CHAPTER-VIII

PROBLEMS AND SUGGESTION FOR SUGAR INDUSTRIES

8.1 Introduction.
8.2 Problems of Sugar Industry.
8.3 By Products.
8.4 Suggestions

Summary and Conclusion.

BIBLIOGRAPHY.
through Banks production loans to the gowers. They have implemented the wage Board's running canteen etc. The cooperative sugar factories and societies are registered under the cooperative Societies Acts of various States and, therefore, their functioning is regulated by normal cooperative rules and practices. However, the managerial problems are still to be solved successfully.

The sugar industry in the region, however, has had several problems to face from the very beginning. One of the major problems conferred with the sugar industry is the underutilization of production capacity.

The major reason for underutilization of production capacity was the insufficient supply of sugarcane to the sugar factories. In fact, the acreages of sugarcane as well as proportion of sugarcane supplied for sugar production have shown increasing trend during the period.

There was thus, imbalance between the per sugar factory production capacity and acreages under sugarcane and the same needs to be tackled on priority basis in order to avoid the problem of underutilization of production capacity of the sugar industry.
Another important problem faced by the sugar industry was due to fluctuations in the price of sugar and sugarcane. The rising prices of sugar and sugarcane have undoubtedly acted as catalysts for the progress of sugar industry in the region. At the same time, the sugar production as well as sugarcane production activities were affected disastrously during the periods of fall in the price of sugar and sugarcane.

The changing policies of the government with regard to procurement, interval distribution and export of sugar also have had greater impact on the progress of sugar industry in the region.

8.2 PROBLEMS OF SUGAR INDUSTRY:

The foregoing study of development of sugar industry in Maharastra, indicates that the state has emerged as a leading sugar producing state in the country in the last four decades, but alongside its galloping progress, the sugar industry has created many problems of its own. There are many taluka in Solapur district which are drought prone, but even in these areas, the desire of political leaders to have a sugar factory of their own, never ceased, as a result of such desire, sugar co-operative have been set up in unassured sugarcane supply area of the solapur district.
In Solapur district the problems faced by sugar industry are increasing day by day along with their development.

1) **GOVERNMENT STRATEGY:**

   The government has started sanctioning licences through a political point of view without considering the production of cane, in that area. Due to this reason the sugar factory gets very less supply of cane and in the main harvest the factory gets closed within one or two days. Hence political view should not be a sufficient reason to start a factory (Yojana, July, 1992)

(1) **LACK OF HIGH YIELDING VARIETIES AND OTHER SCHEMES**

   The production of cane per hectares has reduced. The factors influencing the yield are less irrigation facilities (The proportion of area under irrigation is less) random use of water resources, less productivity of land and irregularity in irrigation. The new varieties of cane which are produce in agricultural laboratories should be circulated along with the new techniques of farming for this purpose by the agricultural universities.
2) TRANSPORT PROBLEM:

The fluid which is produced from cane must be filtered with in 24 hours otherwise it affects the production of sugar. For this purposes efficient transport service is essential. At some places the cane is transported from much longer distances. Again if cane is kept for a long period on the farms it affects the sugar content.

(2) PROBLEMS RELATED TO THE WORKERS:

In many sugar factories, there are strikes and lockouts. The workers have different demands like increase in pay, bonus, extra facilities so it is very difficult for management to see that the sugar factory operates in the proper way.

(3) DROUGHT PRONE AREA:

In recent years due to new policy in sugar production, the factories are allowed in drought prone areas also. In such areas the deficiency of water, low production of cane along with its low quality rose many problems. In fact Solapur district is a drought prone area which is economically backward and is a problem region for planners. For the development of the district many plans have been considered, but these are not successful due to hindrances. Akluj is a place where leaders have not considered the natural hindrances. They have shown that man-power and
human brain can surpass the natural hindrances and achieve the developments, as they wish. This is the main reason for taking Akluj as a case study.

(4) **AVAILABILITY OF CAPITAL:**

The minimum crushing capacity is fixed up to 2500 M.T. per day by the government for new sugar factories so that they should be making profits. For this the factory require an initial capital of Rs. 35 crores. Some times it becomes difficult to collect this amount from different sources.

(7) Sugarcane shortage.

(8) Uneconomic sugarcane prices and levy sugar porices decided by the Govt. of India from time to time.

(9) Beglect of orifessionalism in almost all functional areas of management.

(10) major part of soils are solty and logging.

(11) Low level of autination comouterisation and Modernisation in plant and machinery.

(12) Ever dependence on government for financial assistance and negligence in respect of creating own funds.

(13) widespread shifting of area from sugarcane to horticulture resulting in decline in sugarcane production.

(14) Lack of diversisification and by-product industries.

(15) Labour unrest and labour turnover due to seasonal nature of industry.
(16) Excessive labour cost due to recruitment of employees in excess of staffing pattern specified by the government.

8.3 BY PRODUCTS:

More and more sugar factories have started taking a keen interest in establishing by-product industries such as distilleries, paper plants, animal feed mills, etc., some of them, viz. Sahakar Maharshi Shankarrao Mohite patil S.S.K. Ltd., Akluj, Vithal S.S.K.Ltd.Pandharpur, Sidheshwar S.S.K. N.Solapur, Pandurang S.S.K. Shreepur are also constructing factories for further products based on alcohol such as acetic anhydride, acetone, oxalic, etc. A recent survey in this regard has revealed that the co-operative sugar sector in Solapur has ready potentiality for substantial investment in industries based on by-products.

"Bagasse, molasses and press cake form the three principal by-products of the sugar industry. These alone amount to about 40% of the total weight of cane or say about four times the weight of sugar produced from a certain quantity of cane. Bagasse alone at times constitutes about one third of the total weight of cane crushed." Proper utilization of the by-products of cane sugar can be of much help in solving the problems of sugar industry. It is worth while to note that sugar factories which are exploiting their products are economically better off then those factories.
which only produce sugar. It is a matter of experience that the economical conversion of these by products into various end products increase the return to the extent of 50 % to 60%. However, in the case of manufacture of liquirs from molasses, the returns can be to the extent of even 100% . This shows that the efficient utilization of by products has a very significant effect on the profitability of sugar industry. It has been proposed to discuss different by products of sugar industry in detail in connection with sugar industry’s development in solapur district.

VARIOUS BY PRODUCTS OF SUGAR FACTORY:

The following different by products of sugar industry in detail in connection with sugar industries development in solapur district.

i) CANE TRASH:

The necessity of organic manures in the soil has been definitely proved by many cane trash is a very important by product of sugar industry.

Today the farmers in rural areas adopt following methods in general for the disposal of cane trash.
1) Number of farmers burnt the cane trash in field. It is a common practice. The practice of burning cane trash in the fields is common on account of its being the cheapest and the easiest method for the cultivator to adopt. It was advocated on the ground of its ability to kill a number of insects injurious to the cane plant in the field. The only advantage that one gets by this system is that the inorganic constituents of the cane trash are returned to the soil for maintaining its fertility, while the more important organic constituents are being willfully burnt off.

2) In the second method, the cane trash is allowed to not in the field and after some time it is ploughed down. The experiments of this system gave successfully better results than burning it. Due to this method, it has improved the tilth of soil. The soil gets five to six times more humus by conservation of cane trash in this way. The increased yields are also obtained.

3) In the third method, cane trash is used as a bedding for farm animals and subsequently applying it to the fields as manure.

4) In the forth method, cane trash is utilized in the preparation of artificial manure. Cane trash is composted near the house. When it is composted near the factory, it is composted with filter press cake and water is allowed to
decompose. If the compost is made along with cow or buffaloe dung, the results are very effective.

ii) **PRESSMUD**:

The whole value of pressmud as a fertilizer can be attributed to its phosphate content. The production of cane wax from pressmud is well within the scope of sugar manufacturers as it can be run easily as a subsidiary industry. This will require small initial investment. The pressmud from sulphitation sugar factories contains a very a valuable component in the form of wax. The extraction of sugarcane wax from press cake gives wide scope for the development of the industry.

The pressmud is used in the following ways:

1. It is almost exclusively used for manorial purposes, on account of its phosphatic constituents, in most of the factories the cake as it comes out from the press is directly transported to the fields. In others it is stored on the factory premises in a ditch and transported later when dry. "In the Reserve central Lab, the muds coming out from the presses are mixed with water to form a slurry in a special mixer and pumped by a slurry pump through pipe lines running all over the plantation. The stable canes are thus irrigated irrespective of weather conditions. This method of utilizing
the pressmud has been found to be more efficient, as the ingredients of the mud get more, thoroughly incorporated with the soil particles."

2. Some of the factories prefer to use the mud as a road filler in place of earth, in their own premises. But this method is only of disposal and not for utilization.

3. Some of the factories utilize it as fuel in conjunction with bagasse. It is seen that the subject of economic utilization of the pressmud has not been very thoroughly investigated. There is no general procedure for its utilization which can be laid down. It is composted with cane trash and other sugar house waste liquors and subsequently utilized as manure after decomposition.

iii) **BAGASSE**:

Bagasse is the residue from sugarcane which is left after extraction of juice by milling or diffusion. The quantity of bagasse produced annually is 30 to 35 percent of cane crushed in sugar factories. "Bagasse as produced has about 50 percent moisture and used more or less in entirely as fuel for the generation of steam. Dry bagasse in general, contains 40 percent cellulose, 30 percent pentosans, 20 percent lignin and the balance of 10 percent being sugar was, minerals, dirt etc.
Bagasse is an important by-product of the sugar industry and is almost exclusively used as fuel in sugar factories for raising steam for power and process requirements. Its usage as fuel directly saves the incidence of fuel costs. Bagasse is essentially a cellulose material, but like all cellulose materials it is an impure state. It can be divided into two parts namely pith and the fibre.

The bagasse is mostly used as fuel for the factory itself, excess bagasse is collected in the backyard either in heaps or bales. They are stocked in a neat way to save the space. Baling ensures to prevent to some extent the fire hazards. Bagasse, if it is baled and stocked than fire spreads to that particular stock only.

Bagasse is used for different purposes. The various products manufactured from bagasse are, A) fibrous products in this, various types of paper are manufactured. Bagasse offers the choice as it enables production of all grades of paper. The manufacture of bagasse pulp and paper is essentially a chemical process. the cooking of bagasse for the production of pulp depends on factors namely, temperature, pressure, cooking time, concentration of chemicals etc,
"The first patent taken for the production of paper from bagasse dates back to 1838 and was issued to Berry. It is also reported that in 1844 bagasse was shipped from Martinique to France for paper manufacture.”

iv) **PRODUCTION OF FINE PAPER, WRAPPING AND NEWS PRINT PAPER:**

It is done with bagasse on a large scale.” Paper consumption in India is about 2.5 kg. per capita while it is 200 kgs. in western countries. In days to come the need for various types of paper is bound to rise due to spread of literacy, rise in population, educational institutions etc. Hence substitute raw materials for manufacturing paper will have to be sought. Bagasse is one such substitute raw material that can be used in paper production.

v) **ADVANTAGES OF USING BAGASSE FOR PAPER:**

There are various advantages in using bagasse for paper,

a) As it is available in one place, that is at factory site, the cost of collecting, cleaning and crushing etc. is lower.

b) It is put to a much better use than mere burning in the boilers.

c) It can be easily baled and stored without any
material deterioration in the fibre value of bagasse. d) The Process of conversion of bagasse into pulp is easier.

vi) OTHER PRODUCTS FROM BAGASSE:

1) FUREFURAL:

"The first record obtainable for the production of furfural from bagasse is of J.W. Dunning and E.C. Lathrop (1945). However the first extraction plant was started in 1955 at Central Ramana in the Dominican Republic". It has got number of uses in the chemical industry. One of the main uses at present is as a selective solvent for the refining of high quality lubricating oils for wood resin and vegetable oils. "Another major use is as a chemical intermediate in the manufacture of adiponitrile from which Nylon 66 is made. Further it is also used as a selective solvent in the extraction of butadiene from cracked refinery gases, but is being rapidly replaced by curprous ammonium acetate which gives a higher recovery."

2) CELLULOSE:

There is no industrial enterprise currently engaged in manufacturing a cellulose from bagasse. But number of sugar factories have demonstrated that a satisfactory dissolving pump can be made from bagasse.
3) **PLASTICS**: 

The first commercial plastic compound was developed in 1941.

4) **BAGASSE CONCRETE**: 

almost every sugar producing country has tried to use bagasse as a building material. but this process can prove useful in times of emergency. therefore this utilization cannot be recommended. a unique use of bagasse is the formation of bricks using bagasse as binder.

5) **AMMONIATION OF BAGASSE - USE AS CATTLE FEED**: 

"Millar (1941) dacrived the ammoniation of various producs like sugar beet pulp cotton seed hull, brab, maple, saw dust, flax straw and corn silage of these the sugar beet pulp gave the best result".

6) **BAGASSE AS SOIL AMENDMENT AND DEETILIZER**: 

Jamaica, compost has been prepared out of bagasse and distilling slops (1949) and was used at a rate of 20 tons, per acre. The results however have been beneficial but cannot be told conclusive."
b) **INDIRECT FUEL PRODUCTS FROM BAGASSE:**

1) **CHARCOALBRIQUETTES:**

"The production of such briquettes from bagasse, through has been tried in number of countries, Java (around 1939-41) is mainly responsible for such production at large." These briquettes are a satisfactory substitute for wood charcoal.

2) **PRODUCER GAS:**

"Producer gas plants utilizing bagasse as fuel have been built in capacities varying from 920 to 2500 cum. of gas per hour".

Bagasse can be used as a fodder on a large scale. In Sweeden this experience was carried out in 194142. "Bagasse from one sugar factory can feed 20,000 cattle every day by day using about 150 to 200 tons of bagasse which is not at all difficult in emergent situation".

3) **MOLASSES:**

Molasses has become a very valuable raw material for the chemical industry. It should be noted that it yields ethyl-alcohol, acetone, butyl alcohol, citric acid and also oalic acid. the industrial alcohol has emerged as the most viable alternative to petro-chemical based raw material.
"Molasses can be defined as the final effluent obtained in the preparation of sugar by repeated crystallization, it is the residual syrup from which no crystalline sucrose can be obtained by simple means.

Molasses is the important by products of the sugar industry. The output of molasses has been rising. "cane molasses is the product left after separating the sugar from massecuite melada, mush sugar or concrete and contains not more than 25 percent water and not more than 5 percent of ash".

The fluctuations in the production of molasses are of course the direct outcome of the fluctuations in sugar itself.

INDUSTRIAL ALCOHOL:

Alcohol (Rectified spirit) has immense usage for industry, medicine, pharmaceuticals beverages. It is economically, mixed with gasoline to conserve petroleum products. Alcohol is produced by the fermentation of organic matter. It can also be prepared from Ethylene, water, gas and calcium carbide.
It can be suggested that molasses should be collected and one optimum distillery be set up in the vicinity of sugar factories.

5) MOLASSES IS USED FOR CATTLE FEED:

The scope for the use of molasses as cattle feed does not appear to be great due to the difficulty in marketing combined with a traditional conservatism of owners of most of the cattles in India. as they are used to free grazing with hardly any expenditure on other food stuffs. It is possible to use molasses as a fertilizer in its raw state but our cultivators will have to be educated to its use and ample supplies of water would have to be provided in order to dilute the molasses before it could be put on the land.

6) MOLASSES AS FERTILIZER AND SOIL RECLAMATION:

Molasses is used mainly for the potash supply. " Dhar N.R. and Mukharji (1936) have found the use of a mixture molasses and pressmud in reclaiming the alkaline soils, According to them alkaline soils (p.h. up to 10-8) can be reclaimed by molasses " molasses forms a good source of nutrition. it is especially rich in iron.
CONCLUSION:

"It can be said that, though the industry has expanded rapidly and the level of production is higher than the domestic demand, the consumer has not benefited by way of price relief, as the sugar prices in the free market continue to rule high. While this is partly the result of a deliberate official policy to keep domestic consumption in check through higher excise duty on free sale sugar, it is also partly a reflection of the high cost of sugar manufacture. There is therefore considerable scope for manufacturing sugar more economically through the fuller utilization of the various by products of the industry. If the by products are used they would add to the profitability to the extent of 20 to 22 percent. That is the cost of sugar can be reduced by that much margin. Inspite of continuous and rapid progress of the sugar industry its by products have continued to remain neglected. Neither the technologists nor the entrepreneurs appear to be keen on the utilization of the by products. This is largely due to the lack of a viable technology to utilize the by products and uncertainties regarding the rate of return on capital invested for this purpose. The fluctuating character of the supplies of the by products is also a factor contributing to such uncertainties."

Profitable utilization of sugar industry's by products viz. bagasse, molasses and press-mud helps to minimize the
cost of sugar production. Therefore by product industry is essential to make the sugar industry viable. As far as by product utilization is concerned Shhakar Maharshi Mohite Patil o operative sugar factory of Akluj and Shri Siddheshwar co-operative sugar factory of solapur have established their own distilleries of 30,000 and 20,000 liter/day capacity respectively and produce special and ordinary denatured spirit. Shri Siddheshwar co-operative sugar factory has established craft paper plant of 13 tonnes/day capacity, and saved bagasse is being utilized for producing craft paper. But other factories dispose-off their bagasses in the market.

Sahakar Maharshi co-operative sugar factory of Akluj is a leading factory in by product industry. It has received licence from the government for establishing E.N.A. (Silent sprit) plant of 60 to 70 lakhs liter/year capacity. It has established "Mithel Gas plant" for producing Mithel gas by processing the spent wash water, and the gas is being utilized for boiler to save steam. It has also set up Acetic Acid plant of 6000 tonnes/year capacity for which 75,00,000 liters of alcohol is expected to be consumed. All the above three plants have been started in 1992-93.

The unit started
a) A Distillery plant in the year 1984-85 with a capacity of 30,000 liters per day, expended in 1993-94 to 60,000 liters per day.

b) An Acetic Acid plant in the year 1992-93 with a capacity of 6000 Metric Tonnes per annum

c) An ENA plant in the year 1993-94 with a capacity of 20,000 liters per day.


The Adinath sahakari Sakhar Karkhana Ltd. at Karmala, which has completed its process of erection of plant & machinery and expected to have its trial crushing season in 1993-94, has been selected by the Govt. for establishing o-generation project on pilot basis. This co-generation project which is first of its kind in Maharashtra. Consists of generating power and supplying it to the electricity grid after meeting requirements of the factory. The world Bank and Govt. of India has agreed to finance this project and the installation work is in process. This project leads to reduce the cost of sugar production.

8.4 **SUGGESTIONS:**

Sugarcane is the only important agro-based raw material used on large sale for the sugar industry and sugar factories are the major agro-based industries in the region.
The analytical study of the present agro-based industries leads to the following suggestions.

1. In the order to avoid adverse effects of salinity, caused by continuous water logging it can be suggested that sugar co-operatives should undertake research projects for removing water logging in their respective areas. The sugar co-operatives should make provisions for making drainage system in the salinity areas. Government could pay subsidies to members concerned.

2. It is suggested that in rural areas large sized gobar gas lant models could be installed and operated on the community basis. Sugar co-operatives should select at least five villages in a five year plan period to construct gobar gas lants on community basis. Assistance from concerned villages, Grampanchayats, primary co-operatives, dairy and poultry co-operatives should be taken in starting gobar gas plants. The representatives from all these institutions should form a committee to look after the gobar gas plants. A separate fund should be established for maintaining and operating gobar gas plants in villages.

3. Besides this, the technology for cultivation of mushrooms using agriculture residues like wheat straw, rice straw and bagasse for growing the mushrooms in rural areas of co-operative sugar factories be developed. Mushrooms being rich in proteins, minerals and vitamins, adoption or its
cultivation in rural areas will help a lot in getting a nutritious food. This may be encouraged and undertaken in the commanding areas of sugar co-operatives.

4. cane price is one of the most important considerations in accepting a new variety or new technology by the farmers. If the cane price is not remunerative the grower may become desperate. So, the remunerative prices covering all the costs of production must be paid. Then alone, he will be encouraged and will take possible care to increase the yield per care.

5. Necessary steps should be taken to impress on the minds of the farmers, the scientific use of chemical fertilizers to avoid the bed consequences affecting adversely their precious assets of land. This suggestion is particularly important because it is found that the farmers are making use of these fertilizers on a larger scale.

6. It is scientifically proved that one to two tonnes of sugarcane is sufficient for planting one acre of land. This suggestion should be borne in mind by the farmers to avoid the present uneconomic use of three to four tonnes of sugarcane for plantation purpose per acre.
7. In view of a changed trend towards inter-cropping to get current income flow, it can be suggested that the sugar co-operatives and the Government agencies should take initiative in popularizing horticultural development as an allied economic activity like other activities that are prevalent in the surveyed villages. After a period of time horticultural development may lead to forward linkages of agro-based industries like fruit preservation, canning, juice, squash, jam, jelly etc. Horticultural developments may enable the present sugar co-operatives to change the present crop pattern of the small farmers. In future supposing sugar cane cultivation becomes unremunerative horticultural development will come to the rescue of the small farmers.

8. In respect of package of information and assistance to be given, provision of one agricultural supervisor with his two assistants per ten villages be made. The agricultural supervisor should be B.Sc.(Agri.) with specialization in sugarcane cultivation. The assistants should be trained from agricultural schools.

9. "Research and Development centre" should be set up at each of the each of the co-operative sugar factories. This centre will not only provide technical guidance and undertake research in respect of sugarcane cultivation but
it will plan and control the use of fertilizers, sugarcane seeds water etc. The follow up of all these suggestions must be undertaken by the centre. Nominal charges can be deducted from the sugarcane bill of each of the sugarcane grower members.

10. On the basis of the interview and discussion the researcher had with the agricultural officers, the researcher thinks that the normal cost of sprinkler irrigation to irrigate one hectare of land is Rs. 20,000/- In respect of per acre the initial investment comes to Rs. 7,000/- to Rs. 8,000/-. This investment is to be incurred for high revolution pump, short term economy of saving of money. The sugar factory will have to propagote the future benefits.

If we calculate the cost of sprinkler irrigation per acre it comes to Rs.8,000/- considering the present rate of interest which is near about 14% he will have to pay Rs. 1,120/- as a interest per year. When we compare this with rate of irrigation charges the farmer has to pay Rs. 1,500/- for new irrigation schemes.

The lands coming under old scheme of irrigation has to pay Rs. 400 to 500/-. The real problem is whether to give priority to saving of water or saving of money. In sprinkler method 30% to 40% of water is saved. But considering the present capacity of the farmers to pay it is logical that
he will prefer to pay Rs 400 to Rs. 500/- for saving of 30% to 40% of water.

11. In case of drip irrigation the water saving is 70% as compared with surface irrigation. So in regions where water resources are limited, area under cultivation can easily be increased and problems like water logging and salinity would be no more. Even then the main difficulty with drip irrigation is besides its huge average cost per area which comes to Rs. 14000/-, the pre-requisite namely, water must be crystal clear, and there should not be impurities in the water. are not found in practice. It is doubtful whether this methods is practicable in reality. It is a field of research for the scientists to solve the technical difficulty.

Thus the sugar co-operatives along with co-ordinated efforts of Government, technical institutions and financial institutions can save the interests of the farmers and rural population. In this chapter a detailed discussion on the various by-products that are manufactured in the co-operative sugar factories has been presented.

12. Cane trash is important waste amongst the farm waste. It can be used for the preparation of compost fertilizers. It will reduce the expenditure on chemical fertilizers.
13. Green tops or cane tops can be used as green fodder throughout the season. It is suggested that it can be used to prepare animal feed on large scale.

14. Bagasse is important factory waste. It can be used for the preparation of paper and pulp. Therefore, mini paper plants are suggested in order to utilize bagasse properly.

15. Molasses is already used in distilleries but to less extent. Present availability of molasses in sugar factories is a problem. Therefore, it is suggested that distilleries should be started in all sugar factories and emphasis should be given on the production of power alcohol, so that it should reduce pressure on fuel consumption.

16. Press mud can be used to prepare different waxes which are used for boot and leather polishes. It can also replace imported wax in the country.

The consideration and implementation of these suggestions will be helpful to improve the gur and sugar industry in the region which will ultimately lead to the regional development.

The purpose of this chapter is to sum-up the main conclusion of the study to get a comprehensive view on the based of this conclusion suitable suggestions are also made
in this chapter, to change the existing situation and thereby to achieve socio-economic development in the study region.

The Solapur district excluding Malshiras, Pandharpur and N.Solapur taluka comprised of 8 talukas like Karmala, Sangola, Madha, Mohol and Mangalwedha of Central zone and Barshi, S. Solapur and Akkalkot taluka of eastern zone have been classified as a rainshadow or problem eareas by geographers. In fact these 8 talukas as compared to Malishiras, Pandharpur and N. Solapur have remained economically backward. The reasons are manifold in which notable are the problem of less planned utilization of resources due to negligence of local potentiality, poverty of people, less technonological development, declining working force and dearth of skilled workers. The development programme for the study region should be based on a comprehensive understanding of the above mentioned problems. Having considered this view point population geography of the Solapur district is studied and suggestions are put forth.

A) PLAN FOR FUTURE:

Our preceding study of the region shows that the Solapur district has very good potentiality of resources in the form of soil, climate and transport. A thoughtful long
term planning is necessary for restricting the out-flow of population.

1) **LINE OF FUTURE INDUSTRIAL DEVELOPMENT**:

In spite of certain constraints, there is a vast scope for the development of different types of industries in near future. This development of industries will stop the out-migration flow from the region. The industrial development of Solpur district relies upon its endowment of natural resources of raw material (expansion of agriculture, horticulture and sericulture). Here attempt is made to indicate the lines of future development for different types of industries.

1) Oil extraction industry: Tembhurni, Modnib, Pangari, kurduwadi, Pangaon,

2) sugarcane industry: Sangola, Madha, S. Solapur, Karmala, Mohol

3) Paper and Hardboard industry: Malishiras, Natepute, Gursale,

4) Poultry food production: Jeur, Karkamb, Velapur

5) Spinning Mills: Sangola, Madha, Malshiras

6) Industries base on pomegranate (juice making): Sangola, Akluj, Vizori

7) Grape juice wine and wine making: Akluj, Modnimb,
factory.: Kasegaon, Nanaj
8) Ber pickles industry : Sangola, Shetphal, Akluj, Telangwadi
9) Silk making factory : Akkalkot, Dudhani
10) Dairy chilling centres and by products : Shreepur, Madha, Karmala.
11) Poultry industry : Jeur, Velapur, Mahalung, Boramani.
12) Bakery industry : Pandharapur, Malshiras, Madha
14) Woolan factory : Akluj, Pandharapur,
15) Leather industry. : Magalwedha, Pandharapur, Solapur

Above all these proposed locations in Solapur district. (fig. 8.1) It is proposed that a due and thorough consideration be given to a progressive and ideal combination of both the vital resources. This combination will amount to technical development, industrial development and agricultural development which will optimumly use the local resources and will lead to the regional transformation.

The Solapur district which has been branded previously as "drought prone region" or a problem region will become a development region with greater land carrying capacity for population. The human exodus from these
spatial units will be checked and the expected exercise of human resource development will be accomplished. As discussed in the opening paragraphs of this chapter, human resource development (HRD) is to be paid a comprehensive attention in the entire framework of the Solapur district.

**SUMMARY AND CONCLUSION:**

The sugar industry is the second largest agro-based industry in India next to textile. Though the New Guinea and its neighbouring islands in the South Pacific are now widely believed to be the natural home of sugarcane. The Indian sugar industry is one of the oldest industries in the country. In fact India is considered as the original home for sugar and sugarcane. About 327 B.C. when Alexander the great invaded India, he and his soldiers were the first European to see sugarcane in India. On their return home, they took sugarcane to Europe. However, it was about 700 A.D that sugarcane was actually cultivated there. It was between the fourth and sixth century that the art of sugarcane making was discovered in India.

It is now an accomplished fact that the soil and climatic conditions of Maharashtra State are favourable for the plantation of sugarcane. The state is located in tropical belt.
This belt is famous all over the world as it consists of most suitable area for raising sugarcane crop. Majority of the countries producing sugar are situated in this belt. On account of this geographically advantageous position, Maharashtra is renounced as sugar bowl of the country.

Solapur district is drought prone region in Maharashtra State, has good potential for sugarcane cultivation and development of sugar industry.

The land of Solapur is very fertile and the climate is suitable for growing sugarcane crop. Sugar industry adds to the income of the farmers, provides casual and permanent employment, helps to earn foreign exchange and also helps to develop various kinds of ancillary and by-product industries. This leads to good industrial development and economic development of the region.

The sugar industry is the second largest agro-based processing industry in India, having certain unique features of its own. It is a seasonal industry, based on a perishable raw material, viz sugarcane with by products like molasses, bagasse etc. It has a great significance which cannot be undervalued in its relation to agriculture and industrial economy of the rural area of India. Fundamentally it affects agriculture. As such the expansion of sugar industry in Solapur is an indispensable point for the upliftment of the
socio-economic life of the rural masses, located in the rural area, it has provided the most effective instrument for carrying progressive trends into the deeper country side.

The state government was initially interested in the success of these cooperative sugar factories because on it depended the validity of its policy of advancing the cooperative institutions as an alternative to either the private sector or the completely government owned public sector. It was vitally connected with the farmers. Its tenancy laws affected the farmers who were the producer member of the cooperative sugar factories. Apart from this the state government possessed the general authority to amend the matters in regard to the cooperative sugar factories.

The growth of sugar industry in India has helped the economy in many ways. The cooperative sugar factories have played pivotal role in modernisation of agriculture and in the socio-economical and educational transformation of rural society. Taking into account the importance of sugar industry in the national economy a number of researchers have worked on the various aspects of sugar industry such as the development and problems of the sugar industry and its prospects. Similarly government policy and regional planning for sugar industry area, labour situation of the industry, impact of the industry on the lives of farmers and agriculture, the importance of sugar
cooperatives in the rural economy and such other aspects of the industry also have been probed into.

Thus, various scholars have studied the different aspects of the sugar industry separately. It should be emphasized here that whenever a particular factory is established in a region, it influences the economy of the region from all the angles. Hence, it would be better to take into consideration the impact of a factory as a whole and not by parts. In the present study, in addition to these aspects already mentioned, attempt has been made to study the growth of sugar cooperatives and its impact on economic development as a whole as influenced by the sugar factory in its area of operation.

The government policy regulates almost every aspect of sugar industry such as regulation and pricing of sugarcane, quality, storage and release of sugar stocks, control over price and distribution of by-products like molasses and alcohol, regulation of wages etc. Similarly financing of new projects of credit facilities for other purpose like purchase of cane, stock of sugar et. is severely controlled by the financial institutions and banks under overall directions from Government of India or Reserve Bank of India. Even with regard to the sale of free quota sugar, its release, trading and stocking by the traders the regulations are so severer that not much is left for the market speculation.
Sugarcane crop is grown in several rainfall, temperature and soil regions. However, Sugarcane growing area could be grouped into sub tropical and tropical belt. The temperature variation in the tropical belt is on an average 10 C to 12 C but it never drops to 5C under these conditions the sugarcane growth and accumulation of sugar continue for longer period accounting for higher yield and recovery in these states. However, between these states located in the tropical belt yield recovery various considerably due to difference in temperature, humidity, soil type, irrigation etc.

From the geographical point of view the study region is endowed favourably for the development of sugar industries. The Solapur district have reached to their present status in industrial development of the region due to the availability water, raw material, transport facilities, availability of power, labour and also due to encouragement from government of Maharashtra and to the industrial development in the region.

In present conditions it is desirable to promote the development of strong economic base to organize agricultural processing industries and to develop agro-industrial complexes in rural area along with the development of rural industrialization will not only help in the processing of
agricultural raw material and the raw materials of animal origin but also earn foreign exchange.

The region is divided into Western zone, Central zone and Eastern zone due to the physical features. In the region fertile black soils, suitable climate and availability of irrigation facilities in the Region so sugarcane cultivation increasing.

A co-operative sugar factory in the rural area or, for that matter, any agro-based large scale industry is considered a growth centre. Therefore the study of possible backward and forward linkage effects of the sugar factory assumes great significance. Sugarcane a cashcrop, being the main input for a sugar factory, the establishment of a sugar factory increases the economic importance of the sugarcane crop. It may induce increased irrigation facilities, lead to better cropping pattern and hence increase in the income and standard of living of the farmers in the surrounding region of a sugar factory. The increased agricultural income may result in the purchases of modern implement of agriculture. This should lead to the adoption of modern methods of farming. The transportation of sugarcane may provide seasonal employment during the crushing season to immigrant harvesting labourers. The changing farm technology and cropping pattern generate additional job for agricultural labour.
In sugar factory sugar is main product supplemented by a range of by products like alcohol, bagasse, pressmud etc. The Government gets more tax revenue both from direct and indirect taxes on sugarcane, sugar and on by product. The increase in trade and commercial activities requires an increase in number of commission agents and banking facilities. The sugar factory may spend on the various social services such as education, medical, aids etc.

The transportation of input and output results in the expansion of road transport facilities around the location of the factory. Thus from the input and output sides of sugar factory is expected to generate linking effect in a rural area.

The objective of the study was to assess the role of all sugar factories in socio-economic transformation in the command area in the region. i.e. Barshi and Malshiras talukas.

A brief description of the study area i.e. location physiography, drainage, soil, climate and economy is given in chapter second.

Socio economic Impact of two sugar factories as like S.M.S.M.P.S.S.K. Ltd., Akluj and Bhogawati S.S.K. Ltd.Vairag. These sugar factory selected a case study in the 8th chapter
The cruising capacity depend on two factors one is average sugarcane production and second is capacity of machinery in the organization. Average cane crushed per day at all sugar factories constantly increasing from 1975-76 to 1999-2000. In 1986 it was 1250 M.T. capacity and 1988 it was 2500 M.T. capacity indicating that the capacity is increasing. This is result of effort taken by the factory to increase the production capacity of the factory.

Average sugar recovery is shown in steady level from 1976-77 to 1999-2000. It has remained always above 10 percent which is a positive result of efforts taken by the factory, sugar production depends on three factors one area under sugarcane cultivation second average sugarcane production per hectare and third sugar recovery in percentage. Higher then sugarcane production with higher percentage of sugar recovery gives highest production. the cost of sugar depend on various factors such as transportation, harvesting of sugarcane, cost of depreciation of machinery, sugarcane recovery and payment etc.

The production of sugar and by product like alcohol by the factory has provided further employment to some people in this region. The construction of roads by the factory helped in increasing facilities for transport and communication.
By undertaking some scheme of social services the factory has been trying to promote the social welfare of the people. The factory has established a dispensary and primary schools which provided medical and educational facilities to the factory workers.

In conclusion we can say that before the establishment of the factory the cropping pattern was oriented according to the monsoon rains as well as existing irrigation facilities in which only well irrigation was significant. Cropping pattern, landuse, income of family and varieties of cash crops grown have experienced a significant change. Sugarcane has become an important cash crop, society has experienced a change in its own structure in a span of 10 years. Significant change in educational, medical facilities, drinking water and transportation in the study area are also observed.

Finally the present study has adopted the geographical approach to analyse the dynamic of agriculture and sugarcane cultivation spatio and Temporal distribution of sugarcane area under sugarcane, sugarcane production origin and development the sugar factories. spatio-temporal analysis of sugar industry. Sugarcane crushing, sugar production and sugar recovery. The problem of water
logging and sianty accumulation of the rain water for long period in the sugarcane crop. The present and future problem of sugar industry in district has also been discussed.

In view of the situation described above it is considered useful to study the socio-economic impact of sugar industry in solapur district.

In Solapur district every and each factories have by products is essencial for the profitable and development of sugar industry. There are so many problems of sugar industries in the region. Thus the various suggestion for the development of sugar industry discussed.

The present and future problems of sugar industry in solapur district has also being discussed and proposed and suggest locations in future in the district.