CHAPTER - 2

DESIGN OF THE STUDY
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Survey of Literature

The researcher undertook a study of literature pertaining to sugar industry in order to find out what had already been done in this field and to identify those aspects, which awaited scrutiny. Particulars of reports, books and articles consulted by the researcher are furnished below.

Agarwal (1976) in his study, 'Indian sugar Industry: My Recollections' analyzed various aspects such as phenomenal growth of sugar industry, varieties, payment, relationship between mill owners and labourers, role of co-operatives in the sugar industry, causes for low recovery etc.

Baran (1985) in his study entitled, "Sugar processing Technique in India" has stressed the advantage of small-scale units. He argues that the quality of the product by small scale units is of the same technical standard as average mill sugar. At the same time the small-scale units are labour intensive as compared to large-scale units.

Dattatraguiu (1985) in his article, "Indias Agricultural Export" has stressed the importance of export out-let of sugar in our country. He has pointed out that apart from concentrating on area under cultivation, sufficient attention must be paid to increase the sugar content as well as productivity of sugarcane in the country.
Ram Vichar Sinha (1988) has brought out the importance of sugar industry to national economy and the historical background of the industry in India.

Ram Vichar Sinha (1988) in his article, "Measure for Sugar Industry Development in 1980's and Beyond" stressed the need for orientation of cane development activities and renovation of plant and machinery by modernisation and rehabilitation.

Mssra (1988) in his article Sales Forecasting and Financial Management of Sugar industry has stated that sales forecasting and planning are indispensable in sugar industry where various government controls are in operation. Management is to be more cautious on all fronts to economise the operations and to reduce loss. He has concluded that sales area should not be overlooked under the protective policy of Government control.

Badar Alarn Squba! (1989) in his article titled, "Sugar Industry in Crisis" has analysed the major constraints standing in the way of growth and development of sugar industry in India. He has also given suggestions for attaining stability in sugar industry.

Ramanathan et al (1989) conducted field experiments in calcareous soils at farmers' holdings of Coimbatore district. The study reveals that application of ZnS04 and FeS04 has significantly increased yield of ratoon crop and sucrose content.
Ravindra Thukur et al (1989) in their field study, "Correlation and regression studies on yield and quality parameters as affected by Nitrogen levels in Sugar cane" based on six sugarcane varieties belonging to different maturity groups shows that the yield and its attributes responded positively and significantly with increasing nitrogen doses.

Bhagawat et al (1990) in their study, "Sugar Loss-Known or unknown" reveal the sources of sugar loss during the production.

Kaiaimani et al (1990) in their article, "Management of Sugarcane Smut Disease" have explained how it affects the recovery of sugar. They have also given measures to prevent the disease.

Batiwatila! (1990) in his study, "Weed control studies in Spray planted Sugarcane in Sub-Tropical India" identifies the actual practices which control the weeds effectively and enhance the sugar cane productivity and economic conditions.

Manoharan et al (1990) carried out a study, 'A' New High Yielding Sugarcane Variety Suitable for Cauvery Delta Zone. "The work reveals the peculiar conditions in Cauvery delta ultimately leading to poor growth and yield with reduced quality.

Jeyabal et al (1990) in their field experimental study, "Studies on Drought Management in Sugarcane" highlights the ill effects of drought on sugarcane yield. It also suggests drought management practices to boost the cane and sugar yield.
Niphade (1990) in his article titled, 'Attributing Factors for Higher Sugar Recovery' analysed various factors for achieving higher sugar recovery.

Sharma et al (1990) carried out a study, "Dynamics of Sugarcane Production in Vindhya Plateau of Madhya Pradesh". The study shows that sugarcane area and productivity decreased. It also stressed the need for improved technology, better extension techniques, introduction of low cost technology and over and above there must be increased irrigation facilities.

Durai (1990) in his experimental study, "Studies on Weed Control in Sugarcane" investigated the loss of cane yield due to weed infestation. It reveals the efficacy of herbicides in controlling weeds in cane fields.

Tiwari (1990) in his study, "Different Factors, Responsible for Fluctuation in Acreage and Productivity of Sugarcane in North Bihar" observed that previous acreage of sugarcane and rainfall during sowing months were the important factors affecting the sugarcane acreage.

Nandhagobal et al (1990) carried out a field study, "Performance of Promising Sugarcane clones for Early and Mid Late Seasons" points out that cane yield differs in early seasons and mid-late seasons.

Rejeswar Rao et al (1990) in article "Sugar Industries an Investigation" have analyzed the sugar policy and its impact on sugar industry. They have examined control, decontrol and partial controls, imposed by the Government on sugar industry over the past 40 years and the impact
thereof on various groups involved viz, the farmers, manufactures and consumers.

Mohan Rao (1991) in his study, "Energy conservation Leading to Successful By-Product Industries" suggests the ways and means of utilising some of the by products of the sugar industry and shows the scope for the further development of by product industries in India.

Ashok Kumar et al (1991) in their study, "Effect of late Application of Growth Regulators on Sugars" reveal that application of growth regulators in January altered the physiological status of stubble buds, gave better sprouting and yielded a good Raton crop with more sucrose in cane juice.

Simon Commender (1991) in his article, "Industrial production as a Barrier to industrialization Case of North Indian Sugar Industry", has analyzed the causes for the development of 'Khandhasari' industry at the cost of sugar Industry.

Kathiresan et al (2001) in their experimental study, "Ratoon Performance of Different Genotypes of Sugarcane and Yield Reduction Index under Farmers’ Holdings (1996-98) at Kallakurichi Co-operative Sugar mills Periyasevalai, revealed that clones G85003 and Co86010 performed next to COC 92061 in plant and ratoon crops. They had better ratoon ability with less variation of yield reduction index.
Thirumurugan et al (2001) conducted a field experiment on, "Effect of time of Planting on Incidence of Shoot Borer Chilo infuscatellus Snellen, Yield and Quality," found out that effect of time of planting gives different yield. It revealed that the crop planted in January recorded the highest cane yield, whereas July planted crops recorded lowest cane yield.

Senthsl et al (2001) carried out a study, "Evaluation of Distillery Effluents in the Management of Red Rot of Sugarcane". It revealed that Red-rot disease of sugarcane caused serious concern to the farmers and mills in TamilNadu. The suitability of distillery effuents for irrigating the crop to manage the disease and their impact were investigated.

Joshi et al (2001) in their artical, "Impact of Agriculture Research-Some Evidences," gave a picture about the Sugarcane Breeding Institute Coimbatore which developed several varieties of sugarcane giving 50 percent improvement in sugarcane yield and 0.9 Percentage improvement in sucrose.

Desai (2001) in his article, "Sugar Industry in India" gives a comparative statement of Sugar production and price of sugar in India and the whole world. He also suggests the utilisation of co-products of sugar.
Kumar et al. in their work, "Industry wise patterns of Financing of Fixed Assets by Corporate Sector in India," observed the characteristics which have affected the pattern of financing of fixed assets in the corporate sector, as it is generally contended that long term assets should be financed through long term sources of finance. For this study four industries Sugar, Textiles, Electrical Equipment and cable and general Engineering Industries, were chosen for empirical study.

Dewett et al. (1994) in their Book, "Indian Economics," give an account of the performance of sugar factories and their development under Five Year plans. The Study also provides suggestions for improvement of sugar industry.

Vijaya Kumar et al. (1995) carried out an empirical study, "Demand for Working Capital in Private sector Sugar Industries in TamilNadu". The study deals with the demand for cash inventories, receivables, gross working capital and networking capital. It also states that the transaction working capital balances including cash and inventories vary proportionality or less than proportionality to changes in volume of sales. It explains the effect of capital cost on working capital holdings of selected sugar industries.

Vijaya Kumar (1996) in his study, "Determinants of Profitability-A Firm level study of the Sugar Industry in TamilNadu", points out the determinants of profitability in sugar industry using the technique of ordinary least squares. The analysis shows that the growth rate of sales, vertical integrations, leverages, current ratio and operating expenses to
sales are prominent variables explaining profitability of firms in the sugar industry. The significance of operating expense ratio with a negative co-efficient and vertical integration with positive co-efficient indicates that the firms which are operationally efficient were able to earn more profit compared to the others.

Rane (1998) in his article, "Opportunities and Challenges for Indian Sugar Industry in the 21st Century highlights the achievements of sugar industry to the Indian Economy and target of sugar production in future. The article also underlines the potentialities and the application of established technologies through extension methodology to increase cane yields.

Sreenivasa (1998) in his unpublished doctoral dissertation, "Fixed Capital and Inventory Investments, Dividends and External finance in Indian Sugar Industry", observers about the financial variables viz-flow of net debt as a source of external finance followed by investment allowances, reserves and liquidity, alternatively net profits have been statically significant in the order of preference, each influencing fixed capital investment and less significantly inventory investment. Dividend decisions are largely autonomous of fixed of fixed capital and inventory investment and of external financing decisions, while retained earnings are residual datum.
Gaur (1998) in article, "Economic Liberalisation in India: The potential of Co-operativisation", analyses the pros and cons of private sector and the necessity of co-operativisation of small scale as well as big industries in India.

Samar.K.Datta et al (1999) Analysing the competitive strength of sugar industry in article, "Wither Indian Sugar Industry for the sake of Globalisation or Reassess and Redefine its competitive powers Isn't Indian sugar industry competitive?" unveils the true picture about the global competitiveness of Indian sugar industry and suggests strategies for this industry.

Narayanaswamy (1989) studied the determinants of the capital structure of the Co-operative Sugar mills and Co-operative Textile mills. The author has demonstrated positive co-relation between the cost of capital and leverage. Excessive dependence of the sugar Co-operatives on loans resulted in high level of leverage and consequent high cost of capital leading to poor profitability. He has recommended that the Co-operative sugar mills should reduce dependence on loan finance through liquidity management and plough-back.

Baviskar (1991) in his study, "Indian Sugar: Power to the Peasants", concludes that commercialisation of agriculture through growing sugarcane has contributed to the economic viability of small farmers and that the co-operativisation of the sugar industry has strengthened the economic and political position of cane growers.
Biradar and Patel (1993) in his study of, "Co-operative Sugar Factories in Belgaum District", highlights the process of the growth of co-operative sugar factories in the context of the co-operative movement. The paper examines socio-economic role of the co-operatives in the upliftment of small and marginal farmers. It studies the cost of cane cultivation, net income of cane growers and problems confronting the sugar co-operatives. It suggests remedies.

Vijaya Kumar et al (1996) in their study, "Responsiveness of working capita Management - A case study of TamilNadu Sugar Corporations," reveals that the working capital occupies an important place in financial management. Working capital has acquired a significant and sound position for the twin objectives of 'profitability' and 'liquidity'. Of the components of working capital, inventory and loans and advances are the dominant contributory causes for the galloping increase in working capital. The decreasing trend in long-term funds used for financing the working capital shows that TASCO has to utilise its long term funds more effectively by investing them in fixed assets.

Mohan Mishra (1998) in his article, "Position of Sugar Co-operatives in Delicencing Era", dealt with the various gamut of issues affecting the sugar co-operatives against the back-drop of government's decision to delicense the sugar industry. He says that there is need of the hour is decontrol of sugar industry in its totality on the lines of recommendations of Mahajan Committee.
Chandra sekaran 1998 in his article, "Sugar Industry: Positive role of TamilNadu Government", explains the role of TamilNadu government in managing the co-operative sugar mills, restricting new licensees based on viability and interaction among farmers, mills and Governments.

Krishna Gowda et ai (1999) in his study, "Sugar Economy and India: Withering Co-operative Sector?" have found out that the Indian sugar industry is passing through a difficult phase in terms declining area under cane coupled with liberal licensing for establishment of new sugar factories leading to excess capacity building and underutilisation in the years to come. The authors call for a comprehensive long term strategy, encompassing all aspects of cane cultivation and processing.


Patil et ai (1999) have undertaken an empirical analysis of the, "Break even and Margin of safety of the Co-operative Sugar Factories in Maharrastra". The study concludes that the basic melady of co-operative sugar factories in Maharrastra is very high level, of break even point and low margin of safety, weakening the competitive, strength of the factory which determines its long run survival, especially in the context of the globalisation.
Review of literature on sugar industry reveals massive concentration of erudite efforts on technologies of production of sugar cane sugar and by products and productivity of cane and sugar. There are a few studies like those of Dr. N. Narayanasamy on fixed capital of sugar industry, government policies on licensing and possibilities of exports. There has been no comprehensive research work on the financial conditions of the co-operative sugar mills. Financial health of the co-operative sugar mills is indispensable for their growth, and therefore a study of their financial conditions will yield valuable feedback for planning the future growth of this sector.

Objectives of the study

The present study aims at diagnosing the financial conditions of the co-operative sugar mills in order to evolve remedial measures, if required, for strengthening the finances of these mills. Specific objectives of the present exercise are to

1. study the trends in production, sales and utilization of capital in the co-operative sugar mills
2. measure profitability of these mills
3. evaluate their management of working capital
4. study the pattern of mobilization and use of funds and examine the financial health of these mills and
5. evolve remedial measures as called for by the findings of the present exercise.
Hypotheses

In view of stagnation in yield of cane, rate of recovery of sugar and market, certain hypotheses can be framed

1. Production and sales would not have grown sufficiently to ensure full utilization of investment
2. Profitability would have been weakened by the inadequate scale of operations.
3. Inadequate marketing would have resulted in long storage and collection cycles enlarging the length of operating cycle of working capital and reducing its rate of turn over.
4. Poor profitability would deprive the mills of the possibilities of plough back making them dependent on loans. Also sluggish market would result in growth of stocks sundry debtors and sundry creditors.
5. In view of the above, financial health of these mills may not be sound

Methodology

Sampling

There are sixteen co-operative sugar mills in Tamilnadu. All of them have incurred losses, in the last few years and carried varying amounts of accumulated losses in 1998-99. The researcher computed accumulated per tonne of cane crushed a day in 1998-99 for these 16 factories, accumulated loss per tonne of cane crushed a day ranged from Rs 10,180 with an average at Rs 1,24,030. The mills were divided - one group of ten mills having more than the average 1,24,030 per tonne of cane crushed and another group of i
than the average accumulated loss. A sample of 7 mills consisting of 4 from the first group and three from the second group was chosen by lot. Thus the sample comprised the following seven mills.

**Exhibit 2.1**  
**Sample Sugar Mills**

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Name and Address of the Mill</th>
<th>Capacity TCD</th>
<th>Short name as used in the text</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>I Group</strong> (having more than the average accumulated loss)</td>
<td>2500</td>
<td>Mettupatti</td>
</tr>
<tr>
<td></td>
<td>The National Co-op Sugar Mill B.Mettupatti, Madurai. Dt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Thiruppullur Co-op Sugar Mills, Kethandapatti, Vellore Dt.</td>
<td>1250</td>
<td>Kethandapatti</td>
</tr>
<tr>
<td>4.</td>
<td>The Madurantakam Co-op Sugar Mill Padalam, Kanchipuram.Dt</td>
<td>2500</td>
<td>Padalam</td>
</tr>
<tr>
<td></td>
<td><strong>II Group</strong> (having less than the average accumulated loss)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>The Dharmapuri Co.op Sugar Mill, Palacode, Dharmapuri.Dt.</td>
<td>2000</td>
<td>Palacode</td>
</tr>
<tr>
<td>6.</td>
<td>The Vellore Co-op Sugar Mill Ammundi, Vellore, Dt.</td>
<td>2500</td>
<td>Ammundi</td>
</tr>
<tr>
<td>7.</td>
<td>The Tiruneli Co-op Sugar Mill Thiruvalangadu, Kanchipuram, Dt.</td>
<td>2500</td>
<td>Thiruval</td>
</tr>
</tbody>
</table>
Source of Study

The study has utilised secondary data supplied by the sample sugar mills annual reports and audited statements of final accounts of the seven mills provided information required for the study.

Tools of Analysis

The present study employs analytical tools pertaining to Economics and Financial Management. With the help of wholesale price index, data in current prices have been deflated to the price level of 1989-90 the first year of ten-year period (from 1989-90 to 1998-99) chosen for the study. Data in the study have been reduced to lakhs. Capital output ratios have been estimated for evaluation of utilization of capital. Cubic equation has been used for measuring inter-temporal variations in parameters like production and sales. Besides profitability ratios the study has also used multiple regression analysis for identifying factors influencing profitability.

Operating cycle has been computed for evaluation of the management of working capital. Fund flow analysis has been employed for study of the pattern of mobilization and use of funds. Financial health of the sample mills has been evaluated through application of Z score of Aitman.
Chapter plan:

The dissertation has seven chapters as shown below.

- The first chapter deals with importance of sugar Industry in India and in TamilNadu.
- Second chapter carries review of literature and design of study.
- Third chapter is devoted to business operations of the sample mills—production, sales and capital output ratios and inter temporal variations therein.
- Fourth chapter covers the profitability of the sample mills.
- Fifth Chapter examines the management of working capital.
- Sixth chapter deals with fund flow analysis and Z score analysis.
- Seventh chapter embodies summary of findings and recommendations.
CHAPTER - 2
REFERENCES


34. Ram Vichar Sinha, Sugar Industry in India, 1988, pp.312-332.


