.8 Main and By-products and Sugar losses in by-products of Malaprabha Co-operative Sugar Factory Ltd.

The efficiency of the sugar factory depended upon the good quality of cane and processing control to increase the sugar recovery which in turn increased the profit. Table 4.11, clearly indicated that the average recovery per cent of sugar was 10.50 per cent. The recovery per cent of sugar in cane was ranging from the 11.07 to 11.60 per cent over the study period. This showed that the Cane Department in the factory was efficiently managing cane Chiranijivi, (1985) also stated that the decrease in sugar per cent was due to above mentioned reasons. If the sugar per cent in cane was higher, the recovery would be high. The average fiber per cent was 18.04 per cent over the study period. The recovery per cent of fiber was ranging from 18.65 to 19.50 (Table 4.11) over the study period. The reason for increased fibre content was because of poor sugarcane quality. The optimum fiber per cent of cane must be 12.5. Chiranjivi (1985), expressed that the sugarcane quality was considered best when it contained fiber per cent of 12 to 13%. In none of the years of the study period, the fiber per cent was optimum. If the fiber content was above optimum level, the sugar loss in bagasse would be more. Further, it led to decrease in the recovery of sugar and lowers the technical efficiency of the factory. The average recovery per cent of bagasse was 35.31per cent over the study period. The recovery per cent of bagasse was ranging from 40.19to 31.42. This decreased bagasse per cent was due to decreased fibre content in the cane.

The average recovery per cent of filter cake was 3.97 over the study period. The high recovery per cent of filter cake was due to the procurement of immature, un-cleaned cane with roots, tops and trash.

Increase in fiber per cent increased the bagasse, filter cake per cent, which cause problems in processing and hold for low recovery with type of non-sugar entering the process house and creates difficulty in clarification process and boiling process. This non-sugar increases mud volume and viscosity which may reduce capacity and increases the sugar loss. In order to minimize the fiber, bagasse, filter cake per cent in cane and sugar loss in them, the management of sugar factory especially Agricultural Section has to assign more importance to procure good quality, good variety and mature cane for effective process control, Purchase scheduling according to maturity, proper balance of cane at factory – gate, regular lifting of cane from outside area of operation and fields to avoid staling in fields or centers, regular feeding and crushing to avoid staling at gate need to be followed.

The recovery of sugar varies inversely with the sugar losses, higher the sugar loss, lower would be the sugar recovery. It emphasized the importance of minimizing the sugar loss. The sugar loss stood for the sugar per cent in cane minus recovery of sugar obtained in the factory. In the manufacturing process of sugar, efforts were made to get maximum sugar from the sugarcane. However, in this process of sugar contained in the sugarcane remained in bagasse, molasses and filter cake, undetermined. The unextracted sugar content in these by-products gave us an idea to measure the sugar losses in the entire production process of sugar. According to the norms given by the Bhargava Commission (1976), the total sugar loss should not exceed 2.50 per cent of the cane. However, the sugar loss was less than 2.50 per cent of sugar per cent in cane for the entire study period. This was a good achievements by the factory (Table 4.11) indicated that the average sugar loss in by-product was 2.49 per cent of total sugar per cent in cane over the study period.

On an average, the sugar loss in molasses, constituted a maximum of 1.37 per cent, followed by undetermined, 1.08 and bagasse, 0.82 per cent. The sugar loss in filter cake constituted only 0.07 per cent of the total sugar loss.

The sugar loss in molasses varying from 1.19 to 1.83 per cent of total sugar loss. Higher the sugar loss was due to the presence of higher inorganic salts in clarification. The sugar loss in bagasse was varying from 0.75 to 0.92 per cent of total sugar loss over the study period. Higher sugar loss in bagasse was due to the poor quality of cane, imperfection in mill setting: decreased rate of imbition.

The sugar loss in filter cake varied from 0.06 to 0.08 per cent of total sugar losses over the study period. Higher sugar loss in filter cake was due to poor quality of bagasse, increased cake thickness, imperfect working.

Undetermined sugar loss varied from 0.03 to 2.83 per cent of total sugar lost over the study period. Undetermined sugar loss was highest because of inventories of sugar in the cane, loss through leakages and bacterial infection.

To minimize the sugar loss there must be an efficient coordination between Engineering and Manufacturing staff. To minimize the sugar loss in bagasse the management had to procure good quality sugarcane based on maturity survey or date of plantation. Crushing rate should be maintained at the rated capacity or even about 5 to 10 per cent higher and uniform feeding of cane into the cane carrier. To minimize the loss in filter cake, the management had to optimize the bagasse quality, thickness and perfect washing would be helped to reduce the loss in filter cake. The sugar loss in molasses could be minimized by removal of inorganic salts (ashes) in clarification. Undetermined sugar loss could be prevented by strictly adopting the mill sanitation, inhibiting the bacterial growth by strictly maintaining the ph on temperature at process house. Perfect maintenance of pumps, valves and pipe lines avoiding over flow and spoilages of cane and run over by the vehicles at cane yard.

5.2.9 Production of different grades of sugar in Malaprabha Cooperative Sugar Factory Ltd.

Table 4.12 indicated that the sugar factory had achieved a remarkable progress in the production of good quality sparkling white sugar by sulphitation process. Table 4.12 indicated that on an average the factory had produced 56.10 per cent of the small crystalled sugar (S-30), 43.88 per cent of the medium crystalled sugar (M-30) and only 0.02 per cent of brown sugar. The reason for higher production of S-30 grade sugar was due to the reduced steam consumption, reduced sugar loss, reduced massecuite per cent cane and reduced recirculation of molasses. However, the quality of S-30 grade sugar is superior than M-30 grade sugar. On an average the production of M-30 and S-30 grade sugar was 99.99 per cent to total sugar produced. Efforts should be made by the management to reduce the production of brown sugar which is obtained in the process of manufacturing of S-30 and M-30 grade sugar. Since brown sugar price is less compared to other types of sugar produced.

5.2.10 Cost of production of sugar per quintal in Malaprabha Cooperative Sugar Factory Ltd.

It can be seen from the Table 4.13 that among the different cost components, the sugarcane (raw material) cost was the major item of costs which constituted on an average 69.02 per cent to the total cost. The proportion of cane costs varied from 60.40 to 74.06 per cent of the total cost. Iyer (1985) stated that the cost of sugarcane constituted about 70 per cent of fair price of sugar. The increase in the raw material cost was due to the increase in the statutory price of the sugarcane.

Other variable cost which include cane feeding, cane yard cleaning, machinery repairs and maintenance, manufacturing expenses, by product removal charges. On an average, the cost of other variable items constituted about 26.27 per cent of the total cost. The proportion of other variable costs was varying from 20.11 to 35.43 per cent to the total cost over the study period. The increase in the cost of other variable items was due to the increase in the repair and maintenance cost, manufacturing expenses and by-product removal charges.

The total variable cost was ₹834.75 in 1997-98 to ₹2775.75 per quintal in 2011-12 with an average of ₹ 1467.73 per quintal of sugar over the study period.

On an average, the fixed cost constituted about 5.76 per cent of the total costs. The proportion of the amount of fixed cost was varying from 4.10to 8.88 per cent of the total cost over the study period. The reason for increased fixed cost was due to the increase in the salary and wages and management expenses, interest and insurance, depreciation and establishment costs.

The total cost was ₹883.40 per quintal of sugar in 1997-98 to ₹2956.31 per quintal of sugar in 2011-12 with an average of ₹ 1552.26 per quintal of sugar.

To reduce the cost of production per quintal of sugar production, sugar factory should manage to improve the milling efficiency, capacity utilization, procuring the quality cane, improving the recovery per cent of sugarcane, reducing the sugar losses in the by-products, efficient utilization of manpower and procuring quality spares for processing.

The cost of production of sugar had increased from ₹ 883.40 to 2956.27 per quintal as observed in Table 4.13. The cost of production was found to be higher during 2011-12 (₹ 2956.31 per quintal), followed by 2009-10 (₹ 2716.27 per quintal), while the return was the highest during 2011-12 accounting for ₹ 3445.62 It implied that the cost and returns obtained were almost equal with very nominal profit margin. The reasons attributed for this situation is that the sugarcane prices and other variable costs have increased both in absolute terms as well as in relation to the total returns compared to other costs during the period under review.

5.2.12 Analysis of cost of production of sugar in Malaprabha Cooperative Sugar Factory Ltd

The total cost of production per quintal of sugar during the year 2011-12 was 2956.31 (Table 4.14).Among the different cost components, the variable cost was the major item of cost, which constituted 93.89 per cent of the total cost of production of which purchase tax on cane purchase, cane transport and harvesting charges, machinery repairs and maintenance, manufacturing expenses constituted 1.95, 10.65, 22.02 and 19.88 per cent respectively to the total cost of production.

Turnover tax on cane purchase, cess on cane purchase, cane feeding and cane yard cleaning, cane purchase incentives, by-product removal charges constituted only 0.32, 0.16, 11.51, 0.23 and 4.81 per cent respectively to the total cost of production.

The fixed cost constituted 6.11 per cent of the total cost production, of which establishment charges and interest and insurance constituted major items of cost, which were 1.20 and 2.57 per cent respectively to the total cost of production. Other management expenses, Rent, rates (interest rates) and taxes, Depreciation and Vehicle repair and maintenance constituted 0.97, 0.35, 0.35, and 0.33 respectively to the total cost of production. Staff travelling and daily allowance, printing and stationary, social welfare expenses contributed only 0.03, 0.17, 0.14 per cent respectively to the total cost of production.

5.2.13 Break Even Point Analysis of Malaprabha Cooperative Sugar Factory Ltd

The Break Even level of output is the minimum output that has to be produced by the sugar factory in order to remain in the production process without sustaining losses. It was seen from the result of break even analysis (Table 4.15), that the quantity of output required to be produced to break even was higher than the existing production of sugar. To achieve Break Even point the factory has to produce 5,94,432.73 quintals of sugar.

The Break Even Point was higher due to variation in fixed cost, quantity of output produced and low procurement price of levy sugar.

5.2.14 Sugar Sales and Revenue in Malaprabha Cooperative Sugar Factory

Statutory control over the price and distribution of sugar was first introduced by the Government of India in April 1942 under the Defense of India Rules. Even prior to this, there was informal price regulation on the industry with the approval of Government of India. Since, 1942 the sugar industry had passed through various phases of price control, decontrol and partial control. Though, the price control was lifted in August 1978, it was reimposed subsequently, in the years 1988-89 to 1991-92. Free sale quota was 55:45 per cent of total sugar produced. In line with the process of liberalization of economy, the Government took some sweeping decisions to improve the condition of sugar industry in the year 1992-93 when the free sale quota was raised from 55 per cent to 60 per cent there by reducing the burden of levy sugar on industry from 45 per cent to 40 per cent.

The Table 4.16 reveals the extent of sugar sales in open market and levy sales in each year from 1997-98 to 2011-12. The average sugar sales in the open market and levy sales were found to be 0.60 and 0.55 lakh tonnes respectively.

The revenue from the sale of sugar in the open market showed a increasing trend because the quantity of sugar sold had increased. The revenue from the open market sales was the highest in the 2011-12 (₹ 6750.37lakhs) because of increased sugar sales and also rising of sugar price in domestic market. The revenue from the sale of levy sugar increased from ₹ 1325.62 lakhs in 1997-98 to ₹ 8835.29 lakhs in 2011-12 because of increased quantity of sugar sales.

5.3 Physical and Financial Performance of the Malaprabha Cooperative Sugar Factory Ltd during 1997-98 to 2011-12

5.3.1 Physical Performance of the Malaprabha Cooperative Sugar Factory Ltd.

The compound growth rate of grower membership of the factory ('A' class), (B class) and (C class) was -0.06, -0.98 and 0.29 per cent respectively. From this, it could be inferred that most of the farmers who took up sugarcane production had enrolled themselves as grower members of

Malaprabha Cooperative Sugar Factory Ltd. However, the growth rate of total membership was negative 0.10 per cent and it was significant at 1 per cent.

The growth rate of area under sugarcane within the area of operation was 2.00 per cent and average capacity utilization of factory was found to be 66.57 per cent over study period. This was an indication that the area under sugarcane had reached saturation level and there was no scope for further increase in the sugarcane area in the area of operation because of capacity utilization was reached satisfactory level.

The compound growth rate of cane crushed and sugar produced registered a negative annual growth rate of 2.79 and 2.88 per cent each respectively which were non- significant. This reflected upon the in-efficiency of the mills by failing to improve recovery per cent of sugar over the study period and procurement of sugarcane. Negative growth of above indicators were due to the decreased sugarcane production and also failure of the factory to promote sugar rich variety against the long duration and molasses rich varieties, and also because the factory could not provide needed incentives to the farmers for adopting the new varieties.

The compound growth rate of average crushing duration registered negative significant growth rate of 2.65 per cent. This was due to inadequate availability of sugarcane over the crushing period.

The compound growth rate of cane bill per metric tonne was 6.34 per cent which indicated that management was paying the higher price than the state advised price fixed by State Government (SAP) and Central Government (MSP).

5.3.2 Financial Performance of the Malaprabha Cooperative Sugar Factory Ltd

Share capital registered a statistically significant growth of 24.82 per cent per annum. This indicated the management efforts in attracting funds from the members and government to build-up the share capital (Table 4.18).

This result is contradictory with the findings of Subbarao (1985), who reported that the growth of share capital of Campco Ltd was less than that of membership which implied that, the higher growth rate in share capital was due to higher contribution of individual members and the government. Members had faith in the Malaprabha Cooperative Sugar Factory Ltd (MCSF) because the factory had been running under profit.

The reserve funds registered 6.47 per cent growth indicating that the factory had maintained sufficient reserve funds to meet unexpected shortfall in revenue. Similarly, owned funds registered 8.98 per cent growth indicating the dependence of factory on internal funding.

The current assets were short lived resources used in meeting funds needed for day today production activities. The current assets had shown a growth rate of 10.17 per cent; this was due to increase in liquid cash, the main purpose was to smoothening of day to day activities.

The fixed assets were tangible and long lived resources used in production. The fixed assets had shown a growth rate of 14.52 per cent on account of fresh investment in the fixed assets to compensate the depreciation. The total assets increased at 11.37per cent, which was mainly due to the increase in fixed assets.

Current liabilities and total liabilities increased at 12.06 and 13.91 per cent respectively and this was mainly due to increased total borrowings of the factory over the study period with the compound growth rate of 17.83 per cent. It indicated that factory had not managed its financial position in a sound basis. A comparison of growth rate of total assets and total liabilities revealed that the total liability was increasing at a faster rate. The reason for this was the increased borrowings under the cash credit arrangement as an interim arrangement for making payments of sales proceeds to the members. However, for the benefit of the factory it was better to maintain a balanced growth of current liabilities and total liabilities.

The total sugar sales of the factory registered a compound growth rate of 4.96 per cent. It was an indication of the increase in price of sugar under the free sale quota and also due to increased in the price of by products.

Gross income registered growth of negative 21.58 per cent which was statistically non-significant while, total expenses growth substantially higher at 1 per cent per annum

The inventories of the factory registered positive growth rate of 8.51 per cent, which indicated, steady increase in inventory over the study period. The growth rate of net profits was 34.55%, which was significant. The low growth of net profit might be regarded as indicators of the factory's concern over the services rather than the profit.

5.2.3 Financial Ratio Analysis

5.2.3.1 Tests of Liquidity

Liquidity ratios measured the ability of an organization to cover its short term obligations out of its short term resources were presented in (Table 4.19).

a. Current Ratio

The current ratio was widely used in all the typical balance sheet ratios. The average value of the ratio was 1.43:1 which was lesser than ideal ratio (2:1). This indicated that, the position of factory in respect of liquidity was not good to meet the short term obligations it was due for payment.

However, Flink and Grunewald (1969) observed that ratio above unity indicated a firm's ability to meet current obligations. This ratio was found to be greater than unity in all the years over the study period. Thus, it could be concluded that the sugar factory had maintained a reasonably good level of liquidity position.

b. Acid Test Ratio

This ratio was a stringent measure of liquidity, as inventories were excluded from current assets. A standard ratio of 1:1 was desirable for production units like sugar factories (Thippesha, 1997). The average ratio was 1.38:1 over the study period. This indicated that the sugar factory had maintained adequate cash balances to meet the day – to – day requirements. However, they still depended on their inventory for meeting immediate commitments.

c. Liquid Assets to Total Assets Ratio

This ratio was found to be 0.03, indicating that for every rupee of asset, three paise was available in the form liquid assets. A higher proportion of liquid assets in the total assets were a healthy sign, as any processing and trading organization should have sufficient working capital to meet the increased volume of crushing over the years.

d. Inventory Ratio

Inventory ratio measured the extent to which the net working capital finances the current assets. The average ratio was less than unity (0.15:1). A ratio was lesser than one which indicated that the net working capital was not tied up in inventory.

5.2.3.2 Tests of Solvency Ratios

Solvency was the reflection of financial strength of an organization to meet its medium and long term obligations, the margin of safety offered to the creditors and the potential earnings from the use of borrowed funds. The solvency of the sugar factory was measured in terms of three types of solvency ratios and results were presented in Table 4.19.

a. Total Debt Ratio

The ratio of total debt ratio indicated the extent of debts (in rupees) per rupee of owned funds. This ratio varied from 0.35 to 0.81 and the average was 0.58 over the study period. This revealed the reliance of Malaprabha Cooperative Sugar Factory Ltd (MCSF) more on external funds. This relationship was describing the lenders contribution for each rupee of the owner's contribution.

b. Fixed Assets to Owned Funds Ratio

The ratio of fixed assets to owned funds explained the extent of owned funds invested in fixed assets. Page *et al.* (1970) indicated that higher ratio was associated with problem of liquidation, because, the claims of the owners had to be met by sale of fixed assets, which were in non – liquid form. On the other hand, Sridharan (1975) observed the rise in the value of this ratio as a clear indication of the manifold expansion of the services provided by the institution. However, for the production, unity was desirable (Thippesha, 1997) .In the present study, the overall average ratio was found to be less than three (1.38), which was desirable as observed by Thippesha (1997).

c. Debt – Equity Ratio

The debt– equity ratio explained the extent of external dependence of the organization in relation to its equity. A ratio less than 3:1 signified the financial soundness of the organization regarding its debts and equity positions. In the present study, the debt– equity ratio was above the norm of 3:1 (3.88:1).

5.2.3.3 Tests of Efficiency and Profitability

The degree of efficiency in the utilization of resources and the profitability levels of sugar factory were measured by employing different ratios. The results were presented in Table 4.19.

a. Efficiency of Capital Ratio

A higher value of efficiency of capital ratio indicated judicious use of capital, as opined by Walker 1976, Shankaramurthy 1986 and Mattigatti 1990. In contrast, the results of the study had shown an overall average ratio of 0.22.

b. Gross Profit Ratio

This ratio measured the total expenses for every ₹1 gross income. The overall weighted average ratio was 0.07 per cent, which indicated that the factory, on an average, incurred total expenses of 0.07 for every ₹ 1gross income. A ratio less than 1 indicated that the total expenses were less than the gross income.

5.2.3.4 Tests of Financial Strength

The long run liquidity position of an organization would be reflected by the net capital ratio. It would be considered as a long term concept, along with the net – worth and equity capital ratio, as it involved the value of real estate. The results of these tests were presented in Table 4.19.

a. Net Worth

The average net-worth of the factory over the study period was found to be ₹ 2122.35 lakhs, due to creation of huge assets.

b. Net Capital Ratio

From the Table 4.19 it could be seen that the net capital ratio was more than unity (1.32) over the study period. This indicated that, the assets were sufficient to cover all the liabilities.

5.2.3.5 Fixed Assets Ratios

The fixed assets ratios viz., Return on Share Holder Equity and Return on Total Assets, Fixed Asset to Total Asset Ratio and Fixed Assets to Net Worth and Fixed Assets to Total Sales Ratio were computed and were presented in Table 4.19.

a. Return on Share Holder Equity

The overall weighted average return on share holder equity ratio was 1.99, which indicated that return formed 99 per cent of share holder equity.

b. Return on Total Assets

The overall average fixed asset to net worth ratio was 4.31, which indicated that for every rupee of total assets ₹4.31 return existed.

c. Fixed Asset to Total Asset Ratio

The overall average fixed asset to total asset ratio was 0.29, which indicated that for every rupee of total asset ₹ 0.29 fixed asset existed.

d. Fixed Assets to Net Worth Ratio

The overall average fixed assets to net worth ratio was negative 0.52, which indicated that for every rupee of net worth ₹.0.52 fixed assets existed.

e. Fixed Assets to Total Sales Ratio

The overall weighted average of fixed assets to total sales worked out to 2.29, which indicated that fixed assets formed 229 per cent of total sales.

5.4 Marketing Management of sugar and its by-products

5.4.1 Marketing Channels for sugar

The marketing of sugar from the factory to consumer was identified and it was through three channels. The factory had the liberty to sell 60 per cent of sugar produced through channel-I, (Producer-Wholesaler-Retailer-Consumer) marketing of sugar through this channel as also regulated by the government. The government released monthly quota for sale of sugar further in the open market. The factory divided the quota to be released in four weeks and the remaining 20 per cent at any week in the month as per the wishes of the factory management. The tender would be opened in a meeting which consisted of Managing Director. Administrative Officer, one member from cane grower and one member from the employee. The highest quoted tender would be accepted and sugar would sell to that dealer.

Forty per cent of sugar produced was sold as levy sugar through channel-II (Producer-Public Distributor System-Consumers). In the channel, the factory was required to sell 40 per cent of sugar produced to the Central Government under an order made under clause (7) of sub section (2) of sections 3 of Essential Commodities Act, 1955.

In channel-III (Producer- Consumer) sugar was directly sold to the grower member at ₹3350 per quintal (one q/member) and half of quintal sugar was sold to the employee at₹ 3850 per quintal (half q/employee).

5.4.2 Price Spread in Marketing of Sugar

It was observed from the Table 4.20 that the producer did not incur any cost on marketing of sugar. Thus, the producer sale price and wholesalers purchase price were the same. The marketing cost and marketing margin incurred in this channel were discussed in this chapter. The wholesalers retained only 2.57 per cent of the consumer’s price as their margin. But the retailers retained as high as 7.86 per cent of the consumer’s price as their margin. The margin realized by the retailerswas out of proportion to their services rendered and the amount of risk taken by them. The producer received only 46.75 per cent of the consumer’s price.

5.4.3 Revenue from Sugar and by-product sales

The factory on an average sold ₹ 367.92 crores worth of molasses. After the government decontrol on sale of by-products, the revenue of the factory from the sale of by-products had substantially increased. The sale of molasses was varying from₹155.20 to ₹ 981.94. The average value of sugar from sale of sugar was₹ 656.33crores. The sale of sugar varied from₹ 457.21crores to ₹1206.31 crores during 1997-98 to 2011-12 periods.

The total revenue of sugar and by-product sales was ranging from ₹ 700.72 crores to ₹ 2188.25 crores with an average of ₹1024.26 crores over the study period.

5.5 Problems faced by the Malaprabha Co-operative Sugar Factory Ltd

The major problems faced by the sugar factory were production (availability of raw material, quality of raw materials, transportation, price of raw material, distance of availability of raw materials, transportation cost), processing (lack of cane availability, cost of labour, maintenance of plants and machinery, availability of labour etc.), marketing (low price for sugar, commission, taxes etc.) financial (high interest rates , lack of availability of fund , delay payment from customers, delay payment to producers), human resource (lack of skilled labours, labour investment) and Miscellaneous (more government control, unfavorable government policy).

To overcome the above problems faced by the sugar industry Government of India replaced Minimum Statutory Price (MSP) by Fair and Remunerative Price since 2008.

SUMMARY AND POLICY IMPLICATIONS

India is the second largest sugarcane growing country in the world in terms of both area and production after Brazil. India is also the second largest sugar producer in the world accounting 13 per cent of the world's sugar production. Uttarpradesh, Maharashtra, Karnataka, Andra Pradesh, Haryana, Bihar, Gujarat and Punjab are the major sugarcane growing states in India. The sugarcane crop occupied over 50.37 lakh hectares in the country with a sugar production of 380.00 million tonnes during sugar season 2011-12..At present, there are 453 sugar mills working in India which comprises Cooperative sector (252 Mills), Private sector (134 Mills) and Public sector (67 Mills).

Karnataka Sugar Industry ranks third in terms of its contribution of sugar to total sugar production in the country and stand fourth in the country in the area under cultivation of sugarcane. The sugar industry in Karnataka has around 41 sugar factories (23 in Private and Public sector plus 18 in Cooperative sector).

In Karnataka, there are eighteen co-operative sugar factories in operation and these cooperatives crushed 92.52 lakh tonnes(45.02%) out of 205.52 lakh tonnes during 2011-12 which are distributed all over the state. The annual crushing capacity of sugar factories is 250 lakh tonnes. Belgaum district is one of the major sugarcane and sugar producers in Karnataka state. The district has ten working cooperative sugar factories. The Malaprabha Cooperative Sugar Factory Ltd was established in the year 1971 with the crushing capacity of 2500 tonnes per day. Malaprabha Cooperative Sugar Factory Ltd is purposively selected out of 18 co-operative sugar factories working in the state. The major activities of the factory are mainly procurement and processing of sugarcane and marketing of sugar and its by–products. These three activities decide the economic viability of the factory.

The present study is an attempt to assess the performance of Malaprabha Co-operative Sugar Factory Ltd-M. K. Hubli. With an objective of identifying internal and external influencing factors that are important to the factory with a view to improving its performance and contributions to economic development of the region and improvement in the standard of living of farming families involved in sugarcane cultivation and the development of sugar industry as profitable agribusiness venture.

6.1 Specific objectives of the study

1. To study the investment pattern of Malaprabha Co-operative Sugar Factory Ltd.M.K.Hubli
2. To study the procurement management and processing activities.
3. To study the physical and financial performance of the factory.
4. To study the marketing management of sugar and it's by products.
5. To study the problems faced by the sugar factory management

6.2 Methodology

The Malaprabha Cooperative Sugar Factory Ltd- M.K. Hubli was purposively selected for the evaluation of economic feasibility and financial viability as per the objectives. The data were collected both from primary and secondary sources by discussion and personnel interviews with the factory management personnel's, employees. The secondary data were collected from the published Annual Reports and other publications of the sugar factory and Primary data were collected from the concerned persons of the management at different levels were considered for eliciting the information for a period of fifteen years from 1997-98 to 2011-12. The data collected were analyzed by using various techniques viz., Tabular Analysis, Compound Growth Rate Analysis, Financial Feasibility Analysis, Financial Ratio Analysis and Break Even Point Analysis.

6.3 The major findings of the study

The important findings of the study are summarized below.

The fixed capital investment in sugar factory in the year 1971 was ₹ 6692.64 lakhs. However, the proportion of fixed capital was more because of higher proportion of investment on machinery and equipments, infrastructures, land, civil structures, fixtures and furniture's and other works. The investment on machinery and equipments (43.69 per cent) constituted a major part of the fixed capital.

A discount factor 9 per cent was employed in the financial feasibility analysis. It was found that, net present value of the investment of the sugar factory was ₹ 1338.47 lakhs. The benefit cost ratio was worked out to 3.93. The internal rate of return was 31.00 per cent. The payback period was found to 2.54 years. Hence, it was found that the investment proposal in sugar factory was financially feasible and profitable.

The proportion of sugarcane area under early maturing varieties to total sugarcane area was 29.92 per cent in 2011-12.

The sugarcane area planted in the months of October, November, December, January, February and March were constituted 97.40, 57.08, 41.31, 31.95, 20.71 and 11.30 per cent to the total sugarcane area respectively. Whereas the sugarcane area under ratoon in the months of October, November, December, January, February and March were formed 2.60, 42.92, 58.69, 68.05, 79.29 and 88.70 per cent to the total sugarcane area in the respective months.

The sugarcane transportation from the field to the factory site through different modes of transportation like tractors, trucks and bullock carts were accounted 39.06, 35.92 and 25.02 per cent respectively of the total cane transported during the study period.

The area under sugarcane in the area of operation during 2011-12 was 11,28,782 hectares. The requirement for the season, cane procurement, crushing days and capacity utilization during 2011-12 were 9,50,125 metric tonnes, 9,25,258 metric tonnes, 127 days and 54.96 per cent respectively.

The ₹ 1450.00 per tonne Fair and Remunerative Price for sugarcane was fixed by the Commission for Agricultural Costs and Prices, Government of India where as total cane bill paid by the sugar factory was ₹ 1800.00per tonne in 2011-12.

The Malaprabha Cooperative Sugar Factory Ltd was paid sugar bill in three installments namely ₹ 1450.00(80.56%), as first installment, ₹ 290.00(16.11%) as second installment and ₹ 60.00(3.33%) as third installment during 2011-12.

The sugarcane procurement cost of Malaprabha Cooperative Sugar Factory Ltd. included prime cost of cane, purchase tax on cane, cess on cane purchase, cane harvesting charges, cane transportation charges, turnover tax on cane purchases, cane purchase incentives and cane development cess were constituting ₹ 1669.45(80.78%), ₹57.77(2.79%), ₹4.85 (0.23%), ₹159.88(7.74%), ₹154.91 (7.50%),₹9.5(0.46%), ₹7.00(0.34%) and ₹3.25(0.16%) respectively during 2011-12.

The main and by-procucts Malaprabha Cooperative Sugar Factory Ltd included sugar per cent in cane, recoveries of sugar, molasses, fiber, bagasse and filter cake were representing 14.95, 11.60, 4.62, 19.50, 31.42 ans 4.00 per cent respectively in 2011-12. Similarly sugar loss in by-products included sugar loss in bagasse, filtercake, molasses,and undetermined by-products were constituting 0.75, 0.06, 1.05, 2.03 respectively during 2011-12.

Malaprabha Cooperative Sugar Factory Ltd produced three types of sugar which included M-30, S-30 and Brown sugar were representing 48.16, 51.81 and 0.01 per cent respectively during 2011-12.

The total variable cost included cane cost plus other cost representing 65.13, 28.76 per cent respectively together 93.89 during 2011-12. Total cost included total variable cost plus fixed cost was constituting 93.89, 6.11 per cent respectively in 2011-12. The price of sugar at ex-factory gate was ₹ 3350 during 2011-12.

The cost of production of one quintal sugar included variable cost, fixed cost were representing 93.89 and 6.11 per cent respectively in 2011-12.

Break even point in sugar production of Malaprabha Cooperative Sugar Factory Ltd was 5.94, 432.73 quintals per year.

The sugar sale under open market operations and levy quota were representing 51.68 and 48.32 per cent respectively in 2011-12.

The compound growth rates in respect of physical indicators viz., grower members A-class, B-class and C-class were (-0.06%), (-0.98%) and (0.29%) respectively. The total membership (-0.10%), sugarcane area under area of operation (2.00%), cane bill per metric tonne (6.34%), average yield of the season (-3.83%), and average sugar recovery (0.07%) were all significant except for sugarcane crushed, sugar bagged and average duration for crushing.

The compound growth rate of financial indicators viz., Share capital (24.82%), reserve funds (6.47%), owned funds (8.98%), current assets(10.17%), fixed assets (14.52%), total assets(11.37%), current liabilities (12.06%), total borrowings (17.83%), total liabilities (13.91%), total sales (4.96%), total expenses (1.14%), inventory (8.51%) and net profit (34.55%) were significant except the gross income and total expenses.

Financial ratio analysis employed for sugar factory to know about the financial strength of organization over the study period. The current test ratio was greater than unity (average was 1.43:1) throughout the study period. The acid test ratio found to be on an average ratio was 1.38:1. The overall liquid assets to total assets ratio was found to be 0.03, indicating that around 3 per cent of the total assets made up of liquid assets which indicated that factory had inadequate cash balance to meet day to day requirements. The inventory ratio was the lowest, even though it must be greater than unity, then the factory depend more on the net working capital to form the current assets.

Tests of solvency ratios revealed that the total debt ratio was found to be within prescribed norm of 3:1 in sugar factory. The fixed assets to owned funds ratio was found to be within the prescribed norm (i.e., less than unity) in all the years. However, the overall weighted average ratio was found to be around unity, which was desirable. Similarly, the debt – equity ratio was found to be all most within prescribed norm of 3:1 in all the years.

Tests of financial strength ratios revealed that the sugar factory had better net-worth due to creation of huge assets (₹2122.35 lakhs) with less borrowing. Similarly, the net capital ratio was found to be more than the unity.

Fixed assets ratios indicating that the sugar factory had lower fixed assets ratios (i.e., Return on Share Holder Equity, Return on Total Assets, Fixed Assets to Net Worth and Fixed Assets to Total Sales Ratios) except fixed assets to net-worth ratio, indicating that creation of insufficient fixed assets as proportion of total assets and total sales.

The major problems faced by the sugar factory were production (availability of raw material, quality of raw materials, transportation, price of raw material, distance of availability of raw materials, transportation cost), processing(lack of cane availability, cost of labour, maintenance of plants and machinery, availability of labour etc.), marketing(low price for sugar, commission, taxes etc.) financial (high interest rates , lack of availability of fund , delay payment from customers, delay payment to producers), human resource(lack of skilled labours, labour investment) and Miscellaneous (more government control, unfavorable government policy).

Policy Implications

The following policy implications and recommendations have been drawn based on the research findings for improving the performance of the factory.

1. It was found that the cane production exceeded cane crushing capacity (3500 t/ day) as revealed on the analysis. Therefore, in view of the increased supply of cane it is advised to exploit the existing utilized capacity of 34 per cent to make it more viable and profitable.
2. Coordinated efforts of cane supply section, machinery maintenance and process operators for reducing losses in the factory are of paramount importance to reduce the extent of losses as revealed by the analysis.
3. Introduction of maturity based harvesting of cane and wireless system for rapid communication and organization of efficient road transport to regulate fresh cane supply would go a long way in improvement of cane quality and recovery percentage of sugar.
4. Improvement in the recovery of sugar percentage could be geared up by growing promising varieties of sugarcane (early, late maturing varieties) in a proportion of 40:30:30 is suggested. The date of planting and ratooning has to be properly maintained and should be taken into consideration while issuing cutting order. The brix value should range between 18-20 per cent. Further, the harvesting permits are to be issued strictly based on a list of priority drawn on the basis of maturity survey.
5. Processing of the cane with trash tops, binders, mud etc. as such uncleaned cane along with

dead and diseased should be eliminated with the cooperation of farmers and by launching a campaign “sugar is made in the field and not in the factory” which would go a long way to improve the recovery percentage of the sugar and reduction in variables costs.

6. The time lag between harvesting and crushing should not be more than 12 hours to achieve the optimum results, which exceeds 4 hours from the normal time. In view of this, it is suggested to regulate the supply of cane by allotting speedy vehicles such as trucks, and tractors only in proportion to the density of cane areas under various distance groups identified.
7. Repair of approach road from the field to factory premises to reduce the time lag between harvesting and crushing is of vital importance and the factory management should help the farmers to harvest their sugarcane by providing the gang men to harvesting their sugarcane which would help them to save the time and reduce the burden of harvesting and time saving.
8. The factory should have a separate cane development section and cane procurement section which may help in efficient production and procurement operations of the factory.
9. Bagasse as one of the important by-products obtained is used as fuel in boiling section instead the same can be used as raw material for paper making if it is sent to the paper mill for realizing more values as raw material in paper industry. Instead, coal fire method can be adopted in boiling section of the factory.
10. The analysis of physical indicators of the sugar factory showed that most of indicators found to be negative showing poor performance of the sugar factory the management needs to gear up the physical indicators so as to make it more viable.

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BUSINESS PERFORMANCE OF MALAPRABHA COOPERATIVE SUGAR FACTORY LTD-M. K. HUBLI

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ABSTRACT

The Malaprabha Cooperative Sugar Factory Ltd was established in the year 1971. The objectives of the study were to examine investment pattern, procurement management and processing activities., physical and financial performance indicators, marketing management of sugar and it's by products and problems faced by the sugar factory management. The fixed capital investment in sugar factory was ₹ 6692.64 lakhs. However, the proportion of fixed capital was more; investment on machinery and equipments (43.69 percent) constituted a major part of the fixed capital. It was found that, net present value of the investment of the sugar factory was ₹ 1338.47 lakhs. The benefit cost ratio was worked out 3.93. The internal rate of return was 31.00 percent. The payback period was found to 2.54 years. Descriptive statistics and growth rates were computed for various performance indicators. The growth in physical performance indicators were duration of crushing season was found maximum (231 days) in 2001-02 and average sugar recovery was found maximum (11.60%) during 2011-12. The compound growth rate of financial indicators viz., Share capital (24.82%), reserve funds (6.47%), owned funds (8.98%), fixed assets (14.52%), sale of by-products (22.30%) and current assets (10.17%) were significant. The current ratio was greater than unity. Tests of solvency, Test of efficiency and profitability, Test of financial strength and fixed asset ratios were found to be better. The production cost per quintal of sugar was ₹3350.00 during 2011-12. The average main and by-products like molasses, bagasse, filter cake and fiber were 12.99, 4.17, 35.31, 3.97and 18.04 percent respectively and similarly sugar losses in by-products like molasses, bagasse, filter cake and undetermined were 1.37, 0.82, 0.07 and 1.08 percent respectively. Problems faced by the factory were procurement, processing, marketing, financial, human resource and miscellaneous.