CHAPTER– 2
REVIEW OF LITERATURE
AND
RESEARCH METHODOLOGY
## Section – 1
### Review of Literature

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Review of Literature

2.1.1 Introduction

Review of literature is one of the most important components in the research process. For any scientific investigation, comprehensive review of literature is an essential part. The review of literature is also guide to the researcher to conclude the findings with reference to previous research work in the field of chosen research problem. To develop conceptual framework and to select appropriate design, review of literature is necessary for the study. A number of researchers have worked on the various aspects of sugar industry in different regions and under different set of conditions. The main aim of the specific review of relevant literature is to assist a researcher in designing the problem and determining the methodology during the course of research work. This chapter is reviewed the earlier research studies associated with books, Ph. D. theses, published books, journals, reports, research articles, e-journals, websites and published proceedings of the conference papers etc. related to sugar industry. The reviewed literature have been presented under the six different heads viz. sugar industry in global perspective, sugar industry and its impact, developmental changes in the sugar industry, sugar co-operatives in India, challenges against sugar co-operatives and problems faced by sugarcane growers.

2.1.2 Sugar Industry: A Global Perspective

Vergara (2001) has focused on the importance of the sugar industry and the problems faced by the sugar industry in Mexico through the case study on “Mexican Sugar and Trade”. The author has mentioned that the sugar industry in Mexico is the fifth most important industry for the Mexican economy in both economic and social terms. Sugarcane harvest covered 611 hectares of Mexican territory and employs 2.5 million people mostly from rural areas of the country. There are 12 Mexican states that are engaged in the sugar production with 61 sugar mills. The author observed that the sugar
industry has occupied a very important role in Mexican economy despite entire industry operating at risk. The crisis has reached an unprecedented level. The mills have been facing the problems regarding the repayment of the government loans as well as the payments to the sugarcane growers for their harvest. An additional element in the industry’s crisis is the mills infrastructure that has become obsolete and does not help to maximize production. Another crisis faced by the Mexican sugar mills is “excess sugar” which could not be exported to the United States because the USA has not fulfilled the North American Free Trade Agreement, (NAFTA) agreement on sugar and thus, the mills are left with tons of sugar in their warehouses without any buyers. The loss is unquantifiable and the industry will need more than a restructuration to bring it out of 90 years crisis. The author has also concluded that the government has been left with a great challenge, of restructuring the industry while providing for those 2.5 million people that depend on the industry for their livelihood.

Rao (2005) has compared the performance of the sugar industry of the seven countries viz., Brazil, India, Thailand, Mexico, Australia, South Africa and Argentina during the year 2002-04 in his article “Comparative Performance of Cane Sugar Industry in Seven Countries”. These seven countries were selected for a comparative study of sugarcane and sugar production, consumption and exports. The study revealed that amongst the 83 cane sugar producing countries in the world, India is the second largest producer of sugarcane and sugar. The author also mentioned that in the 1980’s India was the world's largest producer and has the largest number of sugar mills. The author point out that every sugar producing country has a strong reason to convert sugarcane into sugar and molasses to earn foreign exchange. The author further concludes that it was more economical to convert sugarcane into sugar and molasses and to use molasses as raw material for
production of ethyl/alcohol. The economies of these activities will however, largely depend on the international price of sugar, molasses and ethyl/alcohol.

Weragoda (1997) while studying “Sugar Industry: Development, Trends and Challenges in Sri Lanka”, the author indicated that for sugarcane cultivation availability of suitable land was very limited and cost of establishing new factories was very high, so, these two factors were obstruction to the expansion of the sugar sector in Sri Lanka. Nevertheless, development of the domestic sugar industry would provide a platform to generate the employment opportunities in the country, not only that but it may also be in saving helpful to save foreign exchange to a great extent. It was found during the analysis that the Sri Lanka would continue to be a market for sugar producing countries.

2.1.3 Sugar Industry and Its Impact

Khote and Kamala (1966) had published a research paper entitled “The Role of Agriculture Processing Industries in Economic Development: A Case Study”. The main aim of this paper was focused on the feedback effects of the sugar industry in Mandya taluka of Mysore. In this study they observed that the area under sugarcane had increased more than the area under any other crop. It has observed a continuous increase in the cash income of the farmers due to adopted improved methods of cultivation. They concluded that the establishment and expansion of sugar factory has further led to the establishment and expansion of the allied industries.

Malayadri (1975) has stated in the article on “Socio-Economic Impact of Sugar Co-operative” that there has been positive impact observed on the pattern of sugarcane cultivation. The researcher has studied how the sugar co-operatives affect to mobilizing rural savings, to generate employment opportunity in the rural area, labour welfare, irrigation facilities and overall development of rural area. The author concluded that the
sense of consciousness among peoples at all the levels has been affected due to the co-operative sugar factory.

**Tupe (1980)** in his paper, “The Impact of Sugar Factories on the Rural Economy- A Case Study” has discussed in detail the impact of the Sanjivani Co-operative Sugar Factory in Ahmednagar district. The study analysed the impact of sugar co-operative on agriculture, on the agriculturists and the agricultural labour, economic condition of the factory workers as well as overall economic development in the rural areas. The author concluded with the findings that area under irrigated land and sugarcane cultivated area have been increased. The study has also revealed that farming method and cropping pattern have changed. Development of agro based industries; developed the agriculture sector. The real income of the farmer has increased and the author had concluded that due to the establishment and development of sugar co-operatives the real income has increased of the farmers.

**Baviskar (1980)** worked on “The Politics of Development: Sugar Co-operative in Rural Maharashtra”. The study describes the economic, social and political background to the emergence of the co-operatives in general and sugar co-operatives in particular with special reference to the Kisan Co-operative Sugar Factory, located in rural area of Kopargaon taluka in Ahmednagar district of Maharashtra. The author believed that sugar co-operatives as instruments of rural development, and the politics of co-operatives are the subjects of detailed analysis. In this book the formal and informal structure of Kisan factory is described and the relationship between the factory and other power structures is analysed. The study is based on initial fieldwork in 1963-64 and subsequent field trips to the area. The work concludes with discussion of some of the problems associated with the co-operatives (eg. corruption and domination by technocrats and government
bureaucracy). It is argued that sugar co-operatives in Maharashtra have largely overcome such problems.

**Mane (1981)** has stated that sugar co-operatives have played an important role in accelerating economic improvement of the farmers in the article entitled “Technological, Socio-Economic and Political Impact of Sugarcane Co-operative of Rural Maharashtra”. The author has also noticed that there has been significant increase in the level of farmers income, saving, and investment mostly in the productive assets and possession of farm machinery. Sugar co-operative has positively affected rural employment.

**Venkaiha (1987)** conducted a study entitled “Impact of Agro-based Industries on Rural Economy – A case study”. The author has systematically studied the changing patterns of employment, occupations, wage, income, and migration etc. in the rural areas because of the setting up of agro-based industries. It is a partial study of the sugar mill in some selected villages of Andhra Pradesh along with other agro – based industries. He came to the conclusion that the setting up of agro-industries resulted in the creation of substantial additional employment in the farm sector. It was also found that these industries created significant changes in the occupational pattern. Finally, he concluded that the impact of the agro –based industry on rural economy was quite substantial because, it is basically labour intensive in nature. So such mills should be developed on a priority basis compared to other non-agro-based industries.

**Jadhav (1991)** examined “The Socio-Economic Impact of Six Sugar Co-operatives Factories in Satara District of Maharashtra” during 1982 to 1989. The objectives of the study were to examine the growth of sugar industry during the reference period in Satara district; to examine the total fund raised as share capital; to estimate the employment generation; to examine the cost of production and price; and to examine contribution of these sugar mills to rural development. The research report revealed that the number of
co-operative sugar factories had increased in the region: the socio-economic growth has been taking place in Sahyadri; the sugar industry generated employment; and they contributed considerably to the rural development.

Parmar (1998) his Ph.D. thesis entitled “The Growth of Co-operative Sugar Industry and its Impact on Rural Economy with Special Reference to the Mahuva Sugar Factory in South Gujarat Region”. The study examine the growth of co-operative sugar industry and its impact on the agriculture sector, sugarcane growing farmers, transport sector rural employment occupational migration of the factory workers and the standard of living of the non-agriculturists. The researcher concluded that the Mahuwa co-operative sugar factory has been rendering considerable socio-economic service to the rural community. The factory has also encouraged political consciousness among the tribal people through democratic process of election. Lastly, on the basis of findings the author mentioned that sugar co-operative obviously played a key role for upliftment of rural economy.

Sirohi (2005) has studied the “Status of Co-operative Sugar Industry in India -Past, Present and Future”. This research article describes the status of the co-operative sugar industry in India during the periods 1936 to 1950, 1951 to 1985 and 1986 to 2005. During these periods the sugar co-operatives underwent major changes. The author has given some recommendations like rehabilitation and modernization should be implementing to improve economic position of sugar factory, proper utilization of by-products, appoint skilled manpower, cost effective solution, promote research and development etc. for improving the health of sugar industry.

Pandey (2007) has explained in his article “Indian Sugar Industry – A Strong Industrial Base for Rural India” that the sugar industry has a lion’s share in accelerating industrial process and bringing socio-economic changes in the underdeveloped rural area. The main aim of this paper is to review the progress of the sugar industry in India, understand its
problems and challenges in context of ongoing liberalization process. The author has mentioned that sickness in the sugar industry has reached an alarming proportion. Mounting losses and decreasing net worth some sugar factories have been responsible for the prevalence of sickness in the sugar industry. The study concluded with some important suggestions like a sugar factory should establish a by-product utilization plant, research Programme should be undertaken in the area of sugarcane cultivation, enhancing sugarcane productivity and sugar recovery, price of sugarcane can be fixed on basis of sugar recovery.

Author has also mentioned that the Indian sugar industry can be a global leader provided it comes out of the vicious cycle of shortage and surplus of sugarcane, lower sugarcane yield, lower sugar recovery, ever increasing production costs and mounting losses. It needs quality management at all the levels of activity to enhance productivity and production. Attention is required on cost minimization and undertaking by product processing activities.

Nagarajan et. al (2012) has studied on “Sweet Responsibility – CSR issues in Indian Sugar Industry”. The purpose of the study was to contextualize CSR in Indian sugar industry. The potential for CSR in developing counties automatically calls for a greater role of large business in addressing the issues faced by the societies they operate in. this report highlights the international standards and guidelines for CSR, CSR in India and other countries, value chain of sugar industry, sugar policy, role of NGOs in sugar industry and CSR issues in Indian sugar industry. The survey indicated that many sugar factories in India actively contribute to the social and economic development of the communities in the form of CSR activities viz. education, health care, infrastructural development, preserving environment, promote sports activities etc. Lastly, the report
formed on some issues relating to CSR in Indian sugar industry i.e. environmentally implicating issues, water related issues, socially implicating issues, functioning issues.

Ahmad and Abuzar (2015) studied on “Problems of CSR in sugarcane value chain in U.P.: An Analysis through Interpreted Model of CSR.” The purpose of this study was to conduct triple bottom line assessment of sugarcane value chain and suggest alternatives that could improve the current sustainable practices of CSR across various stakeholders. The author also used value chain approach to identify the issues related to social, economic and environment across various stakeholders linking the sugarcane produces and the processors. The author has concluded that the sugar mill should play a responsible role towards their employees, shareholders, suppliers, consumers and community. Lastly the study made some recommendation in regards to economic, social and environment sustainability.

2.1.4 Developmental Changes in the Sugar Industry

Mittal (1976) has studied “Rehabilitation and Modernization of Sugar Factory”. He has recommended that to improve the economic position of a sugar factory, rehabilitation and modernization should be adopted. He stated that economies of a sugar factory can be improved by adoption of new techniques to reduce losses of sugar, labour saving devices, fuel saving devices, addition of preventive maintenance techniques, reduction in stores consumption, utilization of by products and expansion of capacity.

Mohite (1976) stated in his article “Productivity of Sugarcane Changing Pattern” that, the rapid growth of sugar industry has been helpful to a great extent in stabilizing sugar production and in reducing chronic shortage of sugar in the country. The co-operative form of organization has lent itself a powerful instrument in the development and mobilization of natural human and financial resources of the state in the sugar industry
and has helped in reducing the backwardness of the country by improving the socio-economic conditions of rural areas in the state.

**Pawar (1977)** has studied on “Co-operative Sugar units in Maharashtra –Economies of Scale”. The author has found that the per unit profitability of sugar production was low in the large sized factories as compared to the smaller ones. The large sized factories, however, were at advantage in economizing manufacturing expenses and overhead costs provided the sugarcane price and excise duty remained the same for all the factories.

**Rao (1980)** has discussed his views through the article on “By-product Utilisation in Sugar Industry”. The author has rightly pointed out that at the current international prices of sugar and molasses, every sugar producing country has a strong reason to convert sugarcane into sugar and molasses to earn foreign exchange required for keeping up the balance of trade. It may be even economical to import crude oil from the foreign exchange earned by export of sugar and molasses. However as the international price of sugar is fluctuating widely and for reducing the dependence on other countries for import of crude oil gradually for political reasons, the sugar producing countries may have to convert the molasses into alcohol and also consider the possibilities of converting a part of the sugar juice into alcohol. The author further concluded that it was more economical to convert sugarcane into sugar and molasses and to use molasses as raw material for production of ethyl alcohol. The economies of these activities will, however, largely depend on the international price of sugar, molasses and alcohol.

**Pathak (1981)** in his research paper work with the title “Sugarcane as an Energy Crop for Punjab” has argued that in view of the current shortage of sugar and the relative pricing of sugar and alcohol, it is not practicable to either grow sugarcane for alcohol production or to divert more sugar for the production of power alcohol. The escalating petroleum prices and its global shortage can create economic compulsion in future to put
more areas under sugarcane so that large quantities of power alcohol can be produced.

**Singh (1984)** had delivered a lecture on “Automation in Sugar Industry in Punjab”. He has concluded that it is easy to see that there is enough scope for improving the efficiency of the sugar factories by introducing instrumentation and controls. However, it is very important to have the right maintenance staff for maintaining instruments in working order otherwise the investment would be lost. An erratic instrument is more dangerous than no instrument at all. Hence, it is imperative that instruments engineers and mechanics are recruited and trained. There is a lot of resistance when any new thing is introduced anywhere, this is only to be expected. It is for the top management to support and nurture all modernization returns, so as to increase factory efficiency and productivity.

**Venkatraman (1985)** had delivered a lecture on “Achieving Uniform Recovery Throughout the Season” during a seminar at Bangalore in which he concluded that increase in the sugar production reduces the cost of production of sugar which will ultimately lead to profitability of the mills and at the same time make the farmer get a good price for his cane, for this it is necessary that the difference between the peak period recovery and the average recovery for the season should be brought to the minimum which is possible only if the recoveries during the early part and the late part of the season are improved. Various methods towards achieving the goal are the part played by the variety, its inherent nature, manipulation of the age of the crop at harvest, selective harvesting, timely application of fertilizer, water management, etc.

**Bargir (1990)** studied the measures adopted for increasing sugarcane production at R.P.S.S.K. Ltd. during 1982 to 1989 and have described them in his article on “Measures Adopted for Increasing Sugarcane Production at Rajarampur Patil Sahari Sakhar Karkhana Ltd., Rajarapmpur Taluka of Sangli District in Maharashtra”. The main
objectives of the study were to find out what are the measures adopted by the mill to improve cane production and to assess impact of these measures on sugarcane production. The primary data was obtained from the agriculture department of the mill during the study period. The mill had taken several measures to improve the sugarcane production viz., distribution of quality seed; trails of new varieties; lectures, seminars and conferences for farmers; development of selected farms; water supply scheme like irrigation, new pipe lines, bore wells, sprinklers, drip irrigation and water management; infrastructure fertilizers like road soil testing and mobile labs; protection measures to members such as supply of fertilizers, press mud, transfer facilities, subsidy to the small holders and demonstration of the new methods.

Mahadik (1991) had undertaken a micro level analysis on “The Economics of Molasses based By-Products of Co-operative Sugar Factories in Kolhapur, Satara, Sangli and Solapur Districts” of Maharashtra State, during the period from 1975 to 1989. His main objectives were to analyze the cost, income and utilization of by-product and to examine employment generated by the selected units. The required data were gathered from the records of the factories, Excise Department and the Government offices. The study revealed that the bagasse and molasses constitute the main by-products of sugar industry and the utilization of the by-products affects the processing cost of the sugar. The study concluded with a suggestion that every sugar factory must utilize its by-products effectively to reduce the total cost of the sugar production.

Nikam (1995) has analyzed the composition of various cost elements and their magnitude in the total cost of sugar production, and also cost and productivity trend in the co-operative sugar factories in Solapur district of Maharashtra State for the period of 1987 to 1993 in his article on “A Study of Managing Cost And Productivity of Co-operative Sugar Industry in Solapur District”. The study revealed that rapid growth was observed in
the co-operative sugar industry. Post-independent period was dominated by the co-operative sugar sector. The sector's total sugar production and average crushing capacity increased from 800 TCD to 5000 TCD; capacity utilization gone up from 94 per cent to 131 per cent and average sugar recovery increased from 9 per cent to 12 per cent during the study period. The booms in the said industry fetch an attractive return to the cane growers. A notable conclusion made by researcher that over dependence on loan and deposits may hamper the sugar sector in future and cost consciousness is yet to be popularized among these mills. With the help of structured questionnaire primary data was collected and analysed. The secondary data was obtained from the seven sugar mills in co-operative sector from Solhapur area which comes under 'drought area', Out of the seven, only three expanded their capacity. The duration of crushing ranges from 100 to 128 days and the average recovery rate was 10.68 percent.

Mizerska (2000) has studied “Utilization of Sugar Industry Waste in Agriculture”. The study revealed that provisions of several recent environmental laws enacted in Poland have influenced the waste produced by the sugar industry. Chemical analysis showed that various types of waste produced by the sugar factories can be used for soil improvements. This waste includes sediments from the fermentation process and from waste water and soil washed of harvested sugar beet.

Patil (2000) has published his study entitled “Performance, Evaluation and Management of Co-operative Sugar Factory in Tasgaon Taluka – A Case Study”. The author has suggested that efforts should be made to motivate the farmers within jurisdiction under cane development activities nurseries at factory site be expanded so that the seed of high yielding variety will be made available to the cultivators. The inputs like fertilizers are provided by the factory at appropriate time and required quantity. Finance for this purpose should also be provided and factory management should maintain the number of
labourers in the factory according to the government norms. It will reduce the expenses on wages and salaries and other activities.

Pant et. al (2005) had conducted research on “Sugar Industry Diversification For Value Addition”. They have examined various processes of the refined sugar production followed by the Indian sugar industry and also made an attempt to explain the efficient manner of by-products utilization. The concluding remark was that if the by-products of the industry were utilized properly the cost of sugar production could be reduced.

Bhatnagar (2005) has worked on “Increased Renewable Energy Production Through Improved Boiler Efficiency and Judicious Use of Bagasse in Co-operative Sugar Factories”. The study summarized many research works done by various institutions on co-generation of electricity from the huge quantity of bagasse. The studies conducted by Tata Energy Research Institute (TERI), indicated that 5200 MW of power could be generated through the use of co-generation in sugar factories in India. Hence, there was a need of modernization of Indian sugar industry.

Pawar et. al (2005) has examined through their article on the Benefits of “Adopting Improved Production Technology in Sugarcane Farms of Western Maharashtra”. The investigators approached 270 sugarcane growers during 2002-03 to assess the degree of knowledge about improved production technology of sugarcane farms. The survey revealed that 25 percent of the farmers were not aware of the techniques.

Ramaswamy et. al (2006) in their study “Sugar Industry – A Scope of its By Products as Crop Nutrient and Energy Management” have used secondary data to analyze the effective utilization of by-products. Indian sugar industry produces by products in the forms of Bagasse (45 Million MT), Press mud (5 Million MT) and Molasses (7.5 Million MT) per year. There were 285 distilleries which produced 2.7 billion liters of ethanol by
utilizing 7.5 million MT of molasses during 2005-06. The authors have made the concluding remark that the large quantity production and higher amount of sugar export on regular basis may provide incidental added value to the sugar sector and may enable setting up of large sugar complexes that can produce clean energy in the form of ethanol and power besides sugar.

Shrivastav et. al (2012) have presented their views in their article on “Strategies for Sugarcane Improvement in India”. The main objective of this study was to focus on various problems faced by the farmers regarding sugarcane production and sugar productivity. They observed that various problems like natural challenges, labour problems, sugar recovery, and decline in sugarcane acreage, cultivation method, prevailing invasive insect – pests and diseases etc. resulted in declining factor productivity and tendency of the farmers to quit farming. They have provided some remedial measures to solve the above mentioned problems. The study suggested that farmers should adopt organic sugarcane farming, and to reduce labour problem they have to increase the use of various equipments. For improving sugar acreages cultivation of the denotified varieties should be discouraged and the seed cane of high yielding / high sugar improved varieties suitable to various agro-climate conditions should be made adequately available to the sugarcane farmers.

2.1.5 Sugar Co-operatives in India

Shirodkar (1967) has worked on “Co-operative Movement in Kolhapur District”. The objective of this study was to analyze the impact of co-operative sugar factories on the agriculture sector of the Kolhapur district. The study indicated that the agriculturists received various inputs from these co-operative sugar factories. The author has concluded that increasing in the sugarcane production was a result of stable agricultural income received by sugarcane growers through reasonable and guaranteed price provided by the
co-operative sugar factories in surrounding area. The co-operative sugar factories play an important role to boost up the rural economy, in this context, the author suggested that to strive for the development of backward areas co-operative sugar factories should be established.

Jain (1987) has revealed through his article on “Sugar Development Fund”, that a large number of joint stock sugar mills are concentrated in Uttar-Pradesh. The study revealed that about 40,000 cane growers had small land holding and constitute a significant segment of the rural population supplied cane to sugar mills. In compare to this the proportion of the sugarcane growers was much smaller in Maharashtra and Gujarat, where the sugar industrial units were mostly developed in the co-operative sector. In these two states on the priority basis short term loan has provided for the cane development to the cane growers. It has to be concluded that priority should be given to small land holding sugarcane growers who largely concentrated in economically backward areas.

Sinha (1988) has studied the economics of sugarcane, problems of cane marketing and transport, technical performance, utilization of by-products, labour relations and policies on sugar economy in his book “Sugar Industry in India”. Simple tabulation method is used to analyze the data for the period from 1979-80 to 1983-84. The study revealed that the sugarcane development activities were not efficient, effective plant modernization and effective infrastructure developments were not undertaken, utilization of by-products was yet to introduced in the sugar mills and the work force had yet to get proper wages.

Hilage (1989) has worked on “Performance of Sugar Co-operative Factories in Southern Maharashtra”, and analysed the growth of sugar industries in India in general and the co-operative sugar sector in Maharashtra in particular. The main objective of the study was to evaluate the performance of two selected units situated in southern Maharashtra and to
study the top management style and environment of the organization for the period 1976 to 1986. It is a case study of two units; the stratified random sampling was used for selection of farmers and members from 50 villages of the study area. The opinions of the middle level management were obtained through personnel interview. The study revealed that the Co-operative Act 1904 played a significant role till 1947 in the sugar industry. But the co-operative sugar sector suffered from financial weaknesses, lack of professionalism, under developed marketing system and the low production of sugar.

Patil (1991) his Ph.D. thesis entitled “The Study of Co-operatives Sugar Factories in Bleguam District”. The study examines the process of growth of co-operative sugar factories in the context of co-operative movement. The author discussed the structure and working of sugar co-operative during the period 1975 to 1985-86. The study also evaluated the cost of cane cultivation, net income of cane growers and the various problems confronting the sugar co-operatives. The objectives of the study were to study the growth, problems, structure, working and socio-economic impact of co-operative sugar factories; role of sugar co-operatives in uplifting of small and marginal sugarcane growers; to compute the cost of sugarcane cultivation and net income of sugarcane growers. Both primary and secondary data were compiled; the primary data were gathered through the structured questionnaire. The study revealed some problems that there was low yield of sugarcane, instability in the sugarcane supply and price, high cost of production; delay in payment of farmers' bills and had observed utilization under by-products (bagasse, molasses and press mud) within the region.

Waghmare et. al (1993) have studied the “Performance of Shri Chhatrapati Co-operative Sugar Factory, Bhavaninagar (Pune)”. They have concluded that there was increase in the area, production and recovery percentage of the sugarcane in the jurisdiction of the sugar factory. The sugarcane produced by the members constituted around 70 per cent of the
total sugarcane crushed by the factory and remaining 30 percent of the total cane crushed was brought from outside of the operational area of the factory to have full utilization of the installed capacity. It resulted in low cost of production of sugar and better prices for sugarcane to the members.

Pruthi (1995) has studied the “History of Sugar Industry in India”. The study has focused on the history of sugar, sugar making in ancient and medieval India, during British period and after independence till 1992. The consolidated chronological write up backed by secondary data, which was collected from the Government records and books. The study concluded with remarkable findings that the English trader brought sugarcane at Agra and Lukhnow to meet the growing sugar needs of the British Empire; the manufacturing of sugar was intensified by the East India Company; dominance of small size units in the initial phase of the growth of the sugar industry and the existence of major regional difference in the size of sugar mills in India; and after the independence the growth of sugar industry was adversely affected by a variety of factors such as control, cane price, quota, duty and sugar politics.

Anonymous (2010) showing the district wise Area, Production and productivity in Gujarat state. The triennium average area of 2007-08 to 2009-10 was 207500ha. Among them approximately 91 per cent area i.e. 188500 ha covered by South Gujarat. The total production of sugarcane of Gujarat state was 1466900mt. Among them 1326600mt sugarcane is produced only in South Gujarat (90.44%). The average productivity of sugarcane during these years was 70.68t/ha. The average productivity of sugarcane in south Gujarat was 70.29t/ha.

Kalola et.al (2009) estimated the growth and level of instability in area, production and yield of sugarcane crop of different region of Gujarat. The District wise time series data on area, production and yield of sugarcane of the state were collected from the
Directorate of Agriculture, Gujarat State, Gandhinagar for the period from 1960-61 to 2006-07. Analysis was done period wise (1961 to 70, 71 to 80, 81 to 90, 91 to 2000, 2001 to 2007 and 1961 to 2007) for five different regions of Gujarat state (Saurashtra, North Gujarat, Middle Gujarat, South Gujarat and Kutchh) and Gujarat as a whole. The results for growth rate of area, production any yield of sugarcane was found positive and significant in the period 1961 to 1970 for the Saurashtra region and 1961 to 2007 for the Middle Gujarat region. The growth rate of yield was found positive and significant in the period 1981 to 1990 for North Gujarat. The result of growth rate for area and production was noticed positive and significant in all periods except 2001 to 2007 for the South Gujarat region. In the Kutchh region, the growth of yield was found positive and significant in the period of 1981 to 1990 and 1961 to 2007. The results for Gujarat state indicated that positive and significant growth rate of area, production and yield of sugarcane was noticed in almost all the periods except 1981 to 1990 for area and 1991 to 2000 for yield. The results for the instability index for area was found lowest (4.82) in the period 1991 to 2000 for the Gujarat state and the highest (105.05) in period 2001 to 2007 for Kutchh region. For production, it was found lowest (3.73) in period 1991 to 2000 for North Gujarat region and the highest (104.82) in case of 2001 to 2007 for Kutchh region. The instability index for yield ranged from 3.90 (1961 to 1970) for Gujarat state to 31.77 (1961 to 2007) for North Gujarat region.

Tamilselvi (2012) has explained the Indian scenario in sugarcane and sugar production during 2001-2010 in the article on “Tamil Nadu Leads the Way Towards Higher Yields”. The author focused on India’s share in global sugar production. The researchers also studied the share of Indian states in the area under sugarcane cultivation and sugarcane production. On the basis of analysis the study concluded that Tamil Nadu ranks fourth in area under cultivation and sugar production. The author mentioned that Tamil Nadu stood
first with the highest yield among all the Indian states. It showed that even a smaller area under cultivation can produce high yields through better productivity. Lastly, the author recommended that use of high yielding varieties of sugarcane, providing planting materials on time, encouragement to the organic sugarcane cultivation, strengthening of agricultural research and ensuring timely harvesting may improve sugarcane cultivation in study area.

**Patel (2012)** has mentioned announced at the annual meeting of National Federation of Co-operative Sugar Factories Limited (NFCSF) that the year 2011-12 has indeed been a “sweet” year, because there was surplus sugar production with an increase of 30 percent. He had also mentioned that the area under sugarcane had also increased to 50.99 lakh hectare which was a result of the timely payment of sugarcane price during the year 2010-11. He also discussed some recommendations that have been presented to High Power Committee appointed by Hon’ble Prime Minister of India and headed by Dr. C. Rangarajan, Chairman of Economic Advisory Council to the Prime Minister to look into the issues relating to de-regulation of the sugar sector. He has also mentioned that the government had considered the NFCSF request and was likely to reduce the levy sugar obligation to 5 to 7 percentage against 10 percent during 2011-12 seasons.

**Jaya (2012)** in her study entitled “Growth and Development in Indian and World Sugar Industry”, had focused on the role of Indian sugar industry in the world sugar market. She had also discussed the sugar market characteristics, global sugar trade, and sugar policy in the context of the Indian sugar industry. She mentioned that India is the only country in the world that produces plantation white sugar. All other countries are producing either raw sugar or refined sugar or both. India ranks first in terms of the number of mills with 448, followed by china 241 and Brazil 231. India’s six states i.e. Uttar Pradesh, Karnataka, Gujarat, Tamil Nadu and Andhra Pradesh are contributing more than 85
percent of total sugar production in India. She has also indicated some challenges and problems faced by the developing countries in the world sugarcane market. Finally, she has concluded that sugar industry needs more competitive edge which can be given by way of modernization, enhancing productivity and manufacturing excellent quality sugar at competitive prices. Most of the sugar units do not have by product utilization plants. Projects based on bagasse and molasses should be initiated. Ethanol alcohol and paper projects have tremendous scope of development in India. In future, 10-15 percent ethanol may be allowed to be blended with petrol. Research programme should be undertaken in the area of sugarcane cultivation, enhancing sugarcane productivity and sugar recovery. She has also suggested that sugarcane prices should be fixed on the basis of sugar recovery. Attention is to be given to manufacturing quality sugar as per international standards at competitive prices.

### 2.1.6 Problems Faced by Sugar Co-operatives

**Thaper (1976)** has worked on “Way in Sugar Industry Sick” in the context of the sugar co-operatives of Maharashtra. The author mentioned some of the particular features of the sugar industry like the sugar industry is seasonal industry, duration of season, sugar content in cane, its recovery level as well as capital investment have varied from factory to factory and year to year. Apart from the problem of cyclical nature of production of sugar, the author has also observed some other problems faced by the sugar industry like variations in capital investment and sugar recovery, interstate difference in the per unit cost of production of sugar etc.

**Shinde (1981)** has explained the problem of sickness in Maharashtra sugar co-operatives in his article entitled “Sick Sugar Factories”. The author has stated that the escalation in the cost of plant, machinery and civil workers has been a major source of sickness. It has observed that a newly established co-operative sugar factory requires 5 years to break
even, and till that time it incurs annually a loss of Rs.25 to Rs.40 lakh. The losses accumulate rapidly due to high interest rate and the 50 units fall sick.

Anonymous (1983), In 1980 the Government of Maharashtra appointed a committee under the chairmanship of Gulabrao Patil, the Reform Co-operator, to study the problems of the sickness of co-operative sugar factories in Maharashtra. This committee submitted its report in 1983 and made various recommendations to the Government to overcome the problem of sickness of the co-operative sugar factory in Maharashtra. The committee had recommended that state government should give financial help to the sick sugar factories in the form of exemption in the cane purchase tax and should also take effective steps for cane development. The committee identified the sick co-operative sugar factories from Maharashtra and the reasons of the sickness and made the recommendations to solve the problems of these factories.

Hinge (1984) has studied the “Problems of Sick Co-operative Sugar Factories in Maharashtra”, and has recommended that the overall inefficiency in managing the sugar production activity is the root cause of the phenomenon of sickness in the co-operative sugar industry. The researcher has suggested that suitable as well as punishable measures may be advocated in order to control the present practices of mismanagement in the co-operative sugar factories.

Srinivasan (1985) has published a paper entitled “Sickness in Sugar Industry Causes and Remedies - A Management Approach”. In this paper, the author has concluded that it is a sad and ironic fact that the rapid growth in the country’s sugar production and consumption instead of bringing buoyancy has crippled the viability of many units; the chief villain of sickness is the lack of objectivity on the part of parameters. Managerial deficiencies have multiplied the misery.
Patel and Ashturkar (1992) explained various reasons behind the sickness of sugar industry in Marathwada in their article entitled “Scope and Performance of Sugarcane in Marathwada Region”. They observed that due to the lack of adequate cane supply, the factory had purchased the cane from non-shareholders either within or outside the jurisdiction. According to the authors various factors were responsible for underutilization of the factory namely the loss of working hours due to cane shortage, mechanical and electrical failures etc. They also pointed out that the levy sugar price policy was the major reason for reduction in the profit.

Chauhan (1993) has indicated in his article “Problems and Prospects of Co-operative Sugar Mills in Gujarat” problems with regards to managers and workers, the problem of purchase tax on sugarcane based on its prices, shifts in governments’ licensing policies of sugar factories, shortage of sugarcane molasses storage and distribution, efficient disposal and by product utilization, delay in cane payment for cane and the low sugar recoveries per hectare.

Sarogi (1996) has published a paper entitled “Problems and Prospects of the Sugar Industry”, in which the author was discussed problem of disposal of molasses. In this paper the researcher has revealed that the large sugar production in 1995-96 has also created a serious problem of disposal of the unprecedented stocks of molasses has not been solved in all the Northern Indian states. The problem of disposal of molasses stocks has assumed serious proportions. In some instances, molasses tanks had burst during the last summer resulting in a loss of human lives apart from financial problems. If immediate corrective measures are not initiated, many sugar mills, particularly in North India, may be forced with premature closure because of the non-availability of storage space for molasses. Almost entire of the available space is already bulging with large molasses stocks.
Baviskar (1997) has examined “Sickness in Co-operative Sugar Factories” and the researcher has indicated that mismanagement is one of the main causes of sickness in the sugar co-operatives. The author has observed that the performance of the sugar factory depends on the efficiency and effectiveness of the management. Also there should be positive approach for the overall progress of the factory. Most of the factories were sick due to lack of good management. The author has concluded that the impact of decisions taken by the management leads to progress or sickness of the factory. It was the duty of the management to take only such decisions which have been benefited to the factory; particularly purchase procedure should be followed strictly. Stores inventory should also be according to the norms.

Doshi (1998) reviewed the problem of sickness in the sugar factories in Maharashtra in paper entitled “Sickness of Sugar Factories in Maharashtra”. According to the author, granting of licenses to new sugar factories on political ground rather than on economic feasibility conditions has been responsible for the emergence of the problem in the state. Reduction in sugar factories’ operational area because of emergence of a number of new factories, mismanagement of the factories for narrow personal gains of a few and lack of discipline in monetary management of the factories were the major reasons responsible for sickness in the industry, according to the author.

Mane (1998) enlisted various reasons responsible for sickness of sugar factories in Maharashtra in his paper entitled, “Sickness of Sugar Industries: Reasons, Results and Remedies”. The author mentioned that shortage of raw material within the operational area was the main responsible reason for sickness of sugar factories. Overstaffing, excessive unnecessary expenditure, technical inefficiency and financial difficulties were also reported to be the causes behind the unsuccessful operation of the factories. Author has suggested specific recommendations for the improvement in economic efficiency of
sick sugar factories. The author pointed out that along with proper maintenance of the machinery and hectic efforts for development of cane in the factory area, workers and officers were essential to improve financial position of sick factories.

**Ambhore (2004)** has studied the “Problems of Sugar Industry”. The author has mentioned that to solve the problem of sugar industry both the central and state governments took strong decision to cancel or reduce the excise duty on sugar; to cancel sugarcane purchase tax; to give subsidy on export, to abolish the tax on molasses, etc. The government has also taken decisions to control import of sugarcane from other countries and to reduce subsidies on sugar imported from the European countries.

**Jagdishlal et.al (2000)** an attempt has been made by the researchers to analyze the causes responsible for poor performance of sugar factories in India in their article on “Performance and Constraints of Sugar Industry”. The information collected form 139 sugar factories revealed that an efficient marketing network and better development efforts by the sugar factories produced encouraging results in tropical states. Varietal, weather and water stress were important productivity constraints. The author has pointed out that the existing marketing systems and cane development program need to be reviewed properly in sub-tropical states.

**Goel and Kaur (2001)** have worked on “An Analysis of the Performance of Bhogpur and Jagraon, Sugar Mills in Punjab” and analyzed the performance of these two sugar mills located in Punjab. They pointed that the coming up of new sugar mills based primarily on political rather than economic considerations should be discouraged for the sustainability of their growth. For an optimum utilization of their capacities such units have to depend upon qualities of cane supplies from the other region for which it may succeed only by offering higher prices due to higher costs of transportation. Underutilization of capacity of the sugar unit led to be a blocking of their resources. The authors suggested that the
government should regularly monitor the working of various sugar mills to get requisite feedback of the formulation and the refinement of polices. Its role should be facilitative and should attempt to create healthy and competitive economic environment for the working of heterogeneous group of units.

Sharma (2005) has investigated “Why Co-operatives are Often Coaxed for Poor Performance?” The writer of the research article made an attempt to evaluate the fundamental misconceptions in the minds of the people throughout the world regarding co-operative sector. The author observed that in the era of corporate scandals, most co-operatives are practicing a high degree of ethics and exhibited less greed.

Kumar (2005), Managing Director of N.F.C.S.F. in is paper has examined the “Sugar Technology - Prospects and Challenges” with reference to the technical area of the sugar industry and the efficiency norms applicable to the industry and concluded with a remark that the productivity can be improved by developing sugar complexes with the help of professional management.

Poswal (2005) has worked one “Constraints in Adopting Transfer Technology in Sugarcane Production”. In this study the author examined the influence of farmers' knowledge level on adoption of the improved sugarcane technology. The farmers were selected on the basis of size of holding. The area selected for the study was Muzafarnagar, U.P and the time period was 2003-04. The main practices adopted by the farmers in the context of cane varieties, planting operations, fertilizers application, irrigation management, weed control, plant protection, binding and harvesting were evaluated. The study revealed that the average knowledge level of the farmer was 49 percent, 60 percent and 58 percent among the marginal, small and other farmers respectively.
Tiwari (2005) has studied “Adverse Effects of Heavy Rainfall and Water Logging during Grand Growth Period of Sugarcane”. In the year 1998-99 relatively higher rainfall followed by water logging not only affected the growth of the cane crop, but also affected the recovery rate. In the present study the rainfall data between the periods of June to December of two consecutive years (1997-98 and 1998-99) and the dry matter production per plant of ten sugarcane varieties have been examined. The researcher came out with the conclusion that the after monsoon period, the varieties showed appreciable increase in dry matter production to recover themselves. The delayed growth of crop resulted in delayed sugar accumulation in the experimental varieties.

Panda (2007) in his research paper “The Privatization of Nayagarh Sugar Mill – A Right Step towards the Revival and Rebuilding of the Sick Enterprise” has made SWOT analysis of Nayagarh Sugar mill for two periods – Pre-Privatization and Post-Privatization. In this paper the researcher has tried to compare pre-privatization and post-privatization Strengths, Weaknesses, Opportunities and threats of the said sugar mill. After examining the case, he found that the reasons for making this cooperative unit sick were lack of full utilization of production capacity, lack of encouragement and training to sugarcane cultivators and occurrence of abnormal reasons like breakdown of machinery during crushing seasons.

Nair (2008) has begun his article “Sugar Industry Facing a Problem of Plenty” with the status of the sugar industry in India. The author has mentioned that out of 470 sugar mills in the country, about 60 percent are operating in the co-operative sector, 35 percent in the private sector and the rest in the public sector. The author has found that the Indian sugar industry is the most cost–effective, despite of small land holdings and low productivity. The investigator has depicted the problems faced by Indian sugar industry viz. government policy, regarding pricing policy (SMP & SAP), production cycle, sugar
export policy, levy system and decontrolling policy. The researcher has also mentioned that one of the weaknesses of the Indian sugar industry is that despite being an essential commodity, it accounts for only 1 percent of the GDP.

Lakhdive (2011) an attempt has been made by the author to analyze the “Problems Faced by the Sugar Factories in Vidarbh”. 20 sugar factories were installed in Vidarbha region of Maharashtra state during a span of last 35 years. But due to inadequate sugarcane supply most of the unit except two in the co-operative sector and three in the private sector were not working during 2010-2011. Thus, the situation has deteriorated to a great extent. When situation was examined and analyzed critically, some reasons/limitations appeared responsible for the decline of sugar production like, inadequate perennial irrigation in Vidarbha, lack of use of micro-irrigation, negligence in sugarcane development work, poor sugar factory management, input supply, low sugar recovery and competition by other commercial crops. Some suggestions were offered particularly regarding improvement in the existing condition and increase the area as well as production of sugarcane. The study concluded that the positive management support and research support from the agricultural university will be required to improve the situation.

Takale (2013) has discussed the important role of sugar industry as an agro-based industry in the development process of the rural areas through his article entitled “Progress and Problems of Agro-based Industry in India: A Study of Sugar Industry”. The study analyzed the trends of sugarcane and sugar production as well as recovery of sugar during the period 1950-51 to 2010-11. The author also discussed the comparative growth of sugarcane production and sugar industry in Maharashtra and Uttar Pradesh. The study has focused on the importance of Indian sugar industry in the world scenario. Author has observed that the Indian sugar industry faced many problems viz. problem of sugarcane, management problem, labour problem, production problem, problem of price
policy of sugarcane and sugar etc. Lastly he has concluded with the recommendations made by Dr. Rangarajan committee for sugar industry. The recommendations are freedom should be provided to the sugar industry to sell their sugar in the open market, profit margin should be share with farmers, dispense with the levy obligation and administrative control on non-levy sugar, state Government should buy sugar directly from the open market for PDS and should determine its price. It has also recommended that cane area reservation may be phased out; give an exemption on mandatory packing of sugar in jute bags, no ban on export and imports of sugar and minimum distance criterion for setting up of mills in study area.

Pawar and Zodage (2014) have explained their view regarding the sugar industry in their article on “Maharashtra Sugar Industry: Problems and Prospects”. They have clearly mentioned that the sugar industry played a very important role in the national economy as well as the state economy. Maharashtra sugar industry has made considerable progress especially in the co-operative sector. The main objective of this paper was to study the present scenario of the sugar industry in Maharashtra state. During their study they have observed that Maharashtra sugar co-operative faced various problems during these years. Some of the factors like low recovery rate, government policy, challenges of the private sector, lack of technical efficiency, lack of by-products etc. create hurdles in the progress of sugar co-operatives. To overcome these problems they have suggested some measures viz. need to be adopting professional management, utilization of by-products, and support price of sugarcane should be fixed etc.

Parmar (2015) has made a research work on “An Economic Efficiency of Sugar Co-operatives in South Gujarat Region of Gujarat.” The study has analyzed the various parameters of growth and performance of the five selected sugar co-operatives in South Gujarat region. The study was based on secondary as well as primary data. To examine
the growth of the selected five co-operative sugar factories in respect total cane crushed, total sugar production and sugarcane available for crushing, linear and compound growth rate were used. An in-depth analysis of the performance of the factories for 5 years was carried out in respect of capacity utilization, sugar recovery, and cost of production of sugar and cane price paid to farmers. The result of the study indicated that good land preparation, proper planning weeding, adequate irrigation and recommendation dose of nitrogenous fertilizer will increase the sugarcane production. The study also concluded that the sugarcane cultivation was quite remunerative, but if the price of cane dropped by co-operative sugar factories than it is difficult to remunerative cultivation, because there is no other marketing option for sugarcane in South Gujarat. The author suggested that capacity utilization performance, machinery maintenance and financial management need to improve in case of the Maroli co-operative sugar factory. It has also suggested that all the five factories need to take special efforts for increasing acreage yield of cane and production of adequate quantity and supply good quality to sugarcane cultivator in the operational area of the factories.

2.1.7 Problems Faced by Sugarcane Growers

Madiwal (2012) has depicted the dilemma faced by sugarcane growers through “Problems of SugarcaneGrowers in Maharashtra, Karnataka and Goa- A Comparative Study of Selected Units”. The objective of this study is to make a comparative performance analysis as well as to study the profile and problems of the sugarcane growers of some selected co-operative sugar factories. In this article the researcher has used three parameters i.e. personal profile, agricultural profile and problems. Pre tested structured questionnaires and personal interviews were used for data collection. The author has concluded with the findings that the management of the selected sugar units was not interested in creating awareness regarding the latest development in terms of
methods of cultivation, seeds, fertilizers etc. it was found to be poor and this will certainly affected the efficiency and productivity of the concerned sugar mills. It was also found that the management of these units had not arranged any study tour or field experiments for their farmer members as well as they never thought of organizing seminars, workshops and festivals for the farmers. It has also been observed that more labour requirement, limited land holding and additional cost and investments were found to be the major constraints for all the farmers while adopting the new cultivation techniques and technologies in sugarcane cultivation. It was observed that all the farmers of the selected units were under the clutches of some major problems. The author has suggested that the mills can take up an action plan to solve the farmers’ problem of finance and water supply to some extent. It has also advised the management to make necessary changes to check prevailing malpractices regarding the weighing procedures and unauthorized deductions; else, it may affect the goodwill of the mill in future.

Pollicepatil (2014) has studied the problems faced by sugarcane growers in Karnataka through “Profile of Sugarcane Cultivators in Gulbarga District of Karnataka”. The objective of this study was to know the socio-economic conditions of the sugarcane growers in Gulbarga district. In this study the research work was based on mainly on primary data but some information was collected through secondary data also. The study covers in three parts viz. personal profile, agricultural profile and problems faced by the sugarcane growers. This study concluded with list of various problems faced by the sugarcane growers’ viz. price of sugarcane, low rate of return, waiting in a long queue for harvesting, unnecessary deduction, non-availability of competitive buyers etc.

Das, et. al (2016) have worked on “Problems and Prospects of Sugarcane Growers in India: An Empirical Study”. The main objective on this paper was to study in detail about the problems faced by the sugarcane growers in India. The researchers have classified
problems of the sugarcane growers into three categories viz. operational problems, marketing problems and financial problems. Under the head of operational problems 6 points were covered viz. fertility of soil, lack of quality seeds, lack of experienced labour, lack of adequate measures and fertilizers, absence of continuous water supply, absence of improved agricultural practices. Delay in harvesting, absence of marketing facilities, lack of transport facilities, loss due to dryness etc. were drawn under marketing problems whereas, problems related to inadequate finance, absence of quick payment by the purchaser, price fluctuations covered under financial problems. In this context, the researchers have concluded that there has been a sharp decline in sugar production in the country. Consequently, the sugar prices plunged to such unprecedented low level and most of the sugar factories were not able to pay even the cane price. Added to it there was a sharp increase in the Supportive Market Price (SMP) of most of the agricultural commodities. Consequently, the sugarcane farmers shifted to cultivation of other remunerative crops.

2.1.8 Summary

The reviewed literature revealed some broad conclusions. A few studies have emphasized on the growth of sugar industry in the co-operative sector with reference to production, yield etc. but no study has focused on the factors affecting concentration in the sugar industry in the co-operative sector. Some of the studies seem to have emphasized the socio-economic impact of the sugar factories and have concluded that there is a positive impact on the rural economy due to establishment of the sugar factories. Some of the studies had concentrated on the problems faced by the sugarcane growers with some specific aspects. Most of the studies considered just one or two areas with limited parameters to discuss the problems faced by co-operative sugar industry. They have hardly made an attempt to analyze in detail the problems of the co-operative sugar
factories. Majority of research work is carried out on developmental changes observed in the sugar co-operatives in terms of technology, profit, by-product utilization, production improvement measures etc. but they have not given much importance to the recovery rate, management, administrative structure, role of government etc. in improving the performance of the sugar co-operatives.

It has observed that all of the above studies emphasized either development of the sugar industry in India, sugar industry in co-operative sector, impact of the sugar industry or problems faced by the sugarcane growers as well as the sugar industries. So far it is observed that no research work was undertaken to examine simultaneously the problems faced by the sugarcane growers as well as the sugar co-operatives with respect to different factories situated in South Gujarat region. Keeping this in view developmental parameters and the key problems are studied and analyzed in this research work.

After the reviewed of related literature of the study, section-2 is focused on the research methodology of the study.
## Section - 2

### Research Methodology

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Research Methodology

2.2.1 Introduction

Research refers to a critical and exhaustive investigation or experimentation having as its aim the revision of accepted conclusions in the light of newly discovered facts. D. Slesinger and M. Stephenson in “Encyclopedia of Social Science” propose a very comprehensive definition of research as “the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art”. In order to know how things respond to or change under specific conditions, what common denominators are discernible in their responses under various conditions are and what law they abide by etc., the social scientist subjects them to purposeful control that call manipulation, which is an aspect of experimentation. In modern times, research is often a corporate affair in as much as the complex techniques of collecting and processing data require interdisciplinary cooperation.

The research methodology is regarded as foundation of every scientific study and it needs to be elaborated in detail to understand the conclusions drawn from such a study in the right perspective of the readers and other researchers. The research methodology involves specifying the techniques and tools to be used for data analysis and data collection.

This chapter covers the statement of the problem, objectives and hypotheses; and to explain the methodology adopted for the present research work. It discusses the basic approach of the study, selection of sample, method of data collection and analytical techniques adopted to accomplish the objectives of the study.
2.2.2 Statement of the Problem

The increasingly high rates of interest charged by money lenders and violent fluctuations in the jaggery and sugar markets, led the farmers to utilize the underlying notion of self-help and self-reliance in the Co-operative Societies Act (1904) and led to setting up of co-operative societies and co-operative sugar factories. However, the real growth of the co-operative sugar sector started after independence, when the government decided to industrialize the country by expanding the co-operative sector. The principle of cooperation is assigned an important role for the country’s economic and social development and it is given priority over the other sectors. The role of co-operative sugar factories has been visualized as a cradle of the economic democracy in a vast country like India. As a second largest agro industry next to textiles, sugar industry has considerable significance to developing economy like ours.

After the commencement five year plans in the country, a rapid growth has been registered in the co-operative sugar industry. The establishment of sugar factories in each and every area brings necessarily many benefits to the farmers and rural people. The sugar co-operatives with the improved agricultural technology carried out to the doors of sugarcane growers. Due to the new technology; the area under sugarcane cultivation has continued to increase during the planning period. Sugarcane acreage as well as production of sugarcane has also increased, which has in turn increased the production of crystallized sugar during the planning era. In this period, export of sugar and percentage of recovery has also improved and the average duration of the crushing season in Gujarat has remained more than that at all India level. Thus it is quite interesting to examine the current status of the sugar co-operatives in South Gujarat.

The location of Sugar factories initially was naturally governed by the proximity of sugarcane acreage, which was concentrated in South Gujarat. The development achieved
in South Gujarat could be attributed to the increase and improvement in the agricultural activity and spurt in the industrial activity in the last three decades mainly in the sugar and paper industry. Therefore it is important to identify and examine the factors responsible for the centralization of sugar co-operative in South Gujarat.

The co-operative sugar industry has made a rapid progress and contributed much to the economy of the state. In spite of this, the industry has several serious and complicated problems which call for immediate attention and rational solution. The sugar factories having lower average sugar recovery in working days during the season and cane supply have to face a serious concern. Their condition further deteriorates because of the restrictions on the zonal movement of sugarcane. More or less all the above factors directly or indirectly affect the sugarcane growers, which can generate certain difficulties for them. Analysis of performance of the sugar factories becomes necessary to find out the reasons behind their successful or unsuccessful performance. In this regards, the study puts emphasis on the problems of sugarcane growers and the sugar industry of study area and attempts to find out solutions for the same and moreover try to suggest remedial measures for the better prospects of the sugar co-operatives. It is in this context that the present study on “Problems and Prospects of Sugarcane Growers and Co-operative Sugar Industry in South Gujarat” assumes importance.

2.2.3 Objectives of the Study

The following are the main objectives of the study.

1) To identify the factors responsible for the centralization of sugar co-operatives in South Gujarat.

2) To study the growth of sugar co-operatives and the present status of sugar co-operatives in South Gujarat.

3) To examine the socio-economic aspects of sugarcane growers.
4) To analyze the developmental change in the sugarcane cultivation area, production, cost of production, price as well as income from sugarcane farming during last five years.

5) To make a comparative analysis of the selected co-operative sugar factories in South Gujarat.

6) To study the problems faced by the sugarcane growers as well as the co-operative sugar factories.

7) To suggest remedial measures for the better prospects of sugarcane growers and the sugar co-operatives.

2.2.4 Hypotheses of the Study

1) There is no association between the level of education and holding Kisan credit card.

2) There is no association between the level of education and saving behavior and debt of the respondents.

3) There is no association between the income level and saving behavior and debt of the respondents.

4) There is no significant difference in various parameters related to sugarcane farming (sugar cane acreage, production and cost of production, price and income from sugarcane) between 2011-12 and 2015-16.

5) There is no significant difference in the average cost of production of various inputs between 2011-12 and 2015-16.

2.2.5 Scope and Utility of the Study

The sugar co-operatives have shown that thousands of farmers can achieve the goal of working together in form of cooperation and that the government policy may also be
helpful in this context. The working of sugar co-operatives have improved and meaningful attempts have been made to solve the problems of the weaker section of the society in an integrated manner. There is no doubt that the co-operative institutions have to play a vital role in the reconstruction of the Indian economy. They have contributed significantly to the growth of the national economy, agriculture, trade and industry. So the sugar industry is considered not merely an industry for producing sugar but an agency for economic development. In Gujarat, this industry has been developed for more than four and half decades only in the state. It is worthwhile to mention that a co-operative sugar industry in course of time becomes a centre of growth for the surrounding area; even though since the last few years, a negative trend has been observed in the case of sugar co-operatives in Gujarat state. In this context, the present study mainly focuses on the growth of sugar co-operative in South Gujarat and problems faced by the sugarcane growers as well as the sugar co-operatives of South Gujarat.

South Gujarat occupies a prominent place in the co-operative sugar industry. Out of 23 sugar factories, 17 sugar factories were working in the state during 2015-16, and amongst them 16 sugar co-operatives were operating in South Gujarat area only. (Annexure – 2 & 3) In this regards it is worthwhile and quite interesting to identify the factors determining the centralization and growth of this industry. This study also covered the status of the sugar industry and facilities provided to sugarcane growers through the sugar co-operatives. There are 16 sugar factories in South Gujarat area. Out of these, six co-operative sugar factories are selected for the study. Remarkable progress has been made by the co-operative sugar factories, and they are making a sizeable contribution to overall production of sugar in the country. The aspects outlined above have been studied with reference to these six selected factories and the selected respondents of these six sugar co-operatives. In this context, various aspects of growth of the co-operative sugar industry
and related problems have become the scope of this study. Previously, no study regarding the problems of the sugarcane growers as well as of the co-operative sugar factories have been carried out in this region. This comprehensive approach towards the problems and the recommendations made by the researcher at the end of this study may prove to be useful to the new as well as running co-operative sugar factories in the region. Not only that, but this study has also focused on the problems faced by sugarcane growers in this region, which can be helpful to sugar co-operative in their decision making process related to the farmers.

2.2.6 Research Methodology

In view of the manifold objectives, the data were obtained from various sources. To assess the growth of the sugar co-operatives and the problems faced by the sugarcane growers as well as the sugar co-operatives, both quantitative and qualitative data are collected. In this context, for the purpose of acquiring a broad idea; conversations were held with the sugarcane growers as well as the managing committee of the factories. In order to determine the impact of the sugar co-operatives on the sugarcane growers as well as the difficulties faced by them, some respondents have been selected from different villages for this study. This is essentially a sample study and exclusively based on empirical data. The criteria for the selection of the sample for the study are as follows:

2.2.6.1 Selection of Sugar Factories

Out of 23 sugar factories, 17 sugar factories are working in the state, amongst them 16 sugar co-operatives are operating in South Gujarat area, and out of them 6 co-operative sugar factories have been selected from different districts for the study. They are:

1. Shree Khedut Sahakari Khand Udyog Mandal Ltd.
   (Bardoli Co-operative Sugar Factory (Dist: Surat))
2. Shree Maroli Vibhag Khand Udyog Mandali Ltd.
   (Maroli Co-operative Sugar Factory (Dist: Navsari))
3. Shree Valsad Khand Udyog Mandali Ltd.
   (Valsad Co-operative Sugar Factory (Dist: Valsad))
4. Shree Narmada Khand Udyog Mandali Ltd.
   (Narmada Co-operative Sugar Factory (Dist: Narmada))
5. Shree Ganesh Khand Udyog Mandali Ltd.
   (Ganesh Co-operative Sugar Factory (Dist: Bharuch))
6. Shree Madhi Vibhag Khand Udyog Mandali Ltd.
   (Madhi Co-operative Sugar Factory (Dist: Surat))

These six sugar co-operatives have been selected in terms of their predominant shares in sugar production in different districts of South Gujarat region. Madhi Co-operative Sugar Factory is situated in Surat District but a major part of its operating area is in Tapi District. The sugar cooperative factories were selected such that the sample included the factories having good performance and others having not-so-good performance. This will throw light on various problems faced by the industry.

2.2.6.2 Selection of the Respondents

This is mainly an intensive study of the problems and prospects of the sugarcane growers and the co-operative sugar factories of South Gujarat. In this regard, the data comprise of the responses given by the selected sugarcane growers of the six selected sugar factories which cover each district of South Gujarat. Multi stage random sampling was used for the selection of sugar factories, villages and respondents. List of the selected sugar factories and the total members of respective sugar factories as well as the number of selected respondents are presented in Table No.2.1.
Table 2.1
List of selected sugar factories and total members and the number of selected members of the respective sugar factories

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of Factories</th>
<th>Total Members</th>
<th>Total Respondents (0.3% of the total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bardoli</td>
<td>5686</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>Maroli</td>
<td>20402</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>Valsad</td>
<td>18511</td>
<td>56</td>
</tr>
<tr>
<td>4</td>
<td>Ganesh</td>
<td>15981</td>
<td>48</td>
</tr>
<tr>
<td>5</td>
<td>Narmada</td>
<td>22218</td>
<td>67</td>
</tr>
<tr>
<td>6</td>
<td>Madhi</td>
<td>18277</td>
<td>55</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>101075</td>
<td>303</td>
</tr>
</tbody>
</table>

The selection of respondent farmers (0.3 per cent of the total) should be honestly admitted as a small sample. It was rather difficult to select all the sugarcane growers (members) of the six sugar co-operatives, therefore out of total 101075 members of six sugar co-operative 303 (0.3 Per cent) sugarcane growers members are selected for the study, keeping in mind, the time, money and effort constraints.

2.2.6.3 Sources of data

Information required for the study has been collected through primary data as well as secondary data.

Primary Data

For this study, the final questionnaire for the sugarcane growers was prepared on the basis of the responses obtained during a pilot study, and after that the primary data have been collected by personal canvassing of the revised questionnaire from the concerned villages of the operational area of the selected factories. The questionnaire is designed with different types of 206 questions for the respondents which covers different area of the
study. In this context, 206 questions are divided into two different parts which are given below.

**Part-A**

Part A of the questionnaire contained various types of information about the selected sugarcane growers. In all 36 questions comprised of general information related to the sugarcane growers regarding their family background, age, education, occupation and condition of residence etc. 92 questions provide data pertaining to sugarcane cultivation, irrigation, method of modern farming; use of high yielding seeds of sugarcane, cost and revenue of sugarcane farming etc. Overall 15 questions were related to the facilities provided by the sugar co-operatives to the sugarcane growers, awareness of respondents, use of transportation, and difficulties faced by the sugarcane growers for finance etc. Information related to income and expenditure of respondents, attitudes towards saving, debt, sources of credit, social status and modern equipment use by them etc. were educated through 29 questions. 20 sub questions were related to the problems faced by the sugarcane growers. Problems related to labour, irrigation, fertilizers, seeds, price of sugarcane, productivity of sugarcane and use of pesticides and insecticides etc, were included in this section.

**Part: B**

Part B consisted of 23 questions regarding information on various aspects of the sugar co-operatives. Differences of opinion between the management and the members and their resolution, level of modernization, price of sugarcane, recovery rate, by products, factors responsible for the downward trend in production of sugar and sugarcane, possibility of a private sugar factory in Gujarat, expectation from the central and state governments etc were included in this part.
Secondary Data:

The secondary data are necessary for analyze the growth pattern and performance of sugar co-operatives as well as to confirm the findings. These data were collected through the Annual Survey of Industries. The data with respect to the factories are obtained from the annual reports published by the Sugar co-operatives. By and large the relevant statistical data pertaining to different aspects were obtained from the annual reports of the National Federation of Co-operative Sugar Factories, Association of Gujarat –State Co-operative Sugar Industry (2014-2015), the handbooks of Indian Sugar Mill Association (ISMA), various websites etc.

2.2.6.4 Collection of Primary Data

The collection of primary data took about 9 months and many difficulties were encountered in the process. It is very difficult to established rapport with the villagers who have many misconceived notions and apprehensions about the investigators. Many of them thought that the interviewer was from the Government Department and wanted to enquire about their records of income and assets. However, with the help of some local people whom the researcher knew, who assured them that the person worked as a research scholar the researcher was able to get their cooperation. The data could be obtained only after two or three visits and hence 9 months (during November 2015 to August 2016) were spent in successfully completing collection of data from the selected sugarcane grower members. On an average six to eight sugarcane grower members were interviewed per day and it took around 35 to 45 minutes for each interviewed. The researcher explained usefulness of the study besides assuring confidentiality to the respondents through discussions and explained to them the objectives of the study. Once they were convinced about the importance of the study, the researcher received unbounded cooperation from them with utmost patience and sincerity. The researcher was
also arranged meeting with chairman, managing director and other administrators of selected co-operative sugar factories to gathered detailed information of sugar factories and take interviews to know their opinion regarding current position of co-operative in sugar industry.

2.2.6.5 Processing of the Collected Data and Analysis of Data

The selected respondents had fully participated in the interview and had responded to all the questions with positive cooperation and therefore, the data collection work was completed as per schedule. The data collected were carefully scrutinized and internal consistency was checked and then classified into various categories. After this, they were tabulated in an order. Then the interpretation and conclusions were drawn from the tables, applying suitable statistical techniques wherever applicable.

In order to accomplish the objectives of the study, the data collected from the primary and secondary sources have been analyzed using simple statistical tools viz. percentage, mean, standard deviation, Compound Annual Growth Rate. To test the normality of the data we have used the Kolmogorov-Smirnov test and the Shapiro-Wilk tests for testing the hypotheses. Hypotheses have been tested using the chi-square test and Wilcoxon signed rank test. We have also used Factor Analysis (a data reduction technique) for identifying sugarcane growers’ perception about the problems that take place in sugarcane farming.

2.2.7 Period of the Study

The study broadly cover the period of 10 years i.e. from 2006-2007 to 2015-2016. It is only for the purpose of maintaining uniformity in the case of all the co-operative sugar factories that this period has been selected for the study. 2006-2007 is the base year and 2015-2016 constitutes the last year for the study. The period of study in respect of many
aspects falls within this range. However, a few references on the nature and extent of
growth during the

Indian economic planning period were made in the part of “Scenario of Sugar Industry in
India”, indeed, to bring out certain aspects such as the land under sugarcane, production,
source of irrigation, financial credit and modern farming etc. within a sharper focus, it
was felt desirable to cover, the period 2006-2007 to 2015-2016. The changes during the
entire period from 2006-2007 to 2015-2016 have also been studied to have an idea of the
changes during this period resulting from the establishment of the sugar co-operatives in
South Gujarat.

Researcher is fully aware of the need to get the detailed authentic data on various aspects
of sugar co-operatives for analysis. The primary data related sugarcane crop production,
income and per acre expenditure etc. refer to the five year time period i.e. between 2011-
2012 and 2015-2016.

2.2.8 Limitations of the Study

The data for the study have been collected almost exclusively by personal canvassing of
questionnaires. The data so collected are subject to what may be called the error of
response to some degree. Such errors of response are largely due to the misunderstanding
on the part of most of the respondents. Some of the limitations of the study are mentioned
below:

(1) The analysis is restricted only to six sugar factories operation area in the South
Gujarat.

(2) Out of the total members of six sugar co-operatives only 303 (0.3 per cent) sugarcane
grower members were selected as the respondents for the study.
(3) Most of the respondents had replied in a causal manner. Moreover there were many inconsistencies in the information given by the respondents. So the error of response in some degree has to be considered.

(4) The primary data are related to the last five years and such it is difficult to say how far they are reliable. Respondents were unenthusiastic to give real information about their annual income because they thought that it is a part of an enquiry conducted by the government department.

(5) The study is also based on secondary data of the last ten years, so general limitations of the secondary data apply over here.

(6) The limitations of use of the statistical tools were considered for the study while some statistical techniques were applied to analyze the data.

Despite these limitations, this work is expected to be useful as a preliminary attempt to study the problems and prospects of sugarcane growers and co-operative sugar industry in South Gujarat.

2.2.9 Chapter Scheme

A brief outline of the chapters in which present study is articulated is given below.

Chapter 1: Sugar Industry: An Introduction

The first chapter is introductory in nature and highlights the current position of global sugar industry and historical background of sugar industry in India. Scenario of Sugar Industry in India during last ten years is also discusses with different parameters related to sugarcane as well as the performance of sugar factories. This chapter also deals with the importance of the co-operative sector for development of the sugar industry in India and Gujarat.
Chapter 2: Review of Literature and Research Methodology

The second chapter is divided into two sections. In the first section, related literature of study area is reviewed. The reviewed literature is presented under the six different heads namely, sugar industry in abroad, sugar industry and its impact, developmental changes occurred in sugar industry in India, sugar co-operatives in India, challenges against sugar co-operatives and problems faced by the sugarcane growers.

The second section is covers objectives and hypotheses of the study, scope of the study, selection of the factories and the respondents, limitations of the study and chapter scheme.

Chapter 3: Growth of Co-operative Sugar Industry in South Gujarat

Third chapter studies the growth of sugar co-operatives in South Gujarat as well as the factors responsible for concentration of sugar co-operatives in South Gujarat. The chapter also discusses the profile of the selected six co-operative sugar factories and also analyse the welfare activities undertaken by these sugar co-operatives.

Chapter 4: Data Analysis and Interpretation

In this chapter, the primary and secondary data are tabulated and different statistical tools are used to analyze the data and arrive at some useful conclusions. The fourth chapter is divided into following three sections:

(1) Profile and Socio-Economic Aspects of Sugarcane Growers

(2) Current Status of the Sugarcane Growers of Selected Sugar Co-operatives

(3) Problems of the Co-operative Sugar Factories in South Gujarat
Chapter 5: Findings and Suggestions

The fifth chapter provides the summary of the study. Important findings and suggestions emerging from the study have been listed. The chapter also highlights some areas as future scope of research studies.

The next chapter is present the growth of co-operative sugar industry in South Gujarat and also discuss the profile of the selected co-operative sugar factories of the study.