

MANAGEMENT OF INVENTORIES IN SUGAR INDUSTRY – A COMPARATIVE STUDY OF SELECT SUGAR MILLS IN NORTHERN INDIA

India is the second major sugar producing country in the world, the first one being Brazil. Sugar industry occupies an important place among organized industries in India. Sugar industry, one of the major agro-based industries in India, has been instrumental in resource mobilization, employment & income generation and creating social infrastructure in rural areas. Indeed, sugar industry has facilitated and accelerated pace of rural industrialization. At present, there are 634 installed sugar factories, having annual installed production capacity of 230.01 lakhs tonnes, out of which only 488 factories are operational. More than 4.50 crore farmers are engaged in sugarcane cultivation and about 5 lacs rural people have got direct employment in the industry. Sugar industry has brought socio-economic changes in rural India by way of facilitating entrepreneurial activities such as dairies, poultries, fruits & vegetable processing and providing educational, health and credit facilities.

Traditional sweeteners Gur & Khandsari are consumed mostly by the rural population in India. With better standard of living and higher incomes, the sweetener demand has shifted to white sugar. In the early 1930's nearly 2/3rd of sugarcane production was utilised for

production of alternate sweeteners, Gur & Khandsari. With better standard of living and higher incomes, the sweetener demand has shifted to white sugar. Currently, about 1/3rd sugarcane production is utilized by the Gur & Khandsari sectors. Being in the small scale sector, these two sectors are completely free from controls and taxes which are applicable to the sugar sector.

The advent of modern sugar processing industry in India began in 1930 with grant of tariff protection to the Indian sugar industry. The number of sugar mills increased from 30 in the year 1930 - 31 to 135 in the year 1935-36 and the production during the same period increased from 1.20 lakh tonnes to 9.34 lakh tonnes under the dynamic leadership of the private sector.

The era of planning for industrial development began in 1950-51 and Government laid down targets of sugar production and consumption, licensed and installed capacity, sugarcane production during each of the Five Year Plan periods.

Effective inventory flow management in supply chains is one of the key factors for success. The challenge in managing inventory is to balance the supply of inventory with demand. A company would ideally want to have enough inventories to satisfy the demands of its customers- no lost sales due to inventory stock-outs. On the other hand, the company does not want to have too much

inventory staying on hand because of the cost of carrying inventory. ***Enough but not too much*** is the ultimate objective.

The inventory investment for a small business takes up a big percentage of the total budget, yet inventory control is one of the most neglected management areas in small firms. Many small firms have an excessive amount of cash tied up to accumulation of inventory sitting for a long period because of the slack inventory management or inability to control the inventory efficiently. Poor inventory management translates directly into strains on a company's cash flow.

Effective inventory management is essential in the operation of any business. Three different trends in the development of logistics solutions within industry, one trend is concerned with the increased integration of logistics activities beyond organization boundaries with an aim to reduce cost items such as capital costs for inventory and handling costs of flows.

Inventory as an asset on the balance sheet of companies has taken on increased importance because many companies are applying the strategy of reducing their investment in fixed assets, like plants, warehouses, equipment and machinery, and so on, which even highlights the significance of reducing inventory .

Changes in inventory levels affect return on assets (ROA), which is an important financial parameter from an

internal and external perspective. Reducing inventory usually improves ROA, and vice versa if inventory goes up without offsetting increases in revenue.

The wholesalers and retailers that are major actors involved in downstream distribution channels face a special challenge in keeping inventory at reasonable levels due to the difficulty of forecasting demand and expectations of customers about product availability. The challenge grows even bigger when we think about the diversity of products in terms of their color/design, package type, size and so on. To further explain the problem, we assume there is an accurate demand forecast; however, the aggregate demand needs to be broken down by various specifications of the product into sub-total demand forecast to guide the stock keeping units (SKUs) in the company in order to fulfill the final customer's order. But the sub-total demand forecasts could be diverse, reaching dozens, hundreds, or even thousands of categories; in that case, they become truly difficult, complex and time-consuming.

The difficulty of forecasting demands accurately naturally results in two problems, which are in opposite extreme, overstock and stock-out of inventory. As companies strive to avoid lost sales from stock-out of inventory, there is a tendency to overstock. Nevertheless, because keeping inventory is costly which definitely reduces the profit margin, companies try to reduce the inventory level, so appears the tendency to stock-out of inventory. One

can get an overview of inventory management dilemma, where two opposing powers keep pulling the inventory towards their own direction. It is hard to balance the two powers all the time and station the inventory at the right level constantly.

Organizations can take two different approaches with regard to inventory. They can assume it is a necessary evil and implement a special inventory reduction program whenever cash gets tight. Or they can make strategic decisions on the level to carry, put an active inventory management process in place and continually improve the business results. Following the active inventory management strategy helps create world class lean inventory.

Inventory should be viewed as cash that could have been spent in other ways. Anything above what the customer needs is waste. Unfortunately accounting treats it as an asset. But as anyone that has dealt with inventory knows, storing it, counting it, finding it, and picking it becomes much harder as the inventory grows.

Inventory is kept to meet demand, in light of dependent demand and independent demand, different approaches to managing inventory should be applied to align inventory supply with demand. Just-in-Time (JIT) approach and Materials Requirements Planning (MRP) system are typically associated with managing manufacturing inventory to serve dependent demand.

Cross-docking is a typical approach for managing distribution inventory efficiently. Nevertheless, Vendor-managed-inventory (VMI) approach is applicable both for manufacturing inventory and distribution inventory.

If stock-out occurs, different scenarios will happen. Subject to distribution inventory stock out or manufacturing inventory stock-out, the impact on the supplier and the customer is different in terms of extent and scale, i.e. the impact is greater and more serious for one party than the other one. So the attitude toward stock-out varies accordingly. For instance, if there is a inventory stock-out in the manufacturing companies like Mawana Sugars Ltd. and Simbhaoli Sugars Ltd., the result is critical. The production line will be shut down and startup costs are very high. Hence such stock-out is prohibited. In case of distribution inventory stock out, the impact on the customer is usually not big and serious, e.g. it is not a big deal when consumers encounter such a stock-out, therefore their counterparts-the suppliers, such as wholesalers and retailers, tolerate stock-outs.

When a supplier is unable to satisfy demand with available inventory, one of four events may occur: (1) the customer waits until the new replenishment arrives; (2) the customer back orders the product; (3) the sale is lost; (4) the customer is lost (Coyle et al., 2003). For most companies, the four results are listed from best to worst in terms of the impact. Safety stock is one kind of inventory which can

protect against fluctuations in demand or supply. And he also indicated that 'the quantity of safety stock is built into the reordering system's calculation in a manner that the inventory is not planned for consumption under normal (perfect) circumstances.'

Because of the situation of uncertainty in demand or delays in lead time or inadequate delivery, the company needs a small amount of safety stock on hand. In other words, the basic function of safety stock is to avoid stock-outs.

Another reason for setting safety stock is it could affect customer service level. When the actual order quantity from the customer is more than prediction, the safety stock needs to be held to avoid customer service problems. The customer service levels vary by industries which mean the customer acceptance for stock-out is different.

The setting of safety stock will base on the trade-off between service level and inventory investment. The quantity of safety stock should cover more than normal demand during the replenishment lead time. There are some parameters that should be considered when calculating the suitable quantity of safety stock, such as recent demand needs, lead time and the target service level.

Inventory is one of the most important components of working capital and its proper management cannot be under stressed. Fundamentally, inventory consists of raw

material, work in progress and finished goods. Hence inventory management is crucial for all managers irrespective of functional specialization. Since a number of industrial relations disputes in manufacturing industries are linked to production bonus and incentives relating to inventory irrespective of the market need for inventory, the HR Manager must understand this point well. Every member of the organization feels its impact and yet scant respect is paid to it. This is most unfortunate. A serious study of sick companies will support this contention. Hence those managers who are involved with Strategic HR should take note of some of these important criteria for insuring proper management.

The demand-supply situation for sugar is largely determined by supply side dynamics, with demand growth having been quite stable at 2-3% per annum in the recent past. Sugar is supplied either in the levy or the free form, with the levy sales finding their way into the PDS of the Government of India. The sale of free sale sugar is governed by a monthly release mechanism, which decides the extent of sugar which can be sold by the sugar companies independent of their production levels. The supply mechanism has necessitated that sugar companies absorb the variations in inventory levels depending upon the fluctuations in the sugarcane output, which they need to compulsorily process. However, the release mechanism has also allowed the sugar companies to maintain a certain amount of stability in their realizations, despite their

increasing production and hence stocking levels in recent times. The situation could however change quite significantly if the release mechanism for distributing sugar gets dispensed with, which would lead to the pricing of sugar becoming a function of demand supply positions in individual markets. The threat of imports is however limited due to the high level of import duties on finished sugar, which are within the permissible limits specified by the WTO. The Indian market is presently witness to over-supply conditions, however Indian producers have demonstrated limited export capabilities in the past, which have primarily been on account of high non tariff barriers in importing countries, and a high level of subsidies provided to the exporting countries. Perceived low quality of Indian sugar has also been a contributing factor to sluggish export performance. ICRA's assesses the demand supply position for sugar in and around the command area of the sugar mill, a producer's quality and its cost competitiveness in being able to supply under different pricing environments, along-with its ability to export its surplus production.

Objectives of the Study

The main objectives of the study can be categorized as under-

1. To define the concept, importance, objectives and factors etc. of inventory and inventory management.
2. To review the views of different authors & wizards on inventory management.

3. To explain the various techniques of inventory control with their merits and demerits and to examine & determining the most suitable inventory control technique for a sugar industry.
4. To throw light on the profile of both sugar mills.
5. To analyze the inventory management in Mawana Sugars Limited.
6. To analyze the inventory management in Simbhaoli Sugars Limited.
7. To compare & analyze the inventory management of both sugar mills.
8. To bring to surface the findings on various aspects of inventory management of both sugar mills along with the suggestions for improvement of inventory management.

Limitations of the Study

Normally, all the research projects are usually hindered in their smooth flow by some unforeseen and unpredictable problems. The problems arise in the form of constraints by way of scope of the study, budget, time etc. The current research is also no exception to all these factors.

The present study was also conducted under certain limitations. It remained not only difficult but just next to impossible to convince the managerial authorities of both the sugar mills that the purpose of our present research is

to study the management of inventory and nothing else. But, unfortunately, a strong unwillingness on the part of their management to participate and aid the research made it difficult to move in the desired direction most of the times. As a result, this study is mainly based upon the information collected from various annual reports of both the sugar mills, statistics published by sugar mills association, data available on the internet etc. and that too for a time period from **2004-2005** to **2008-2009**. Thus, our research work is mainly based upon secondary data.

The researcher had time and monetary limitations too but with the help of his respected supervisor and other well-wishers he was able to complete the research work with utmost satisfaction.

Research Methodology

Research methodology adopted for completion of research work has its great importance, because the quality of results / findings of research work depend upon it. The following research methodology is adopted for the research purposes-

SELECTION OF AREA

Uttar Pradesh is one of the largest states of India and is developing by leaps and bounds day-by-day. Various projects are in the pipeline and many others have already taken a proper shape for the overall development & progress

of this historical state. And, western U.P. is playing an important role in its overall development as integral part of Northern India. This part is famous world-wide for the production of sugar and spreading sweetness throughout the world.

In order to start his research work, the researcher adopted the **lottery system** of selecting two sugar mills from northern India. It consisted of two phases. In first phase, out of total districts of northern India, two districts were selected by lottery system. This resulted into two districts; one was **Meerut** & another **Ghaziabad**. Then in the next phase, out of total number of sugar mills running in these two districts respectively, one sugar mill each from Meerut & Ghaziabad districts were selected, again by the same lottery system. It resulted into the names of **Mawana Sugars Limited** and **Simbhaoli Sugars Limited** respectively.

One of the oldest, established and famous sugar mills i.e. "**Simbhaoli Sugar Ltd.**" has already marked its presence in the world market and the other upcoming name of "**Mawana Sugars Ltd.**" is also speedily paving its way at the world forum. Thus, the universe of the present study is about the management of inventories of these two sugar mills of Northern India.

PERIOD OF STUDY

This research work is primarily based on secondary data. Hence, it was conducted on macro level (i.e. from the financial year 2004-2005 to 2008-2009) and micro level (i.e. financial year 2008-2009).

COLLECTION OF DATA

The strong unwillingness on the part of the management of these two renowned and reputed sugar mills (to participate and aid the research work), made it difficult for the researcher to move in the desired direction most of the times. As a result, this study was turned towards the secondary data collection and is mainly based upon the information collected from various annual reports of both the sugar mills, data available on the internet etc. and that too for a time period from **2004-2005** to **2008-2009**. Thus, our research work is mainly based upon secondary data.

TABULATION, ANALYSIS AND INTERPRETATION OF DATA AND INFORMATION

Data and information collected from different sources were tabulated chapter-wise so as to make the study systematic and scientific. Different tables and charts were prepared for the purpose to concentrate on each and every aspect of this study.

After tabulation of data or information, an analysis of each table was made using different statistical tools so that

relevancy of data collected with the present study might be traced and the reliable conclusions might be drawn.

STATISTICAL TOOLS APPLIED

During the research work, different statistical tools like t-test, mean, least square method, ratios, graphic presentation, chart development etc. were used for the purpose of analyzing the data collected.

HYPOTHESES OF THE STUDY

The hypotheses of the study are as under –

- 1. The stock of stores & spares of Mawana Sugars Ltd. and Simbhaoli Sugars Ltd. are of the same values.*
- 2. The stocks of raw materials, components etc. of both sugar mills are having same values.*
- 3. The Process stocks / stock of Work in progress of Mawana Sugars Ltd. and Simbhaoli Sugars Ltd. are of the same type.*
- 4. Simbhaoli Sugars Ltd. & Mawana Sugars Ltd. is having the same value of stock of finished goods.*
- 5. The production quantity of Mawana Sugars Ltd. and Simbhaoli Sugars Ltd. is almost the same.*
- 6. The sales quantity of both sugar mills is of the same amount.*
- 7. The finished goods stock of both sugar mills is not different.*

8. *The raw materials consumption of Mawana Sugars Ltd. and Simbhaoli Sugars Ltd. is almost same.*

STATE SUGAR INDUSTRY : A BRIEF OVERVIEW

Uttar Pradesh Sugar Industry is one of the largest sugar industries in the Indian economy. The lavish measures in form of new promotional policies for the Uttar Pradesh sugar industry by the state government of Uttar Pradesh was introduced at a time when it was much needed to further boost the growth of the Uttar Pradesh sugar industry. The improvements in the plant capacity and the introduction of new techniques which enables the optimization of the existing plant capacities has the further made the growth definite.

With the new promotional policies of the Uttar Pradesh sugar industry, the investors have already starting eyeing the future prospects. There are 20 more sugar processing units are coming up as a part of Uttar Pradesh sugar industry. The existing companies under the Uttar Pradesh sugar industry are planning an investment pertaining to expansion of about Rs 4,000 crore. At present the major companies in the Uttar Pradesh sugar industry are Balrampur Chini, Bajaj Hindusthan Ltd., Simbhaoli Sugars Ltd., Mawana Sugars Ltd., etc.

The per capita consumption of sugar in 2008-09 was estimated to be 19.9 kgs. annually and it has equal chances of rising further. In the financial year of 2008-2009, India

had to import 28 lakh tons of sugar from different countries due to the huge decline in the national sugar production.

In the present research work we have studied and compared the inventory management of Mawana Sugars Limited and Simbhaoli Sugars Limited. The brief profile of both is as under -

PROFILE OF MAWANA SUGARS LIMITED

Mawana is a city and a municipal board in Meerut district in Uttar Pradesh state of India. In the northeast side of town is Mawana Sugar Works, one of the biggest sugars producing factories in India, which is going to celebrate its golden jubilee in the year 2011-12. The economy of Mawana is based on sugarcane and its products. Sugarcane is main crop of the agricultural land in villages near the town. The farmers either sell their crop to Mawana Sugar Works or produce 'Gur'(raw sugar) out of sugarcane and sell it in the market (Gur-Mandi).

Promoted by Mr. Siddharth Shriram, Mawana Sugar Limited operates three factories in UP aggregate crushing capacity of 29,500 tonnes cane a day (tcd). Of these, two – Mawana (13,000 tcd) and Nanglamal (6,000 tcd) – are in Meerut and the third, Titawi (10,500 tcd), is in Muzaffarnagar district.

PROFILE OF SIMBHAOLI SUGARS LIMITED

Simbhaoli Sugars Limited (SSL), formerly known as The Simbhaoli Sugar Mills Limited (SSML), a 75 years old company is reinventing itself as a growth oriented, innovative and customer facing enterprise. Simbhaoli Sugars Limited (SSL) was established as a partnership firm in 1933 with a 400 TCD (tones of sugarcane crushed per day) sugar unit at Simbhaoli in Western Uttar Pradesh region of India. It was incorporated in 1936 as a private limited company. The company went public in 1989 and has followed a stable growth strategy in its business. In the year 1992 it acquired a distillery and converted its Simbhaoli sugar plant into a sugar complex.

Established by Sardar Raghbir Singh Sandhanwalia in the village that goes by its name, Simbhaoli was one of the earliest sugar plants to be set up in western Uttar Pradesh. Over the years, SSL set industry trends for technology, professional management, product quality, research and innovation efforts, and covenant with farmers, corporate social responsibility initiatives and welfare schemes for employees.

Findings on Inventory Management in Mawana Sugars Limited and Simbhaoli Sugars Limited

As it has already been proved that there is no significant difference between the productions of both sugar mills, therefore, the following analysis is made based on the assumption that the production level of both the sugar mills is same.

In *Mawana Sugars Ltd.*, inventories had four categories viz., stores and spares; raw materials, components etc.; work in progress and finished goods. In case of *Simbhaoli Sugars Ltd.* too, inventories had four classification viz., stores & spares (including tools and appliances); raw materials; process stocks and finished goods.

In case of Mawana Sugars Ltd., the cost of stores and spares was only Rs. 146.51 lacs in 2004-05, Rs.296.48 lacs in 2005-06, Rs.324.53 lacs in year 2006-07, Rs.1295.00 lacs in 2007-08 and Rs.2036.40 lacs in 2008-09. On the other hand, in case of Simbhaoli Sugars Limited, the cost of stores and spares was Rs.710.04 lacs in 2004-05, Rs.950.56 lacs in year 2005-06, Rs.880.09 lacs in 2006-07, Rs.1628.10 lacs in 2007-08 and Rs.1928.67 lacs in 2008-09. Thus, the decision pertaining to investment in stores, spares etc. by Simbhaoli Sugars Limited is better than that of Mawana Sugars Limited because from the very first year

of study period, it has deployed more funds for procuring stores, spare parts etc. which clearly shows its concern about ensuring the smooth running of production process. Though in the last year (2008-09) Mawana Sugars Ltd. deployed more funds in comparison to Simbhaoli Sugars Ltd. which itself is a clear evidence of its increased awareness.

Likewise, Mawana Sugars Ltd. had the stock of Raw materials, components amounting to Rs.112.87 lacs in 2004-05, Rs.261.03 lacs in 2005-06, Rs. 198.46 lacs in 2006-07, Rs.234.07 lacs in 2007-08 and Rs.4,558.10 lacs in 2008-09. On the other hand, the Simbhaoli Sugars Ltd.'s raw materials, components etc. were Rs. 6,664.47 lacs in 2004-05, Rs. 4,910.14 lacs in 2005-06, Rs. 345.88 lacs in 2006-07, Rs. 435.06 lacs in 2007-08 and then rose to Rs. 21,128.89 lacs in 2008-09, which it claims to be on account of better quality seeds provided by it to the supplier farmers. But the other side of the coin shows an altogether different picture. In a bid to check illegal purchase of sugarcane by mills, the state government has directed cane development and excise departments to verify stocks of cane, sugar and molasses or raw sugar at all mills in Uttar Pradesh as some mills were purchasing canes from the farmers at low rates by offering immediate cash payment. Such tactics not only cause financial loss to the farmers, but also results in loss of commission for cane committees and tax to the Centre and the state. During joint inspection by cane and excise department team molasses in excess quantity was detected

in some mills and Simbhaoli Sugars Ltd., Ghaziabad was found to be one of them. Thus, the raw material's inventory management of Simbhaoli Sugars Limited shows that it has blocked its valuable funds in procuring raw materials etc. which could have been otherwise utilized for more beneficial & fruitful purposes.

Similarly, the stock of work in progress of Mawana Sugars Ltd. was Rs.69.35 lacs in 2004-05, Rs.86.53 lacs in 2005-06, Rs. 114.96 lacs in 2006-07, Rs.267.40 lacs in 2007-08 and Rs.396.90 lacs in 2008-09. On the contrary, Simbhaoli Sugars Ltd. had the stock of work in progress as Rs.155.11 lacs in 2004-05, Rs.1,233.22 lacs in 2005-06, Rs. 930.67 lacs in 2006-07, Rs.526.28 lacs in 2007-08 and Rs.870.35 lacs in 2008-09. Thus, the amount blocked in Work-in-Progress by Simbhaoli Sugars Limited is much more than that invested by Mawana Sugars Limited. Therefore, we can say that Mawana Sugars Ltd. is having a better inventory management of its work in progress as it has blocked lesser amount throughout the study period.

And last but not the least, so far as the stock of finished goods is concerned, in case of Mawana Sugars Ltd., it was Rs.154.83 lacs in 2004-05 but then it dipped to Rs.71.56 lacs in the next year 2005-06, then it rose to Rs.107.48 lacs in 2006-07, Rs. 7,079.93 in the next year 2007-08 and Rs.13,433.80 in the last year of study period i.e. 2008-09. But the stock of finished goods, in case of Simbhaoli Sugars Ltd., was Rs.12,337.12 lacs in 2004-05,

Rs.14,166.04 lacs in the next year 2005-06, then it dipped to Rs.8,200.52 lacs in 2006-07, and then rose to Rs. 14,232.88 in the next year 2007-08 and ultimately finished with Rs.19,069.42 in the last year of study period i.e. 2008-09. Thus, so far as the management of inventory of finished goods is concerned, Simbhaoli Sugars Limited must review its policy of maintaining such a high level of finished goods because sugar industry is gradually transforming into regular industry from seasonal one. Therefore, it is not advisable & desirable but is just a futile exercise of blocking valuable funds in finished goods' inventory.

Thus, it is quite clear from the above that Simbhaoli Sugars Ltd. is not following proper inventory policies of its key inventory items viz., raw materials, work in progress & finished goods and there is an immediate need of reviewing its policy. This fact can be easily justified by analyzing the percentage of inventory items to the current assets' figures.

Although the cost of the inventories usually forms a high percentage of Current Assets, but in the case of Simbhaoli Sugars Ltd., this cost was as high as Rs.42,997.33 lacs in the year 2008-09 i.e. around 79.18% of the current assets. It was Rs.19,866.74 lacs in the year 2004-05, i.e. 92.86 % of total current assets. According to financial wizards, ***the percentage of inventories to the current assets should not be more than 60.*** Though Simbhaoli Sugars Ltd. has tried to reduce its inventories' percentage over the time period of five years yet it is still on the higher side.

Thus, the situation in respect of Simbhaoli Sugars Limited is quite alarming.

Though, till now Mawana Sugars Ltd. is having an edge over its counterpart Simbhaoli Sugars Ltd., so far as inventory management of key items like raw materials, work in progress & finished goods is concerned but when we analyze overall percentage of its inventory items to current assets, this cost comes to as high as Rs.20425.20 lacs in the year 2008-09 i.e. 88.07% of the current assets, which was only Rs.483.56 lacs in the year 2004-05 i.e. barely 18.72% of the current assets. This shows a significant increase of about 470.46 % in five years time period. As mentioned earlier, the financial wizards are of the view that the percentage of inventories to the current assets should not be more than 60. Thus, the situation in this respect of Mawana Sugars Limited also needs an immediate review of its inventory policies by the management.

As it has already been proved that there is no significant difference between the sales of both sugar mills, therefore, the following analysis is made based on the assumption that the sales level of both the sugar mills is same.

Although on the whole, in case of Mawana Sugars Limited, there has been an increasing tendency in its sales as well as inventories, but the **percentage of inventories to sales** has also shown an increase, which raised from 0.79% in the year 2004-05 to 19.86% in the last year of

study period i.e. 2008-09. It clearly shows that the stocks, which were once less than even 1% of sales, are now forming around 1/5th of sales. In other words, there is an around 20 times increase in stocks' level and that too within five years. This means blockage of more funds in inventories by Mawana Sugars Limited.

Likewise, in case of Simbhaoli Sugars Ltd., the **percentage of inventories to sales** has also shown an increase from 50.91% in the year 2004-05 to 60.87% in the year 2008-09. This shows an excessively higher proportion of funds blocked in inventories. Thus, by comparing the data of both the sugar mills, it can be easily stated that Simbhaoli Sugars Ltd. had almost 50 times higher inventory percentage to sales in the year 2004-05, in comparison to what Mawana Sugars Ltd. was maintaining in that year, which remain higher even (i.e. three times greater) in the last year (2008-09) of the study period. Thus, the inventory policy of Simbhaoli Sugars Ltd. is of hoarding finished goods in anticipation of price rise and thereby taking advantage of increased prices in the market when the demand reaches its peak, especially during the festive season.

Findings on Inventory Turnover Ratios of Mawana Sugars Limited and Simbhaoli Sugars Limited

In case of Mawana Sugars Ltd., the raw material turnover ratio was 10.69 times in 2005-06, 10.09 times in

2006-07, 162.34 times in 2007-08 and 16.51 times in 2008-09. On the other hand, in case of Simbhaoli Sugars Limited, it was 5.21 times in 2005-06, 9.97 times in 2006-07, 67.60 times in 2007-08 and 4.66 times in 2008-09. Thus, the stock rotation policy of Mawana Sugars Limited is far much better than that of Simbhaoli Sugars Limited, as it has maintained higher raw material turnover ratio throughout the study period.

Similarly, the work in progress turnover ratio of Mawana Sugars Ltd. was 261.44 times in 2005-06, 152.37 times in 2006-07, 366.91 times in 2007-08 and 188.66 times in 2008-09. On the other hand, in case of Simbhaoli Sugars Limited, it was 53.32 times in 2005-06, 41.31 times in 2006-07, 54.58 times in 2007-08 and 90.17 times in 2008-09. Thus, the work in progress turnover ratio of Mawana Sugars Limited is better than that of Simbhaoli Sugars Limited, as it remained higher throughout the study period.

So far as Finished goods turnover ratio is concerned, in case of Mawana Sugars Ltd. it was 180.01 times in 2005-06, 171.48 times in 2006-07, only 19.52 times in 2007-08 and then dipped to 6.11 times in 2008-09. On the other hand, in case of Simbhaoli Sugars Limited, it was 2.79 times in 2005-06, 4.00 times in 2006-07, 3.54 times in 2007-08 and 3.78 times in 2008-09. Mawana Sugar Ltd.'s stock rotation policy is better than that of Simbhaoli Sugars

Limited as throughout the study period MSL has maintained higher finished goods turnover ratio.

Findings on Inventory Holding Period of Mawana Sugars Limited and Simbhaoli Sugars Limited

In case of Mawana Sugars Ltd., the raw material inventory holding period was 1.12 months in 2005-06, 1.19 months in 2006-07, 0.07 months in 2007-08 and 0.73 months in 2008-09. On the other hand, in case of Simbhaoli Sugars Limited, it was 2.30 months in 2005-06, 1.20 months in 2006-07, 0.18 months in 2007-08 and 2.57 months in 2008-09. Thus, the average age of raw material inventory of Mawana Sugars Limited is better than Simbhaoli Sugars Limited, as it remained at lower side throughout the study period. This also shows quick disposal of raw material inventory by Mawana Sugars Limited.

Likewise, the work in progress inventory holding period of Mawana Sugars Ltd. was 0.05 months in 2005-06, 0.08 months in 2006-07, 0.03 months in 2007-08 and 0.06 months in 2008-09. On the other hand, in case of Simbhaoli Sugars Limited, it was 0.23 months in 2005-06, 0.29 months in 2006-07, 0.22 months in 2007-08 and 0.13 months in 2008-09. Here also, the lesser work in progress inventory holding period, throughout the study period, of Mawana Sugars Limited indicates better management of

semi-finished inventory & its efficiency in managing production processes.

Last but not the least, the finished goods inventory holding period of Mawana Sugars Ltd. was 0.07 months in both the years 2005-06 and 2006-07, 0.61 months in 2007-08 and 1.96 months in 2008-09. On the other hand, in case of Simbhaoli Sugars Limited, it was 4.30 months in 2005-06, 3.00 months in 2006-07, 3.39 months in 2007-08 and 3.17 months in 2008-09. Here, Mawana Sugars Ltd.'s lower finished goods holding period reflects a better demand position of its finished goods, as its holding period is far less than that of Simbhaoli Sugars Ltd. It indicates better inventory management of finished goods by Mawana Sugars Limited.

Findings on Trend Values of Mawana Sugars Limited and Simbhaoli Sugars Limited

The yearly increasing trend, in case of stores, spares etc., of Mawana Sugars Limited & Simbhaoli Sugars Limited comes to Rs. 477.83 lacs and Rs.311.48 lacs respectively. Thus, Mawana Sugars Limited is more concerned about smooth functioning of its production process which is clear from its intention of investing more funds annually for procuring stores, spares etc.

The annual increasing trends of raw material, components etc. of Mawana Sugars Limited & Simbhaoli

Sugars Limited are Rs. 886.35 lacs and Rs.2,445.38 lacs respectively. Thus, the yearly trend values of Simbhaoli Sugars Limited clearly show that more funds will be blocked in this segment. Thus it is a matter of worry and indicates an alarming situation. As such, its management needs to review immediately this policy of maintaining such a high level of raw materials inventory. Therefore, we can say that the inventory management of raw materials, components etc. of Mawana Sugars Limited are better than Simbhaoli Sugars Limited.

The yearly increasing trends of work in progress etc. of Mawana Sugars Limited & Simbhaoli Sugars Limited are Rs. 83.60 lacs and Rs.72.35 lacs respectively. Thus, the work in progress inventory management of Simbhaoli Sugars Limited is better in comparison to Mawana Sugars Limited as its annual investment in work-in-progress inventory is lesser than that of Mawana Sugars Limited.

The yearly increasing trends of finished goods etc. of Mawana Sugars Limited & Simbhaoli Sugars Limited are Rs. 3,356.63 lacs and Rs.1,353.14 lacs respectively. As the annual increase, in the invested amount of finished goods inventory, is more in case of Mawana Sugars Limited, its inventory management policies needs an urgent review in order to avoid unnecessary blockage of funds in it.

Findings on Quantitative Trend Values of Mawana Sugars Limited and Simbhaoli Sugars Limited

So far as the production of goods is concerned, the annual increasing trend of Mawana Sugars Limited & Simbhaoli Sugars Limited comes to 31,22,358 quintals and 146,036 quintals respectively. This trend of Mawana Sugars Limited has a possibility of further reaching new heights due to use of more advanced techniques of production, efficient management of waste products, better changes in production schedules, increase in the demand of finished goods due to introduction of better varieties, timely arrival of monsoon, fewer restrictions on imports, lesser or no duty etc. Thus the increasing trend of production shows better management by Mawana Sugars Limited.

Similarly, the yearly increasing trend, in case of sales of goods, of Mawana Sugars Limited & Simbhaoli Sugars Limited, comes to 721,923 quintals and 113,023 quintals, respectively. Undoubtly, this is a good sign for Mawana Sugars Limited's future prospects and shows a better picture of the quality of its marketing strategies, policies and ultimately of management. It shows its determination of grabbing a lion's share in the future global market.

The Mawana Sugars Limited shows an increasing trend of 1,27,023 quintals per year in its closing stock of finished goods but on the other hand Simbhaoli Sugars

Limited shows a *decreasing* trend of 8,006 quintals annually. This shows Simbhaoli Sugars limited's intentions of reducing its investment in closing stock of finished goods and thus utilizing the released funds for other fruitful & productive purposes. Thus, it shows a change in the perspective of its management of striving for better management of finished goods in times to come.

So far as trend in raw material consumption is concerned, it is 72,76,723 quintals per year in case of Mawana Sugars Limited (*which of course is subject to increase in production capacity due to increase in demand etc.*) whereas it is only 4,90,546 quintals per year in case of Simbhaoli Sugars Limited. In other words, Mawana Sugars Limited's raw material consumption is expected to be almost 15 times more. Thus, more consumption of raw materials is a sign of better management which in turn will lead to more production, with an underlying assumption of having more demand for its quality goods.

Findings regarding Hypotheses Testing of both Sugar Mills

These are as under –

(A) *INVENTORY OF STORES, SPARES etc. OF BOTH SUGAR MILLS IS NOT SIGNIFICANTLY DIFFERENT.*

(B) *INVENTORY OF RAW MATERIALS, COMPONENTS etc. OF BOTH SUGAR MILLS IS NOT SIGNIFICANTLY DIFFERENT.*

(C) INVENTORY OF WORK IN PROGRESS OF BOTH SUGAR MILLS IS SIGNIFICANTLY DIFFERENT.

(D) INVENTORY OF FINISHED GOODS OF BOTH SUGAR MILLS IS SIGNIFICANTLY DIFFERENT.

(E) THE PRODUCTION OF BOTH SUGAR MILLS IS NOT SIGNIFICANTLY DIFFERENT.

(F) SALES OF BOTH SUGAR MILLS IS NOT SIGNIFICANTLY DIFFERENT.

(G) FINISHED GOODS CLOSING STOCK OF BOTH SUGAR MILLS IS NOT SIGNIFICANTLY DIFFERENT.

(H) RAW MATERIAL CONSUMED OF BOTH SUGAR MILLS IS NOT SIGNIFICANTLY DIFFERENT.

Suggestions for Mawana Sugars Limited

The researcher found during his course of study that the management of Mawana Sugars Limited needs to pay attention to some of the key areas in order to ensure better management of its inventory:

- a. It is suggested to invest more funds in inventories of stores & spares. This will ensure better maintenance of plants & machineries which in turn ensure smooth and trouble-free production process.
- b. The increased share of inventories in current assets is instrumental to a weak liquidity ratio, especially quick ratio because inventories along with prepaid expenses are considered to be slow moving items / items which cannot be converted into cash

immediately. Thus, Mawana Sugars Limited is advised to reduce its level of inventories and try to bring it to the normally accepted level of 60% of current assets. As the more cost of inventories mean uncontrolled & inattentive inventory policies.

- c. So far as the yearly trend of work in progress is concerned, it is on a higher side, which shows more blockage of funds due to longer operating cycle. Thus, Mawana Sugars Limited is suggested to reduce the length of its production cycle and also the level of funds invested (and thus blocked) in various items of work in progress viz., raw material, labour, direct expenses etc.;
- d. Increasing investment in finished goods, not only in terms of amount but also in quantitative terms, (as it appears from the trend analysis) is a sign of blockage of valuable funds in finished goods. As the sugar industry is getting more relaxations from the government like duty free import of raw sugar etc. which is helping it to reduce its dependency on seasonal crops and thus changing the face of sugar industry from seasonal to a regular industry, so it is advised that the excessive investment in finished goods should be avoided.
- e. Improper arrangements are made for up-keep & safety of inventory items. It came to researcher's knowledge that during shut-down / off-season;

stores, spares & raw materials are not kept under strict vigil though these items should have been checked & verified at regular intervals. Therefore, it is advised that the physical verification of inventories should take place at proper time intervals during the year in order to ensure minimum losses of inventory items.

- f. The management did not fix levels of inventory such as maximum level, minimum level and safety levels of inventories. Therefore, it is suggested to fix these levels invariably in order to avoid further losses.
- g. As Simbhaoli Sugar Mills has taken initiative in providing better quality seeds to the local farmers, in a similar manner Mawana Sugars Limited should also strive to make necessary arrangements for providing better quality seeds, manure etc. to the supplier pageants. This will definitely help in improving the input – output ratio.

Suggestions for Simbhaoli Sugars Limited

Inventories hold quite a sizeable amount of capital invested in an industrial enterprise. Therefore, management of the industrial enterprise should not be ignored or taken lightly. The cost reduction and the maximization of profits policies have a base upon a sound inventory management practice. The researcher found during his course of study that the management of Simbhaoli Sugars Limited is lagging

behind on various fronts, as such it needs to pay immediate attention to the following areas in order to ensure better inventory management:

- a. The investment of heavy amount in the inventory items (like raw materials, work in progress & finished goods) is a clear indication of improper & inefficient management of these inventory items as the funds could have been deployed, in much better manner, for other more useful objectives.
- b. As the inventories have a large proportion of investment in current assets, as clear from the analysis of inventories of Simbhaoli Sugars Limited, it is suggested that this heavy investment in this component of current assets be reduced.
- c. The inventory policy of Simbhaoli Sugars Limited is of hoarding finished goods in anticipation of increased demand of its finished goods in future which in turn will be instrumental to price rise and thus will help it in increasing its profits manifold but this policy is entirely against the social welfare objective of our society. It is suggested that the profits should not be earned at the cost of society at large.
- d. The stock rotation policy, pertaining to raw materials, work in progress and finished goods, needs thorough introspection as it is not up to the

mark. This, in turn, has increased the average age of all these inventory items. So, it is suggested, that the holding period of these inventory items should be reduced to the reasonable & acceptable level.

- e. The yearly trend of stores & spares shows the reluctance on the part of the management of Simbhaoli Sugars Limited of not providing sufficient budget for the maintenance of its plants & smooth running of production processes. It is advised that management must make necessary arrangements of essentially required spare parts & store items in order to make its production processes disturbance free, which would help it in fulfilling the orders of its valuable customers in time.
- f. The yearly trend of raw materials etc. also shows an excessive investment of funds in these items, which shows an unethical practice of purchasing raw materials at cheaper rates from the farmers by making cash payment. In the light of information gathered earlier, it is advised to the management of Simbhaoli Sugars Limited to not to indulge in such cheap tactics. This will ruin its image in the eyes of one and all.
- g. The quantitative trend figures of raw material consumed are also not giving a healthy indication because the lower raw material consumption will lead to lower production and lower production will

result into lower sales ultimately. Thus, it is suggested to the management of Simbhaoli Sugars Limited to increase the level of raw material consumption, as it would help it in capturing not only the local but the global market too because the overall production of sugar, at world level, is falling short of its ever increasing demand.

- h. The management should also streamline the administrative procedure for maintaining the safety stock and must carefully plan the Order Placement schedules.
- i. The management must fix and periodically review the various stock levels i.e. maximum level and safety levels of inventories. This shall help the management for effective control and greater help for achieving the objectives.
- j. Inventory should be analysed as moving and non-moving items.
- k. Reconciliation should be introduced between production, sale and inventory periodically.
- l. Periodical physical verification of inventories will minimize the possibility of theft and pilferage also and give correct valuation of inventories. Time and date of physical verification should be done by persons of various concerned departments in the presence of a responsible officer.

m.To reduce overstocking, the management should gear up the sales department to improve their sales targets and carefully decide the range of sales also.

Though the economy and cost control is an important objective throughout the industry, these mills practiced the smooth flow production policy and gave it a top priority in the management of inventories because of increasing cut-throat competition.

Also, these sugar mills have changed their accounting year one after another. Simbhaoli Sugars Limited has changed its financial year in 2006-07 from April - March to October-September when it compiled its data for 18 months instead of 12 months normal period. Simultaneously, Mawana Sugars Limited changed its financial year w.e.f. 2007-08. The plea which they gave seems to be logical apparently, but when the 18 months data is converted into 12 months data (*in order to be compatible with the other preceding and succeeding years*), it becomes clear that those increased figures of various inventory items, raw material consumed, cost of goods sold etc. were used in order to give better view of their financial position and these companies have used this opportunity for face up-liftment in order to attract prospective investors (i.e. shareholders, bankers, financial institutions, suppliers, customers etc.)

In view of the above analysis, it can be easily said that the inventory management of Mawana Sugars Limited is better than that of Simbhaoli Sugars Limited. The steps to effective inventory management are not something one does only once; rather it is a journey in process refinement. One can start very simply and then drive toward excellence by reiterating this process. With time and practice one can expect the right inventory in the right place at the right time.
