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CHAPTER III

LOCATIONAL ASPECTS FOR SUGAR INDUSTRY

3.1 INTRODUCTION:

Pof. Alfred weber first introduced his famous theory of industrial location in 1909, through the book Uber den Standort Der Industrien. Since then tremendous controversy has taken place on the relevant points of the theory.

The basic objective of weber theory is to find out the minimum cost location of a industry. In this theory, he tried to establish that transport cost plays a pivotal role in the selection of Industrial location. In-respective of Socio-economic and political climate of the country, the general trend of the location is universal. He denied the importance of factors other than transport cost, labour cost and agglomerating factors.

3.2 INDUSTRIAL LOCATION THEORY:

Alfred weber first introduced his famous theory of industrial Location in 1909. After the publication of weber's theory, several theories came into being. Locational analysis soon became a very important subject. Weber dalls with his location theory the hypothesis is only applicable where certain optimum conditions are available. These general conditions are as follows.
Location in 1909. After the publication of Weber’s theory, several theories came into being. Locational analysis soon became a very important subject. Weber deals with his location theory the hypothesis is only applicable where certain optimum conditions are available. These general conditions are as follows.

1. The area under consideration is having a self-supporting economy where uniformity prevails regarding land-form, weather, labour and even ability or performance of the people.
2. The perfect competition prevails in market. The demand of the product is unending.
3. The labours are static within the region. A uniformity of wage rate is necessary pre-condition of the theory.
4. Uniformity of socio-economic and political environment within the region. Raw materials very according to the weight. Some raw materials, available everywhere.
5. Transport cost increases uniformly and proportionately according to weight in all directions.

The presence of all required conditions favours the implementation of Weber’s theory. The location of the industry, as stated by Weber, will be controlled by these factors of separate nature. These factors are influence of transport cost influence of labour cost.
I. Influence of Industrial agglomeration or deglomeration.

Depending upon the nature and type of raw materials, according to weber industry selects its location. Not only raw material nature, the number of raw materials used for a particular industry also discerns the location. If only one raw material is involved in the manufacturing process, the location of the industry will certainly very within a line.

That is called linear location linear. When industry is situated between market and one raw material.

The Selection of the location in this case in entirely dependent upon the nature of raw materials and the degree of weight loss during manufacturing weber illustrated this concept in the situation of two raw materials and the market. As three points are involved in the manufacturing process, the influence area for the location should be triangular shaped.

If the raw material is impure (weight losing) how much reduction of weight takes place in each raw material. The material index of each raw material and distance of market from the raw material source decides the least cost location.
3.3 **LOCATIONAL ANALYSIS:**

The location of Sugar industry is dependent on availability of sugarcane in sufficient quantities within a reasonable distance. Thus the location of sugar industry is entirely governed by the availability of raw material. But some other factors like transportation facilities, water supply and labour supply also play important role in the localisation of sugar industry.

3.4 **ACTORS RESPONSIBLE FOR THE INDUSTRIAL LOCATION:**

The basic factor that determines the location of any manufacturing unit is the positive cost benefit ratio. The preference and relative advantage of a particular place over the others is also guided by minimum production cost.

The factors governing the location of sugar industry fall in two broad groups. These are as such.

A) Geographical factors.

B) Socio-economic factors.

A) Geographical factors:

3.4.1 **AVAILABILITY OF LAND:**

Land is a prime requisite for any industrial establishment, whatever may be the process, technique or
volume of the raw material or the product. A part from the mere availability, quality of the land-form undulating, influence the localization of the industry. The cost of the land abruptly changes with the change of economic development of the area. It has been observed that extensive plain lands are generally inhabited by dense population. The urban centres generally develop on riverine plains, which on the other hand is also preferable for industrial location.

Due to increasing cost of the land, the industrial establishments have to migrate from popular regions to sparsely populated regions. This stress and strain on the site selection is an important attribute in the locational analysis.

3.4.2 RAW MATERIAL:

It is universally true that the transformation of raw material and total value added to that primary material is the fundamental objective of any manufacturing. The influence of raw material on industrial location depends on several factors like total weight of raw material, ease of loading and unloading, perishable goods or not. The differential cost of raw material transportation from its source to the plant and finished product to the market governs the degree of
importance of the raw material. In some cases the transport cost of raw material is insignificant to the total production cost.

Sugar industry is basically a Raw material’ oriented based industry so that it is located in very close proximity to the source of raw material.

1. According to webers location theory the sugar cane as a raw material is very much impure or weight losing material. Recovery percentage of sugar from cane is only 9.12% of the total weight of the cane. Greater recovery depend heavilyistant use of the cane after its separation from the field.

2. So the material index of the raw material is greater than one. Due to heavy transport charge with increasing distance, sugar industry cannot afford a long haulage of its raw material. Hence the sugar industry are generally located within 30K.M. radius from cane-fields.

3. As a raw material sugarcane is very bulky, so its transportation is very difficult. Total transport cost often determiners the location of sugar industry in Solapr district.

4. Longer the duration after the separation of cane from the field, less will be the sucrose content in the cane. In
Solapur district sugar factories are on an average located with in 20 to 30 K.M. from the cane field.

According to available estimate, price of cane sugar constitutes nearly 55% of the total cost of sugar production. This factor also, plays decisive role to make this industry a ‘Raw material’ Oriented industry.

Sugarcane, limestone and sulphur are the basic raw materials used in this industry. Limestone and Sulphur are used in very small quantities compared to sugarcane and could be brought from other places. Out of these raw materials sugarcane is a basic raw material of a sugar industry. In this case the distance is very important. The distance between sugar factory and sugarcane is required to be low to reduce the loss of recovery due to evaporation after harvesting the cane. It must be used for crushing within 24 hours, otherwise the weight is loss and the recovery decreases. Through the factory is located within the Sugar cane zone. In general it is estimated that after cutting the Stalk the cane loses some 2.0 percent sugar content and it loses some 4.8 percent of it’s recoverable sucrose every day after first 45 hours. Thus to get higher recovery at Sucrose the Sugarcane must be taken to the factory and crushed within a shortest time. So to achieve this
to factory location be in a close vicinity of sourcre of raw materials i.e. sugarcane.

TABLE NO. 3-1

**Solapur District : Taluka Wise Net Shown Area And Area Under Sugar Cane (In Hectares.)**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Taluka</th>
<th>Net shown area (in hectares)</th>
<th>Area under Sugarcane (in hectares)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>North Solapur</td>
<td>425495</td>
<td>1900</td>
<td>00.44</td>
</tr>
<tr>
<td>2</td>
<td>Barshi</td>
<td>135606</td>
<td>4500</td>
<td>3.31</td>
</tr>
<tr>
<td>3</td>
<td>Akkalkot</td>
<td>126611</td>
<td>4100</td>
<td>3.31</td>
</tr>
<tr>
<td>4</td>
<td>South Solapur</td>
<td>107920</td>
<td>7200</td>
<td>6.67</td>
</tr>
<tr>
<td>5</td>
<td>Mohol</td>
<td>105369</td>
<td>8700</td>
<td>8.25</td>
</tr>
<tr>
<td>6</td>
<td>Mangalwedha</td>
<td>86819</td>
<td>6744</td>
<td>7.76</td>
</tr>
<tr>
<td>7</td>
<td>Pandharpur</td>
<td>112742</td>
<td>106000</td>
<td>9.40</td>
</tr>
<tr>
<td>8</td>
<td>Sangola</td>
<td>122910</td>
<td>450</td>
<td>00.36</td>
</tr>
<tr>
<td>9</td>
<td>Malshiras</td>
<td>110928</td>
<td>10935</td>
<td>9.85</td>
</tr>
<tr>
<td>10</td>
<td>Karmala</td>
<td>116442</td>
<td>1950</td>
<td>1.67</td>
</tr>
<tr>
<td>11</td>
<td>Madha</td>
<td>127409</td>
<td>1200</td>
<td>00.94</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1195311</strong></td>
<td><strong>58279</strong></td>
<td><strong>51.88</strong></td>
</tr>
</tbody>
</table>

Source : district wise general statistical information of Maharashtra office of the commissioner agriculture pune.

Table No. 3.1 The above table shows that malshiras taluka has 10935 hectares (99.85%) area under sugarcane and supports four sugar factories namely Sahakar Maharshi Sankarrao Mohite Patil Sahakari Sakhar Karkhana, Sankarnagar (Akluj)Shree. Sankar Sahakari Sakhar
SOLAPUR DISTRICT
VOLUME CHANGE IN NET SOWN

Fig. No. 3.1
Karkhana Sadashivnagar (Malshiras). The Saswad Malisugar Factory Ltd.(Pvt), Shree Pandurang S.S.K.Ltd. Shreepur (Malshiras) Pandharpur Taluka is the Second largest producer of sugarcane with 10600 hectares (9.40%) area under sugarcane in the region. It also supports Shri Vithal S.S.K.Ltd.. Venunagar and Chandrabhaga S.S.K.Ltd. Bhalavani (Pandharpur) Mohol Taluka is the third number producer of Sugarcane with 8700 hectarea (8.25%) area under sugarcane in the region. It also support Bhima S.S.K. Ltd. Takali Sikandar (Mohol). (Fig.No.3.1)

South Solapur Taluka is forth number producer of sugarcane with 7200 hectares (6.67%) area under sugarcane in the region. It also supply to shree Sidheshwar S.S.K. Ltd. Kumathe (N.Solapur) and Shree Swami Samarth S.S.K. Ltd. Dahitane (Akkalkot) and other taluka has producer of surgarcane and supply to local and nearly sugar factories.

Thus all the sugar factories in the study region are located in the Sugarcane growing areas. So the transportation required to move the sugarcane from producing area to the nearest factory ranges from 15 to 30 km. & 30 to 50 k.m.

3.4.3 CLIMATE:

Role of climate in the development of any industry has not been properly ascertained. The effect of climate on the
growth of some particular industries cannot be ignored. In some instances, climate plays vital role in the development of the industry.

The Sugarcane productivity and juice quality are profoundly influenced by weather parameters during the various growth phases of cane. Important weather parameter of three states U.P., Maharashtra and Tamilnadu representing main sugarcane and sugar producing area of the country are presented. Sugar recovery of Maharashtra records higher recoveries than the other two States.

In Solapur district the crushing period from November to March is dry with very less rainfall and low humidity and a lower daily mean temperature the nights are cooler and the sunshine hours are greater. These conditions favourable higher sugar accumulation. Solapur district is bounded by 17.10’ to 18.32’ north latitudes and south where ideal climatic condition are met with record higher sucrose levels than the other latitudinal positions. Solapur district is situated in this position and thus achieves highest sugar recovery in Maharashtra. Maharashtra has very favourable climatic condition thus the highest sugar recovery (11.92%) in the Country. Tamilnadu and U.P. are not in the favourable latitudinal position. Per hectare cane yields and sugar recovery comparatively of three important cane growing states situated in different latitudes.
Sugar Cane Yield And Sugar Recovery Of Importamnt States.

TABLE No. 3.2

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>State</th>
<th>Sugarcane yield (in M.T. Tonnes per Hectare)</th>
<th>Sugar recovery % (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tamil-Nadu</td>
<td>113.9</td>
<td>8.68</td>
</tr>
<tr>
<td>2</td>
<td>Maharashtra</td>
<td>85.55</td>
<td>11.92</td>
</tr>
<tr>
<td>3</td>
<td>Uttar-Pradesh</td>
<td>60.0</td>
<td>9.46</td>
</tr>
</tbody>
</table>

Source: Co-operative sugar May 1996.

Table No. 3.2 The above table shows that sugarcane yield and sugar recovery comparitively of Tamil-Nadu, Maharashtra, and U.P.

In Tamil-Nadu the mean temperatures throughout the year are more favourable for vegetative growth and thus the yields are the highest (113 M.T. per hectare) in the country but higher mean temperature the diurnal temperature various are narrow and relative humidity is higher and the duration of Sunshine is less. These factors are not favorable for higher sugar buildup. (8.68%)

In U.P. very low temperature throughout the year and duration of Sunshine is less these climatic condition is for not favourable for sugarcane yield and sugar (60 M.T. per hectare) (9.46% Recovery) as compar to Maharashtra and Tamilnadu. (Fig.No.3.2)
3.4.4 WATER SUPPLY:

Availability of water near industrial plants are prerequisite for some particular industries like sugar industry. The recent trend of industrial location indicates strong influence of the proximity of water source. Apart from direct use of water to the plant for drinking, drainage and all process of industrial effluent colling purpose water is regarded as one of the major ingredients for industrial growth. This the sugar industry situated near availability of water source.

Water is the soul of sugar cane and sugar industry. Sugarcane being along duration crop producing huge amount of bio-mass requires large quantity of water. In respect of the water supply position in Solapur district is divided in to three zone. (i) Western part of district covered by Bhima river and Nira river basin. (ii) Second, Eastern part of district covered by Sina river basin (iii) Third part of district covered by wells, bore wells and percolation tank. These different source availability of water use. For the sugar industry.

In the case of Wesstern zone due to the construction of Ujani dam on Bhima river there would be adequate water potential available for the utilization both for sugarcane
cultivation and sugar industry but the eastern zone will face the problem of water and as such the industries consuming high proportion of water cannot be recommended. The water supply at N.Solapur, Barshi, Akkalkot, S.Solapur, Sangola, east part of of Karmala & Madha is dependent on wells, bore wells and tanks. It will necessary to make provision for additional water supply to meet future requirement of industries at these centres. The sugar industry affects the water supply directly and also indirectly.

Solapur district belongs to the rain shadow region of the Maharashtra state, so the availability of water in the district has been very low. But western part of district the Ujani dam on Bhima river availability or water and it utilize the agriculture purpose & sugarindustry. Thus positive impact on the water has been development of sugar industry.

3.4.5 ELECTRIC SUPPLY:

Hydel power available from the Koyna project is used by all sugar factories in the study region. The major part of the fuel consumed in the sugar industry is provided by buggasse. Buggasses is a residual matter constitutes about

one third in weight of total cane crushed. Only for the initial heating of boilers some coal or firewood is used. Thus Sugar industry is self-sufficient and dependent on the
external supply of fuel sugar industries can produce thermal electricity by using buggasses to satisfy their needs. Thus proximity of a sugar factory to the source of power is not a serious point in the location of sugar industries. In Solapur district Sahakar Maharshi Sankarrao Mohite patil Sahakari Sakhar Karkhana Ltd. Akluj (Malshiras) and Adinath S.S. Karkhana Karmala these both sugar factories using buggasses and produce thermal electricity to satisfy their needs and other sugar factories in Solapur district used by hydel power electricity from Koyana project.

B. SOCIO-ECONOMIC FACTORS :

3.4.1 CAPITAL:

The capital or investment is the basic requirement for the establishment of sugar industry. The large industrial establishments require such a huge amount of money that capital accumulation from financial agencies, state governments and even from people is a regular practise. The purchase of land equipments, mashaanary,infrastructure facilities and payment of remuernation to the workers, in all kind of processes, require sufficient capital. So, role of capital in industry establishment is immense and perhaps most important.

The factory is established in the co-operative sector with farmers as the share-holders. The share capital collected from the members was Rs. 59.48 lakh. 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 different to collect this amount from different sources. The capital is not actual effective factor for the location of sugar factory but capital is the necessary to the development of the industry. However in the beginning the share capital has been collected from each farmer member in the factory area.

Industrial finance corporation of India Director of sugar industries Pune, Solapur district central co-operative Bank Ltd. And the Maharashtra State co-operative Bank. Thus the sugar factory has capital is managed from about various sources. This system of generation of capital is essential so as to develop. Sugar industry in the rural development in the gerion.

3.4.2 LABOUR:

The availability of labour is an essential pre requisite for industrial location. This condition is more applicable particularly in labour intensive industries. The cost of labour also constitutes a vital share to the total industrial expenditure.

Labour is an important factor of production sugar industry require two types of laboures, one is skilled and
another unskilled. The major part of unskilled labour is seasonal and not permanent. Skilled technical staff to run the machinery during the crushing period and his work is actual in the sugar factory. The unskilled labour is used for sugarcane harvesting, transportation of raw material. For sugarcane cutting and transporting a labours are coming from other districts mainly Beed and Ahmednagar in to Solapur district because where the droght prone conditions are much more severe. After the crushing season they go back to their home so the seasonal migration of labour is important and these labours is responsible for the improving the sugar industry in Solapur district.

Only some staff is retained even in the off season also for maintenance and repair of the machinery. Thus from the marginal workers in the region ample labour force is available for sugar industry.

3.4.3: TRANSPORTATION:

Through the influence of transport and communication has been reduced considerably in the last centuries, skill the role of transport in the location of industry units cannot be under estimated. Some of the noted geographers suggest that if other conditions remain equal, transport cost difference between the places will be major determinant in plant location. Transport cost still exerts considerable influence on the industrial location.
In weberin terminology, this industry has material index and hence is not capable of wide dispersal. Sugar cane is weight losing type of raw material, as there is great reduction of weight (90%) of sugarcane during the processing. It is a bulky raw material and to avoid unwanted expenditure incurred on transport, from long distance, therefore the sugar factories are located in the vicinity of sugarcane growing area.

As stated earlier in 6.4% sugarcane starts losing to sugar content after cutting. So prevent this loss by making the transport period short the factories are located in the close proximity of cane growing areas. In study region all 12 sugar factories are located accordingly so the distance from fields to the factories is on an average 20 to 30 K.M. trucks transport. tractor tailors and bullock-carts are used to move the sugarcane to the factories.

Thus sugarcane reaches to the factories within 24 hours after cutting. Thus time and medium of transport also act as a locational factor in study region. Efficient transport facilities are provided in the region by means of trucks, tractor tailors and bullock-carts.
There are some farmers who do the job of sugarcane cutting only, transportation is done by trucks as distance from factory is more than 30 K.M.. It is usual practice that the transport of sugarcane from the field in the vicinity that is about 10 K.M. from factory is done by bullock carts.

The time required to transport the 2 M. tonnes of sugarcane load by bullock-cart from the field to the factory is about three hours. However the waiting period at the gate of the factory ranges from 2 to 3 hours. The labourers get income from cutting and transporting sugarcane at the rate of Rs. 40 per ton per 10 K.M.

3.4.4 MARKET:

The market influences maximum the location of the industries. The declining importance of raw material and fuel in the industrial location have given a district weightage to market centres. The technology-oriented industries prefer market as location because of the easy availability of technology.

During 1930 to 1940 in this period there was no marketing problem in the beginning of the sugar industry.

By this time of 1930 there was no there Sugar factory in the western part of Maharashtra. After present expansion of sugar industry in the district, there is no marketing problem,
because demand for sugar is always more than the actual production. One fact very common in the location factors of all the sugar factories in the region is that all these sugar factories are located either very close to the south Central Railway line or to the National Highway(N.H.9). This is because sugar produced by all these factories is mostly sent to the markets of Bombay and then to the neighbouring states like Gujrat and Rajasthan.

Maharashtra always has leading share in national export and this sugar comes from all sugar factories in Maharashtra and so also from the factories located in the district. Today government policy is change sugar is not export other countries.

In Maharashtra all district has very highest sugar production but demand is very low and cost of production is high and the rate of sugar is low in market. There are many problem for all sugar factories in all district.

Today in Global level market indian sugar production is very high but cost of production is very high then this sugar is very costly as compare to other country. Thus many problems creates in indian sugar industries.
3.4.5: GOVERNMENT POLICIES:

The Government of the countries are more and more paying increasing attention to the industrial growth and selection of locations. The Government of Maharashtra has given more facilities and assistance to this sugar factory. As stated earlier the state government has given financial help as per co-operative rules.

The Technical assistance is also given to this factory by the state government and government agencies like I.F.C.I or director of sugar but the most important help from the government is of infrastructural facilities like electric supply and water supply. National Highway with other roads are available for transportation. All these facilities have not only helped the erection but have also helped the quick development of sugar factory.

According to government policy the number and the production of sugar factories in Maharashtra has increased sharply in the last two decades. It is decided in every budget of the state Govt. To establish some new sugar factories in rural area. Therefore capital management for the factory is mainly done by The government. Shri. Gadgil at policy level and Padmshri Vitthalrao Vikhe Patil at implementation level who have initiated the sugar factory on co-operative basis at Pravaranagar in 1948. Since then the development of the
capital management for the sugar factory has been systematically done by the government and financing bodies.

SUMMARY:

From the geographical point of view the study region is endowed favourably for the development of sugar industries. The aim of regional planning would affect a balanced economic development of different parts of the region. The location of sugar industry is dependent on availability of sugar cane in sufficient quantities within a reasonable distance. Thus the location of sugar industry is entirely governed by the availability of raw material. Solapur district have reached to their present status in sugar industry development of the region availability of all geographical factors like land, raw material, climate, water supply, electric supply and socio-economic factors like capital, labour, transportation, market, Government policy all these factors responsible for the localisation of sugar industry in Solapur district sugar industry is basically a raw material oriented based industry so is located in very close proximity to the source of raw material. As a raw material sugarcane is very bulky so its transportation is very difficult. The distance between sugar factory and sugarcane field is required to be low, to reduce the loss of recovery due to evaporation after harvesting the cane. It must be used for crushing within 24 hours, otherwise the weight is loss and
recovery decreases. Thus the sugar factory is located with the sugarcane zone.

Inally from the above discussion the Solapur district we come to conclusion that carrh detailed study of locational apect for the development of sugar industries and to examine the factors in the present conditions in study region.

This brief summary of the factors forming the bases for location of sugar industries in the study region is made in this chapter with a view point to present a broad concass of reasoning.
REFERENCES


