CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

Review of concepts and previous studies useful to define precisely the concepts used in the present study, to place the problem in proper perspective and to decide the framework for analysis. Since it would enable both the collection of relevant data, and meaningful interpretation of the results of analysis, an extensive survey of the previous studies and research work has been carried out and the same is presented in the following paragraphs. This chapter has been split into two sections. The first section comprises of historical perspectives, origin, growth and development of sugar industry during first and second world wars. The second sections deals with the reviews of previous references.

2.2 Origin of sugar industry

Galloway (1989) explained that the history of sugar is linked with a trio of institutions, which were anything but sweet. These are plantations, slavery and slave trade. Galloway's argument is similar to that of Mints as both emphasize that the development of sugar industry and trade was closely associated with the expansionist imperialism of the era of merchant capital.

The crop was produced in the colonial tropics and consumed in temperate Europe. The author further argues that both the dependent economic relationship between products and consumers and the pattern of production had their roots in the Mediterranean around 700 AD when the crop was first introduced from the east by the
Arabs and around B.C. 1600 when cheaper sugar from Brazil finally overwhelmed European production.

After tracing the movement of sugar to the Americans, the author shows how the various colonial industries developed up to BC 1800. However, the presentation is an overview of some of the important changes including analysis of the relationship between the physical characteristics of different producing regions and the spread of innovations.

The second half of the book is devoted to the period (1790) when the slave revolt in St. Domingue and productive forces unleashed by the expansion of industrial capitalism in and from Europe completely altered the world of cane sugar production. Abolition of slave trade and slavery were the most severe problems of the planters. The author also analyzed the changes in market forces, political, Economy, technology, labour and the nature of land in American, Asian, Indian Ocean and Pacific Industries during the nineteenth century.

2.3 Sugar industry and dependency of cane growers

Amin (1989)² focuses attention on the cultivation of sugar cane by small farmers in Gorakhpur region. He analyses the socio-economic and cultural conditions under which these small farmers became dependent upon traders, landlords and other intermediaries for marketing sugarcane for the production of crystal sugar. According to Amin, it was not the agency of commercialization but the process and relation of production in the country side that provided the material conditions for the development of agriculture. He gives the impression that sugar industry was the only commercial venture existing in Gorakhpur.
Amin discusses measures taken by the East India Company (EIC) to boost system manufacturing in India. The commercial ventures of EIC in sugar production proved to be a disappointment in both Gorakhpur and Azamagarh. Therefore, sugar was not an important article of export during the first quarter of the nineteenth century. The majority of the Halwais laboured for the Azamgarh residency and the Karkhanas could not sell any sugar to private traders. However, the demand for sugar from the company and private traders did not stimulate the growth of cane cultivation on Basti, Gorakhpur and Deoria districts. The honeymooning of sugar cane cultivation and jungle clearance was over by 1840 and the depression in sugar industry set in because of closure of London market.

According to Amin, the traditional system of sugar production continued without any serious setback. The fluctuation characterizing of the earlier phase of linkage with London market were on the wane. Further import of beet sugar did not replace gur as an article of direct consumption in the rural areas. Its impact was felt mainly in the bigger towns where Halwais (confectioners) for the manufacture of "mithais" not only replaced more expensive indigenous sugar with a cheap sugar refined with bone charcoal but also adulterated a superior quality of material "khoya" for preparation of "burfi" and pera without making them too sweet and deteriorating their nutritive value and ultimately making more profit out of the whole business. The only sweetener which suffered serious losses was Khandarsis in Uttar Pradesh.

Gur production on Gorakhpur was linked with the demand of the capitalist gur refineries of Kanpur, because gur produced from sugarcane grown in this district had a high sucrose content, which ideally suited the refiners. The proportion of sugar manufacturing from gur remained profitable during the first quarter of the twentieth
century. However, the linkage of gur production in Gorakhpur to the capitalist refineries in Kanpur did not alter the institutional arrangement within which sugarcane was cultivated and gur manufactured and marketed.

The setting up of sugar mills was started in 1920 but its pace was fastened with tariff protection conferred on sugar industry in 1932. The factor, which contributed to rapid development of sugar mills, was the supply of raw material and labour. Though, in the beginning, the sugar industry did feel the dearth of skilled manpower, later it was made up by experienced labour from Bihar. The growth of sugar mills was also evident from the increase in sugar cane consumption, which was 25% during World War I and increased to 28% in Gorakhpur. Most of those factories were located on the railway network. In the case of Dcoria, Pipraich and Ramkola, more than one factory was located at the same station. Consequently, the cropping pattern in this district changed, with a decline in acreage and food crops production. The sugar mills depended upon the landlords and Sahukars for the procurement of cane supplies.

Most of the big sugar mills owned sugarcane plantations while only half a dozen were profitably undertaking the manufacture of sugar, which suggested the attractive perspective capitalists. This was because of the supply of abundant and cheap sugarcane and labour. However data given suggest that the returns from sugar production were minimum in Goarkhpur district in comparison to those of other regions. The supply of labour to sugar mills posed no problem. Zamindar Farmers Association accounted for the production of about 60 lakh mounds of sugarcane. Only 1500 acres of land was held by European members and could not boast of such an institution. However the sugarcane cultivation was a normal and integral part of the agricultural activity and annual crop rotation by the peasantry. Gradually gur
production declined and more and more sugarcane began to be taken to sugar factories. The competition for purchase of sugarcane was not allowed to continue for a long time by the Indian sugar mills association.

Transport of sugarcane from farm to mill was another crucial problem to be tackled for efficient production of sugar. It appears that the major share of sugarcane was being transported by bullock carts. However the interests of cane growers and mill owners were not complimentary rather they were mutually opposed. Some measures were taken by the government to protect the cane growers from middlemen, such as fixing the price of sugarcane and the sponsoring of Co-operative marketing. The dependency and exploitation increased further with the introduction of crystal sugar production in Gorakhpur. Amin feels that some of the measures taken by the government increased the exploitation of cane growers.

Singh (1989)³ presents the growth of sugar industry in terms of sugar companies set up, area under sugarcane cultivation, export of sugar, price of sugar, sale of Bihar sugar in London markets. He suggested introduction of western method of cultivation of sugar and sugar manufacture etc.

Naquvi (1968)⁴ describes various centres of sugar production in upper India during 16\textsuperscript{th} to 18\textsuperscript{th} centuries. She dwells upon methods of sugar manufacturing, practices of sugarcane cultivation and the regional variations. She elaborates upon trade in sugar covering various centres from where sugar being exported and places to which it was being exported on account of the East India Company.

Gupta (1963)⁵ feels that it is the landed interest, which could increase sugarcane cultivation and in turn sugar production in Birbhum district of West
Bengal. The cropping system requiring heavy capital investments stimulates search for efficient management which in turn stimulates the adoption of both technical and organizational innovations including efforts to mobilize new sources of capital, gain access to new markets and experiments with new forms of vertical integration. The high demand for managerial ability tends to stimulate education and supply of expertise for the management of new enterprises, such as Co-operative sugar factories.

Inamdar (1978)\(^6\) indicated that the institution of Co-operative sugar factory represents the rising economic power of the landlord rich peasant class.

Bremen (1968)\(^7\) has also indicated in this article in 1978 that the institution of Co-operative sugar factory represents the rising economic power of the landlord rich peasant class.

Bagchi (1972)\(^8\) viewed that state intervention in the sugar economics in the pre-independence period broadly conforms to the imperial economic policy.

2.4 Sugar industry (1760 – 1858)

From 1785 very high prices prevailed in the sugar market in the United Kingdom. Two factors which contributed to a rise in sugar price were a) increased tea consumption and b) the sudden discontinuation of the supply of sugar from the French colony of St. Demingo, consequence of Negro revolt in August. After a gap of almost a century, there is evidence showing that agents of the company were exporting enormous quantities of sugar from Benares, Ghazipur and Jaunpur. From Benares in 1790 alone sugar worth Rs. 15,000 with fifteen hundred maunds from adjoining villages was to be bought.\(^9\) Similarly in 1792, twelve thousand maunds of
sugar was exported from Benares and Mirzapur and thirty five thousand maunds from Ghazipur. Export of Chinese from Bengal showed rapid increase. The quantity exported during 1791 - 92 was nearly two and a half times the quantity exported during 1787-88. The reasons for the increase were, abolition of the various rah - darry duties, Establishment of regulations for the customs and steady and impartial administration of justice, salutary effects of land settlements made during 1788 - 89 etc.

The exports of the kinds of sugar, such as shukar and raab also increased since 1792, the company had regularly been exporting Bengal sugar to England. Parallel developments were reported from Birbhum residency. The sugar pykars (itinerant on whole sale traders) of Birbhum had been delivering the article to the company since 1792. From the very year, English company started "investment on sugar the article was almost entirely transported to Calcutta and then exported to European and other foreign markets since it enjoyed special preference there. In 1792, a quantity of 18,798 mounds was estimated to have been produced in the district and retaining 4699 mounds for some consumption, the rest was exported.

Peterson found that Birbhum sugar cane was "infinitely richer than that in any other part in India and consequently best suited for manufacture of a strong grained high flavoured sugar. All these exports were on account of the company and used to be despatched to Bengal for export to other countries. The first privately owned European sugar factory in India was established in 1784 by the Civilian Crofts at Sooksagar, an estate on the Hughli Opposite Bandel, now submerged in the Hughli. Crofts obtained a contract to supply rum to the company's marine services and records that the concern was prosperous till 1795. The Ghazipur operators of the East India company reported that all the established works in the districts were held by natives.
East India company was proposed to be instituted by the court of Directors to assess, "the past and present status of the culture of sugar in Bengal and adjacent provinces with a view particularly to ascertain what improvements have already been produced from the regulations that have already taken place and in what degree it is capable of being further extended under the present or any other suitable encouragements that may be afforded".¹⁴

Since 1791, the East India Company and its capitalists started paying special attention to the cultivation of sugarcane and manufacture of sugar in India. For this the company invited Mr. John Petterson and Mr. Richard Cardin to introduce the West Indian modes of sugar cultivation and sugar manufacture. An attempt to manufacture sugar was made by Lieutenant John Petterson in 1791. An agreement was signed between him and the company stating that the company shall render all possible helps in procuring land for sugar plantation and employing three Europeans in the sugar works. In addition, he had obtained a loan of Rs 25,000 for the establishment of a plantation and sugar factory in Bihar in pursuance of the agreement. Petterson arrived in Bengal in 1792 and his first endeavour was to establish himself in Birbhum. The Board of Trade having given a loan got disappointed and noted that cultivation of cane in Bengal was extremely difficult, not because of want of skill, but for want of means of cultivation which prevented them from cultivating sugarcane.¹⁵ While Petterson failed, John cheap, the commercial resident of Sonamakhi, was running at Sural his own sugar factory known as "Chhota Kuthi". He imported an improved type of apparatus from Europe for the manufacture of sugar. He purchased some quantity of gur from the cultivators and produced a little sugar himself.¹⁶
The financial stringency faced by the company led to severe curtailment of its investment on sugar and trade in sugar in early nineteenth century. After 1805 came a prolonged depression as a result of which there was remarkable decline in trade with Great Britain. In addition, the demand for Bengal sugar was being replaced by Saltpetre, which even a dead weight ships was preferred. The court of Directors in 1808 directed the board of trade not to despatch sugar to England, which could interfere with required quantity of Saltpetre.

From 1814 onwards the Bengal sugar trade witnessed a spectacular revival. This was aided by wild speculations on the part of British private traders that followed the Charter Act 1813 abolishing the company's trading monopoly and slavery throughout the British dominions. Another feature worth noting was the predominance of the Indians in the sugar industry of the district, which was probably due to participation of Landlord interest, who could increase sugar cane cultivation wherever necessary, in comparison with the European entrepreneurs. There were about 45 sugar factories which exhibited great power of sustenance of the industry throughout the 19th century in spite of a number of vicissitudes it encountered.

Edward Campbell was engaged in sugarcane planting in Madras. Another planter Robert Campbell who turned to Indigo in 1799 clearly mentioned to the company that for a successful manufacturer it is necessary that he should be a land owner or have access to the supply of sugarcane. Efforts were also made to establish an industry in Bombay. Helenus, Scott, Robert Stewart and John Twiss in 1792 offered to engage themselves in production of sugar at Salsette. In 1801, Dr. Scott began producing sugar at Powey. W.J. Colly built a factory in Mynsurk, which produced 3000 tonnes of sugar annually. He recognized the value of molassess and
refused to sell his sugar to the company if he was not given a contract to supply the
government its requirements of rum.

After Charter Act 1813, the monopoly of East India Company was partially
ended. Consequently, India's foreign trade underwent some fundamental changes,
after having remained undisturbed for some centuries. India was left without any
protection for competing with British manufacturing industries. Consequently all the
Indian conventional industries were destroyed and Indian cultivators were forced to
produce commercial crops for the export market at the expense of food crops and
subsistence agriculture at global level. However the opening of inland trade to private
merchants in 1813 and the growth of an extensive market for eastern regions in 1820's
weakened this link to some extent. Private traders from Calcutta made their presence
felt for the first time in 1817 when they were reported to be scrounging the arrange
and catchment's areas at the rate of 41 to 43 per bale to the Karkanedars in the
mufassil. During 1820’s a concerted campaign against slavery and slave produced
sugar was fast building upon England in which the private trade interests which then
dominated the court of Directors, were playing an important role. Since 1822, these
free -trade elements within the company were trying to bargain for a lower duty on
sugar in return for this agreement to the proposed East India Bill.²⁰

In 1832, winding up the company's sugar business at Banaras, the commercial
resident observed, "so long as the central Indian demand lasts, the influence of prices
in Calcutta or London will be felt less on Eastern U.P. than a first sight might
naturally be supposed". The bigger private merchants operating in a booming sugar
trade could now match the kothi in manipulating sugar prices. They used to hold back
stocks and raise sugar rates in bazaars.
The introduction of Mauritius and other canes into India may be said to be another step taken by East India Company in the direction of patting Indian sugar industry on the path of prosperity. However the attempt made by the company to encourage European planters to grow introduced canes after the method practiced in the West Indies was doomed to failure, because the introduced tropical varieties of canes were unsuitable for the subtropical tracts of Bihar and Bengal.

In the year 1827, Captain Sleeman brought the Mauritius canes into India and deposited them in the "Botanical Gardens of Calcutta". The transactions of the agricultural society contain details of the cultivation of these and other foreign canes. It must also be mentioned here that captain Sleeman received the gold medal of the above society in recognition of being the most energetic worker in the experimentation and introduction of foreign canes.

The Charier Act of 1831 became the instrument of the new born British capitalism; the regiments of the company's free booters were now replaced by British entrepreneurs. The Act completely diverted the company of its remaining monopoly rights, throwing open the gates of India to the British capitalists to exploit its natural resources to feed and support British manufacturers, which the Industrial Revolution of the age demanded. The principle of Laissez Faire in trade, which inspired Act, led a flow of British capital into India though the company's policy was somewhat in the nature of a damper. 21

It was expected that free contacts with the Indians will lead to an enhancement in their standard of living involving indulgences in English luxuries like wine which correspondingly inspired increase in demand for consumer goods from Britain. Thus both as a market for finished goods and as a depot of new materials, the stage was set
up for a complete annihilation of the industries and mercantile communities in India. Consequently, the upper classes of the mercantile communities of India turned their attention to other fields of investments for their money capital and lower classes like ordinary traders, artisans and weavers to cultivation, while others finding no other opportunities of employment, because of limitations of industrial activities, migrated to colonial plantations of European power in Africa and West Indies.\(^{22}\)

In 1848, Lord George Bentinck stated "an Bhurtpur district of Bengal in 1844 nineteen engines of 240 horse power have been erected and 15 more of 180 horse power are in course of erection".\(^{23}\) The factories established in Madras included those at Chiltwasah and Nellikuppam and the one set up by the firms of Binny and Co and Parry and Co.

Binny and Co initiated the factory in Ganjam, which later under Minchin's supervision developed into a pioneer cane diffusion factory, while Parry and Co. financed a factory at Neelikuppam and remained till 1947 a well-founded and secure undertaking. In South India, after Binny and Co had been compelled to transfer their sugar interest to Parry and Co., the later came to hold a practically monopolistic position in respect of production of white sugar and spirits. In respect of spirits Parry and Co were the sole suppliers for many local governments. With the adoption of a free trade policy by the Home Government, almost the whole of the industry in India collapsed. In Madras only the concerns managed by Binny and Co. and Parry and Co. survived till 1947.
2.5 Growth of sugar industry upto world war

By 1862 the number of sugar manufacturers increased from 30 to 52 and export from Calcutta had increased from 16,000 to 20,000 maunds per year. In Pragana South Haveli areas under cane cultivation had increased from 100 acres in 1837 to 7844 acres in 1862 and whereas there was no sugar manufacturer worth the name earlier. During 1867-68, India imported refined sugar about 4,34,306 CWT and in 1885 - 86 the quantity imported had increased to about 1,64,071 CWT. Till 1900-1901 the amount of sugar imported was about 37,70,144 pounds. The main causes for increase in the quantity of sugar imported in India was its low cost. In addition, America had put an embargo on imports of sugar. Consequently Germany and other countries entered in the sugar market and Indian sugars being costly could not compete with the imported sugars. The reasons assigned for this include the use of defective and wasteful process for the manufacture of sugar. The recovery was very poor due to wooden rollers used for juice extraction. Later iron mill for crushing cane was introduced. In spite of the iron mill use, indigenous refined sugar was costly in comparison to the imported sugar, with the result that the imported sugar had an edge over the locally produced sugar.

The first factory style gur refinery was set up in 1874. This was the Cawnpore sugar factory of Begg Southerland and company erstwhile indigo traders and managing agents who in the wake of the depression switch to sugar in the early twentieth century.

One of the remarkable features of foreign trade during 1890 - 1900 was the rapid rise in sugar imports. Sugar was imported mainly from Mauritius and Java. It was only when the beet sugar imports started after a protective tariff had been placed
on them in America that the real blow was struck at the Indian sugar industry. Beet sugar forced prices down to extremely low levels and consequently sugar refining in Indian factories became unprofitable. Between 1895 and 1900 alone more than 180 small refineries in the United Provinces had to close down and many went out of production. Thus, sugarcane cultivation began to be abandoned in favour of other more paying crops.

In 1904, the Government officials as well as nationalists also demanded expansion of the sugar industry. Noel Panton from the commerce intelligence department, Government of India presented a note on the development of sugar industry in India on 13th July 1907. In this memorandum, keeping the problems of both foreign and Indian capitalists in view, a proposal for setting up a central sugar mill under the aegis of the then British Government was made. The places suggested for the proposed sugar mills were Gorakhpur, Meerut, Banda and Bellary. But the British government declined the proposal finally.

In 1905, after the industrial conference through Pandit Madan Mohan Malvi'a's intensive efforts, a local company was established. The company established a sugar workshop at an expenditure of Rs. 3 lakhs. It was suggested that the mill should refine gur instead of producing sugar from sugarcane juice so that it could work for 10 months in a year. Despite these developments, there was a decline in the area under sugarcane cultivation and in the number of unskilled employees because of the introduction of machines on sugar industry.

In 1914, a sugar factory was established at Tamkhoi, followed by factories at Govri Bazar, Rayam, Sardar Nagar, New Savan, Pachrukhi, Chughli, Bhatni, Samastipore, Padravna and Belar during or immediately after the First World War.
The sugar industry in India got effective protection during the first world war due to a fall in imports of sugar from foreign countries. Consequently, both the output of sugar and area of sugarcane went up, though the increases were moderate. The supplies of machinery from abroad were restricted and this acted as limiting factor for growth of sugar industry, as industrial Sector.\textsuperscript{27} The war however, also stimulated the interests of the government of India in the industry. Sir James Mackenna, agricultural advisor to the Government of India, submitted a scheme for a sugar bureau which would comprise a factory expert, an engineer, a chemist, an agriculturist and a botanist with an officer a secretary to the bureau was appointed and he did some valuable work in assembling a mass information on the trade side and disseminating information on Coimbatore cane in Bihar.

\subsection*{2.6 Sugar industry after First World War}

In 1919, the Indian Sugar Producers Association Kanpur approached the Government of India for appointing a sugar committee to advice on all aspects of the industry. An enquiry conducted by the committee reveals that there were 22 factories in India working mainly with sugarcane. Of these, 10 were in Bihar and United Provinces and three in Madras. None of the Indian factories worked upto full capacity and half of them crushed only half of the cane their mills could deal with.\textsuperscript{28}

The recommendations of the Indian Sugar Committee were rather mild; it wanted the government to set up a Sugar Board with five officials and six non-official members. It also recommended the establishment of a sugar research institute with three divisions, agricultural, chemical and engineering, a pioneer model sugar factory in northern India and school to train sugar technologies. It also wanted the
government to fix a scale of prices for sugar cane products, so that the latter were protected against exploitation by sugar factories.\textsuperscript{29}

In 1929, the Government of India addressed all local governments on the status of sugar industry. The three Provincial governments most interested in sugar industry, namely, the government of Punjab, the United Provinces and Bihar and Orissa together with the government of Bombay had asked for an enquiry by the tariff board on receipt of replies to the government's letter, the question was examined by a special committee appointed by the imperial council of Agricultural Research in 1929. The committee consisted of civil servants, technical experts and representatives of the sugar industry. Of the suggestion of the committee made in its report, the council resolved that the government of India be asked to refer the general question of the import duties on sugar for investigation by the Tariff Board. It was this resolution, which led the Indian Tariff Board to examine the question of according statutory protection to the sugar industry.

Therefore, the Tariff Board decided that in view of the importance of sugarcane for the agricultural economy of India, the interests of sugarcane growers should be protected by the state. Unless steps are taken to develop the white sugar industry, a disastrous slump in the gur market is probable, which will seriously affect the agricultural classes disorganize the agricultural system and involve the abandonment of better cane cultivation in large areas".\textsuperscript{30}

The government accepted the Tariff Board's recommendation with the stipulation that the position would be reviewed by a statutory enquiry before the end of seven years of protection. The select committee of the Legislative Assembly, however inserted a clause in the preamble to the Indian Sugar Bill of 1932 to the
effect that protection was to continue until 31 March 1946, and that the statutory
enquiry before 31st March 1938 would only determine the form in which the extent
protection was to be given.

Gandhi (1934) explained the Indian Sugar Industry and its Past, Present and
Future has mentioned many problems. Some of the important problems were-
utilization of molasses and bagasse, reduction of cost of cane, improvement of quality
of cane, undue competition in purchase of cane, supplies of cane in areas adjacent to
factories, provision of irrigation and drainage facilities, extension of duration of
crushing of cane, marketing and distribution of sugar, technological research on
ways on which increasing percentage recovery of sugar and fixation and
improvement of standards of quality of sugar.

There was a considerable improvement in the quality of sugarcane. The
production of sugar in the country increased from 350 thousand tonnes during 1930-
31 to 1250 thousand tonnes during the year 1936 - 37 and 920 thousand tonnes on
1946-47. The number of factories increased from 29 during 1930 - 31 to 140 during
the year 1936- 37 and 170 in the year 1946 - 47. During the same period import sugar
fell from 809 thousand tonnes to 22 thousand tonnes. The import of sugar was
reduced during 1946-47.32

During thirties and forties, the establishment of new sugar factories as well as
production were concentrated in UP and Bihar. However, there after, the
establishment of sugar factories in Bombay and Madras received a marked impetus. It
also resulted in the abolition of sugar import in India.33

Another important feature of postwar reconstruction plan was that since 1937
sugar industry was operating under the protection law enunciated by the government
and the law was extended until the end of 1946. Therefore, the official view was that no change in the post practice was necessary. In Uttar Pradesh, it was decided to launch a big project of agricultural research worth 9.72 crores. It proposes a development of Co-operatives for marketing of sugar cane was also on the agenda. Most of these schemes were focused on the development of roads, irrigation facilities and electric power. Though Bombay laid emphasis on the expansion of sugar industry while Madras, the South Indian Chamber of Commerce stressed the need to install without delay more power alcohol plants and take steps to increase the cane area.

A concrete scheme for marketing organization was placed before a conference of representatives of sugar industry from all parts held in Calcutta in August, 1934, but it was not until the early part of 1937 when the precipitate crash in the sugar market made immediate action imperative that the Indian sugar syndicate was actually formed in June 1937. In 1938 the syndicate controlled about 100 factories in Northern Indian. The mills were given assurance that the Indian Sugar Syndicate would convert itself into an organization for the sole purpose of selling sugar. The government would fix the quotas for sale and limits of prices for each factory within the norms prescribed by the respective governments.

2.7 Features of the development in sugar industry

Sugar factories in the Co-operative sector setting largely, due to the government policy of giving preference to Co-operatives in the matter of licensing. Accordingly, the numbers of cooperative sugar factories have gone up from 2 during 1950-51 to 252 in 31st May 2002. Setting up of new sugar factories in the tropical region as result of which the expansion of industry has been mainly in western and southern India. There was a progressive increase in the tonne crushing capacity per
day from 1000 TCD to 2500 TCD and 5000 TCD. In order to encourage the setting up of new sugar factories and expansion projects, government has been operating various incentive schemes from 1975 onwards under which a higher percentage of free sale quota is allowed for a specific number of years to such factories to enable them to service the term loans taken by them for executing the projects and thus become viable.

The average recovery per capita cane, which is a combination of cane quality and efficiency of conversions were 10% during the last decade. However it is seen that recovery has consistently been above 10% in the western/southern states of Maharashtra, Tamil Nadu, Andhra Pradesh and Karnataka. The economic and social considerations and international commitments have always exerted great influence on the level of technology which has been upgraded from time to time to improve productivity, conserve energy eliminate human error, reduce elements or labour cost and reduce cost of consumable. Research and development activities pertaining to process and sugar mill equipment were being undertaken at National Sugar Institute in Karnataka, Vasant Dada Sugar Institute in Pune, Central Electronics Engineering Research Institute in Pilani and Council of Scientific & Industrial Research.

Work on improving the productivity and quality of cane is being carried out by a number of institutions, prominent among them being, Sugarcane Breeding Institute in Coimbatore, Indian Institute of Sugarcane Research in Lucknow, Agriculture Universities in Tamilnadu and Andhra Pradesh and Research centers of Indian Council of Agricultural Research.

Reducions of sugar loss in bagasse and final molasses have significantly contributed to the improvement in productivity. With a view to improve and maintain
the quality of sugar as well as to bring down the cost of conversion. Government of 
India introduced in May 1988, certain norms of efficiency to be achieved by all sugar 
factories in the country. New sugar factories and expansion projects are also 
penalized in their incentive quantum for non-achievements of the prescribed norms. 
Sugarcane production has increased enormously over the years to keep in tune with 
the increase in crushing capacity of the sugar factories.

The rapid increase in the production of sugar over the years has been achieved 
mainly by diverting larger area to cane. However, efforts are under way to bring about 
further increase in yield through development of newer varieties, better agronomical 
practices providing adequate fertilizer and irrigation and adoption of proper plant 
protection measures.

For the development of a sugar industry, a fund known as the "sugar 
development fund" has been created which is being financed through a cess levies on 
each bag of sugar produced by each sugar factory. This fund is utilized for advancing 
programmes as also for cane development schemes in their areas of operation.

The government has been following a policy of partial control with dual 
pricing system since 1967. Under this policy, a specified percentage of the total sugar 
production of each sugar factory is procured by the government at controlled ex-
factory levy prices for distribution through the Public Distribution System, (PDS) at 
a uniform retail issue price throughout the country. The present ratio between levy 
and free sale sugar is 40:60 during 1992-93 and it has been revised to 30:70 during 
the year 1999 - 2000.

It may, however be relevant to point that on the average about 50% of the 
cane production in India is utilized by the organized vacuum pan sugar industry.
Allowing about 12% for seed, chewing etc. the balance nearly 38% is processed by the jaggery / Kandasari sector. The production of jaggery/kandasari is about 9 million tonnes during the year 1992-93.

**Moreland (1907)** describes different methods of sugarcane processing and points out the above phenomenon. He says gur producers are generally small growers, who for any profitable business must depend upon rabi producer.

**Baviskar (1980)** attempts a situational and structural analysis of one of the oldest Co-operatives in Maharashtra. The most interesting feature of such a "growers Co-operative" organization is that the composition of its share holders was a representative of the major caste groups in the state, whereas the lower caste people usually employed for menial work.

**Amin (1981)** clearly brings out how the various mechanisms of vertical capitalist penetration, we have been describing, come together though differently for different crops with the particularity of the crop adding its own variations For the pre-sugar factory period 1850 - 1920, Amin describes the dependence of rabi producing peasants on the sugar refineries. Later gradually came to exercise the virtual control over the production process of such peasants through a system of advances which were either given directly or through land lords, to whom the peasants paid rent in any case.

**Tripathy (1993)** in his research work on "Indian Sugar Industry - a Profile of Co-operative Sugar in the year 1993" gives the following suggestions for developing the sugar industry:
i) The installed capacity of the sugar industry to be increased in internal consumption and export orders.

ii) Great stress should be laid in proving the process, design and engineering of the machinery with the modern technology upgradations.

iii) Priority is being accorded to allow securities to expand at least to the minimum economic level. For this purpose, loans from financial institutions in co-ordination with the sugar development fund are being utilized for financing these projects.

iv) In order to meet the cane requirement, stress is being laid on increasing the yield and quality of cane. Various programs for varietal improvement, adoption of improved agronomical practices, ratoon management, are being taken up through the factories.

v) Government of India is laying great stress on the installation of efficient treatment plant and air pollution control devices to control environmental pollution caused by the sugar factories. As per the latest information available 321 Sugar factories have so far installed effluent treatment plants and 233 have installed air pollution control devices.

Marathe (1995) Managing Director National Federation of Co-operative Sugar Factories Ltd. has narrated in his article titled, “Problems and prospects of development before Co-operative sugar industry in India”. The Co-operative sector of sugar industry is facing problems and is likely to face many more problems under the new economic policy and this may considerably affect the future prospects of development of Co-operative sector of sugar industry in future in our country.

Sugarcane price as well as sugar price is very sensitive issues which guide the
working of the sugar factories to a very great extent. The dual control on sugar factories in the sense, that the factories have to give a certain percentage of their production as levy quota for public distribution system at much below the actual cost of production and the balance of quota for sale in the free market at prices determined by the supply and demand factor.

The cost of cultivation of sugarcane is increasing by leaps and bounds due to the following influencing factors, they are: shifting of more cane growers to various urban occupations, demand for higher labour rates, increase in power tariffs by state governments, the double fold increase in prices of chemical and ingredients, considerable increase in packaging and transportation charges. The compulsory acquisition of some quota from sugar factories for public distribution system, below the cost of production ensures with certainty losses whereas it is not known whether these losses will be made good by sale of sugar in the free market.

**Raju and Saikumar (1996)** narrated the changing profile of sugar industry in India. Modernization of existing sugar mills requires financial assistance. It is suggested that the period of free sale quota in the form of incentive schemes for new factories be raised, so that the economy position of the factories could be strengthened. In order to produce more cane in the country, first and foremost, step is minimum cane price announced by the government should be made attractive in comparison with other groups. Since sugarcane is a highly perishable crop it requires speedy transportation. Since almost all the sugar factories in the country are located in rural areas, there is a need for better road facilities. It is suggested that the government has to release the cess collected from the factories under Sugar Cess Act for the construction of better roads in the sugarcane cultivation.
2.8 General reviews on sugar industry

**Katzel (1975)** emphasize on job satisfaction, which motivates workers to higher productivity. This is a break from financial motivation.

**Prokopenka Joseph (1978)** viewed on the particular problem of developing countries in improving productivity. Those cannot be compared with those of developed countries.

**ILO (1979)** analyses all aspects of work study and points out the movements as to how to go about it. It involves not only human movement, but also material movements and the time involved.

**Bernolak Imme (1980)** examines dimension of productivity problems at micro and macro levels. The problems at macro level cannot be compared with those at micro level.

**Haggerty (1980)** brings out the changing ideas of productivity in the context of changing technology and hence the newly evolved human relations. The change in technological aspects of the people and the idea of productivity has to adopt to this change.

**Mole (1981)** highlight the different aspects of productivity and in the manpower forum, especially as a human engineering concept.

**Kathleen (1982)** reviews the concept of productivity in the changing economic scene. The technique of production, art of management etc changes so also the concept of productivity.
Saxena (1983)\textsuperscript{50} noted the special problems of management in dealing with productivity in developing countries. They have to face so many constraints, such as, physical, financial and political. The special problems in Indian situations are highlighted.

Narayanaswamy and Ramachandran (1988)\textsuperscript{51} have concluded that the sugar mills have to purchase sugarcane at the price advised by the state government which is substantially higher than the minimum price fixed by central government, and should not have a free hand in the sale of sugar, since the releases of sugar being controlled by the government. The price of input and output of sugar are decisive factors in determining the development of Co-operative sugar mills. But these two factors cannot be manipulated and controlled by the mill as they are controlled by the government.

Ramasamy (1989)\textsuperscript{52} highlights the working of Salem cooperative sugar mills ltd with special reference to productivity and profitability.

Muthuraj (1993)\textsuperscript{53} throws light on all the aspects of productivity, particularly as applied to the Co-operative sugar mills in Mohanur labour productivity and financial productivity are clearly outlined.

Boothalingam (1996)\textsuperscript{54} studied the diversification and increased efficiency in sugar production of Co-operative sugar mills regarding the usage of their by products. He has added that the inclusion of value added by the Co-operative sugar mills are enabled to provide better return to their members, he has added.
Murthy (1996)\textsuperscript{55} studied an effective comparison made between the performance of sugar industries in Tamil Nadu and Andhra Pradesh with particular reference to problems faced by them.

Narassiah and Jayachandra (1996)\textsuperscript{56} have studied about cash management of Kovur Co-operative sugar mills Ltd., Nellore. They have suggested that the current ratio are maintained below the standard norm, and the inventory as occupied as a major item in current assets in the Co-operative sugar mills. The net cash flow coverage ratio of the mill was negative because of the inconsistent cash flow and sufficient maintenance of liquidity. They have measured only the liquidity position.

Rao (1996)\textsuperscript{57} has studied certain policies of sugar mills. He examined the sugarcane pricing policy such as statutory minimum price and state advisory price. He also suggested that the diversification is a very important key factor for improving the status of Co-operative sugar mills, and it is one of the major solutions for overcoming the present problems of Co-operative sugar mills.

Bharath (1997)\textsuperscript{58} has described that the sugar mills are facing the problems of liquidity position. Hence they should consider how to take the financial crisis without borrowing much. The sugar mills should follow planned rational allocation resources from various functions of the mills.

Muthuraj (2000)\textsuperscript{59} has attempted to appraise the productivity of sugar industry in Tamil Nadu.

Gavade and J.E.Patil (2001)\textsuperscript{60} have concluded that the sugar co-operation by ensuring that the quality and price of the service are more attractive compared to their counterparts in private and public sector to face the 21\textsuperscript{st} century international market
situation more efficiently. All these competitive advantages would come to nothing unless sugar mills cane face the private sector competition within and without we expect in the wake of gradual degradation and globalization.

Christine Bolling and Nydia R Suarez (2002) study concluded that Brazilian Government policies supporting economic liberalization are likely to stimulate greater sugar production and result in increased Brazil sugar export availability. Brazilian sugar can be expected to remain competitive in the world market because of increased internal efficiencies as Brazil deregularises its industry, modernizes its ports, and reduces its transportation costs from the mill to the port. However, the main determinant of growth in sugar output and exports is likely to be the government policies affecting production and use the ethanol. These policies may be affected by trends in international prices of crude oil, as well as by Brazil’s approach to environmental issues such as air quality.

Dhingra (2002) viewed that Indian Agriculture has been the source of supply of raw materials to leading industries like cotton, jute, textiles, sugar, vanaspathi and plantations. There are many other industries which depends on agriculture in an indirect manner. Agriculture contributes a large share to the national income in India that is the share of various agricultural commodities, animal husbandry and ancillary activities has been about 35 percent in agro based industries.

Gehawat (2004) mainly deals with deficiencies of the sugar industry in India and the modernization techniques to be adopted to improve it. He argued the need to expand the production capacity of this industry and to develop the ancillary units to exploit the wastes of sugar industry. He also emphasizes the need for diversification of sugar industry.
Vinay Kumar (2005)\textsuperscript{64} examined that the Co-operative sector of the sugar industry is a furious industry, with vast potentials. However, being an industry of small and margin formers, it needs financial support from the central and state government. The vision for turning that Co-operative sector factory into complex is the Co-operative sector strength of the sugarcane farmers.

Poggio (2006)\textsuperscript{65} used statistical tool of FEAT (Farm Economic Analysis Tool) under benchmarking process. It is a useful tool for managers, however the results should be interpreted with caution and consultation with a qualified person recommended before implementing a strategy. The benchmarking initiative also highlighted the main drivers behind farm profitability and provided growers with a basis to measure business performance in the future.

Ganesan (2007)\textsuperscript{66} suggested to Co-operative sugar mills that they should take measures to minimize the time lag between resource mobilization and utilization and in order to reduce the outside borrowings, Co-operative sugar mills may enhance the share capital contributed by the members.

Singh (2007)\textsuperscript{67} has concluded in the right of recent policy charges in the industry. Policies of de licensing and decontrol and various incentives provided by the Government of Utter Pradesh would encourage the private producers not only to expand their production capacity but also to diversify their activities.

Clark (2008)\textsuperscript{68} examined the emerging technologies in sugar processing related to sugar factory operations are reviewed in the context of the potential impact of new factory technology. Increased productivity is the key goal and is a more complex issue than factory technology and it is a more complex issue than factory
output alone. It is related to the efficient use of resources, including energy, equipment design and reliability and performance optimization. The potentials of these technologies and their application to each stage of sugar production processes are outlined.

Ministry of Industry (2009)\textsuperscript{69} reported the role of sugar industry in India GDP has been quite beneficial in the economic life of the country. The worldwide trade of sugar has boosted up the GDP of India to a great extent as this sector has brought in a huge amount of revenue to the country.

According to Ruddar and Sundram (2009)\textsuperscript{70}, Agriculture has always been the back bone of the Indian Economy and despite concerted industrialization in the last six decades, agriculture still occupies a place of pride. It provides employment to around 60 percent of the total work force in the country.

According to Shrivastava et al. (2012)\textsuperscript{71} for improving the productivity of sugarcane and ensuring the sugar supply, research strategy should be pro-nature and pro-small farmer oriented. New technologies are needed to enhance productivity per unit of land, time and water to overcome the prevailing technological fatigue. Soil health enhancement and balanced fertilization, especially the micronutrient component, hold the promise to raise the productivity component, hold the promise to raise the productivity of small farmers/farms. More emphasis has to be given to jaggery/gur and value-added products. Organic gur/jaggery seems to be a lucrative option.
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