CHAPTER II

PROGRESS OF SUGAR INDUSTRY

"Sugar is the name of a large group of substances which together with the starches, are made up of carbons combined with hydrogen and oxygen in the ratio of two atoms of hydrogen to one atom of oxygen, this being the proportion in which they occur in water." Sugar is widely distributed in nature, being manufactured by plants, during the process of photosynthesis. It is also found in many animal tissues. The formation of sugar within tissues of plants is one of the most obscure problems of vegetable economy. The soluble carbohydrate commonly found is 'Glucose' or as it is often called Dextrose or Grape sugar. While Glucose is a migratory product, which affords material for the building up of the tissues, the cane sugar is a RESERVE MATERIAL stored up for some future effort of growth on a large scale. In our own language glucose may be called the sugar CURRENCY of the Plant economy, and cane sugar only the BULLION or the banking reserve. The Indian Famine Enquiry Commission, 1945, observed that although sugar was a carbohydrate food, with no protein or vitamins, it supplied calories and since there was much under nutrition, calories were needed. The following is the correct observation of the Commission:

"Sugar is one of the cheapest, most universally used and palatable sweetening agent of proved high calorific value unique for quick conversion into energy, contains 100 per cent carbohydrates and its value as a prime and vital food is enhanced due to shortage of carbohydrates in general all over the world."

Sugar in the last hundred years has furnished perhaps the best recorded example of demand created by supply. Its elementary value is not new, but (it became cheap, it was practically not available as food. Upto the 19th century, it was regarded more as a (1). SUGAR - Geoffry Fairroe, 1925. page 8
to a primitive earner. At the commencement of the 19th century, the methods of converting the cane juice into raw sugar and the process of refining the raw sugar were very different from what they are today. Alfred Fryer patented in 1855 an apparatus known as FRYER'S CONCRETOR. It produced sugar in the form of a solid mass, which eliminated loss of drainage.

The vacuum pan was invented by EDWARD CHARLES HOWARD in 1813. The next development in sugar refining was filtration. Originally, it was effected by passing it through a cloth. It was replaced by 'bag' filters. The principle of filter press seems to have been originally patented by NEWMAN and KITE in 1853. The use of the animal on rocal for refining the liquor was first discovered in 1812. This was followed by the idea of using the centrifugal force to separate sugar crystals and syrup. The Centrifugal machine was originally invented by PEGOLOTTI in 1837 and was used by SCHOTTLER in a sugar factory in Badenberg. The first British patent for the application of the principle of centrifugal force for the separation or dispersion of molasses from sugar was taken out in 1843. In 1850, HENRY BOSSERT patented the methods of suspending the spindle of the centrifugal machines with rubber buffers, to allow for movement. Centrifugal machines were first used in the Continent in 1875 and by DUNCAN in London, in 1876. The use of the centrifugal machines reduced the drainage losses to 50 per cent and also as stated in the manufacture of pure white crystal sugar.

At a time, when the Western countries were thinking of adopting ways and means to improve the manufacturing of white sugar.

(2) Dictionary of Economic Products of India - C. Watt. Pages 15-16
from cane, it was found that no other single country, was producing so much sugar as the East Indian Peninsula. The annual production here was estimated to be between 30 to 40 lakh tonnes, and some placed this figure even at 50 lakh tonnes. However, the produce consisted of evaporated cane juice, called 'Jaggery' or 'gur'. In addition, India also imported refined sugar and spent a large amount of foreign exchange on it. Sugar imports were 5,62,599 cants in 1871-72, 9,82,286 cants in 1881-82 and during the period from 1891 to 1892, total sugar imported was 27,34,421 cants. Although, India possessed large quantities of sugarcane for the production of white sugar, sugar industry did not develop here. It is also shocking to find that in 1918-19 and 1919-20, India spent an amount of Rs. 15 crores and Rs. 22 crores respectively on the import of sugar—a thing which already existed in the country. In 1921-22, India again spent Rs. 27 crores on sugar import, which fast itself gave a deadly blow to the development and economy of the indigenous sugar industry.

The first attempt to improve the economy of this industry was made by the East India Company, when they seemed to take interest in developing trade in sugar in the latter part of the 18th Century. In 1791, they gave 600 bighas of land to Lieut. Patterson for the cultivation of sugarcane, but the scheme did not progress well. In 1793, Mr. Edward Campbell was allowed to establish sugar works in Andras, but the experiment did not succeed. In 1829, Mr. C.H. Blame established the Dheba Sugar Works in the Burdwan district in Bengal. This was the first sugar factory in India in which steam power was used for extracting cane juice. This also failed after 2 years. Again in 1830-32, Mr. T.P. Henely, embarked upon a similar project on a minor scale at Barripore—a locality bordering on the Ganges.
in the Southern parts of the district 24 Parganas. This was also a 
failure. However, the emancipation of slaves in the British colonies 
in 1833 and the equalization of duties on the East and the West Indian 
sugars in 1837, assisted in the establishment of this industry in 
India. A number of factories were started but none of them proved 
successful. A lampoon of the time thus describes their failure:

"The Sugar King stretched out his hand 
talked of the cheapness of labour and richness of the land, 
of twenty nanoks a bigha 
take 5000 from the naught, divide the 10 by 2, 
the result will be the product exceeded but by few 
thus things went on right jolly, 
till the district was dotted over with moments of folly".

According to the Statistical Tables relating to British India 
1890, there were in India, 12 large and 81 small sugar factories 
with a capital of Rs. 28,26,000/-. Bihar had the largest 
concentration of sugar factories and refineries. In 1886, there 
were 236 factories and refineries in India while in 1900 the number 
dropped to 203. According to the Blue Book, the number of working 
factories (all sizes, large and small) in India during 1897-98 was 
96. With the exception of about 14 large establishments situated in 
the districts of Madras and Bengal, there did not exist any sugar 
factory with modern machinery and ap licenses but it was anticipated 
that the modern machinery and methods would ultimately secure a 
footing. Although there were no regular sugar factories in Uttar 
Pradesh at that time, the State had got the largest annexed under 
sugarasses.

A study of economic development cannot bypass the role which 
traditions and institutions play in the process of economic growth.

Investigations undertaken have proved that these institutional arrangements.

(4). The Bengal Sugar Planter, 1849 - Robinson J.H., pages 103-107
(5). The Sugar Industry of Indo-Gangetic Plain L. & J. 1925, Vol.XVII 
pages 527-535
stood in the way of a more rational use of available resources, and they in fact offer the main explanation for the slow progress of many industries, including the sugar industry in India. In fact the religious and social customs of the Hindus stood in the way of the progress and the introduction of modern methods in the sugar industry of India. The manufacture of white sugar then remained a primitive minor industry. Attempts for the establishment of larger undertakings were, therefore, unsuccessful and the following observations made on the working of this industry were not without any foundations:

"India ought to be the greatest sugar industry on earth. Religion up to now has kept her from obtaining this goal. That appears to be a strange and elusive statement. It is nevertheless true. The Indian Sugar Industry has a great future; the soil is here and the labour to work it. All it needs is intelligent direction". (6)

**Sugar Industry in Uttar Pradesh:**

The history of the Gorakhpur Sugar Plantation does not differ materially from that of Lower Janal and Tirhut. In 1889, H.S. J. Travers and some approached the Secretary of State for India, for the establishment of vacuum pan sugar factories, on a large scale. It met with opposition in India except from Mr. Pinuncane, who was then the Director of the Department of Land Records and Agriculture, Bengal and Mr. J.P. Godridge, Director of Land Records and Agriculture, Central Province. Mr. Pinuncane opined that with cheap labour and abundant sugarcane, it was possible to rout out the Mauritius sugar from India. Similarly, Mr. Godridge advocated that the soil of Northern India was suitable for cane cultivation and the establishment of Central Sugar Factories. The establishment of the sugar factories in Uttar Pradesh did not have a smooth sailing, as the Director of Land Records and Agriculture Uttar Pradesh (then North (6). *India’s Religious Sugar Industry* - S.C. Bhueg - The Planter and Sugar Manufacturer, 1927, Vol.LXXVIII No. 21. Pages 488-9.
West Province) did not favour this idea. He apprehended suspicion that the sugar industry established on the European pattern would not be appreciated by the Indians and as an example, he quoted the uneconomic functioning of the Rosa Sugar Works, which was running the establishment by the income accrued from the sale of rum and not from the profits accruing on the 'white sugar' produced by it. Thus the sugar refining remained the only important industry in Uttar Pradesh. However, in 1910 an Industries Department with a Technical laboratory under an Industrial Chemist, was set up at Kanpur. The Great War 1914-18, gave stimulus to the industrial policy of the Government and Technical Institutions were opened in 1915-16. Further, a Board of Industries was established in 1914, a Technical Institute was started in 1920 and the State embarked upon the path of industrialisation.

By this time, Indian capitalists also erected 2 sugar factories. The UWAU sugar factory was managed by H/s Moh. Chand Furlidhar of Kanpur and the other by H/s Gauridutt Tulsi Ram. Similarly, a big concern was started in Rampur; a small factory was established by the Superintendent of the Tarai and Bhabar at Khatima, while the Court of Wards Co-operated with the Department for the establishment of a sugar factory at Bareilly. Further East, a factory at AGHNI at Sultanpur was started by the Government while a small factory worked privately at Zafarabad in Jaunpur. The Sugar factory assembled for the Raja of Chandpur in Rai-Bareilly could work only for a short while for want of sufficient quantities of cane. At the same time, sugar factories were assembled for His Highness, the Maharaja of Benaras, the Raja of Mahmudabad and K. Kushpal Singh of Kotla in Agra. Thus the whole state underwent a
feverish activity for the manufacture of white sugar. At the same time, a training centre for instructions in sugar making was started by the Uttar Pradesh Government at Partapgarh.

Although the State Government gave incentives to the capitalists for starting sugar factories in the State, they were reluctant themselves to enter in this business, as most of the factories were running un-economically at that time. It was, therefore, under these circumstances that in 1911, Pt. Kedarnath Malviya moved a resolution in the then Imperial Legislative Council recommending that the duty on imported sugar should be so raised as to make it possible for the indigenous sugar industry to survive the competition to which it was exposed. Simultaneously, Shri Godhale moved an amendment recommending that the Government should order an enquiry by a Committee of competent persons into the prevailing conditions of the sugar industry in India, with a view to saving the industry from the threatened annihilation. Both the resolutions and the amendment were lost. But in November, 1911, the question of the development of the Indian Sugar Industry was considered by the Board of Agriculture in India, and as a result of its recommendations, a Sugarcane Expert and a Sugar Engineer was appointed. The Cane Expert was posted at Coimbatore in Southern India and the Sugar Engineer was posted in Uttar Pradesh. Sugar engineer was posted in this State as the Government was confident that more than half of the sugarcane grown in India was in this State and it was not only vital to locate the sugar industry here, but it was also calculated to run the industry economically in this State. Sr. H. H. L. B was appointed the first Sugar Engineer, and an Experimental Sugar factory was also

(7) Administration Report of the United Provinces of Agra and Oudh, 1908
established at Kanpur, to give practical assistance to the factories established for the manufacture of white sugar.

The first Central Sugar factory entirely owned and worked by the Indian labour and capital was established at Filibhit. It experienced difficulties in working and the Sugar Engineer estimated that with the replacement of the machinery costing about Rs. 60,000/- the factory would be able to run economically. State Government advanced a loan of Rs. 30,000/- for effecting improvements in the factory and one of the conditions of the loan was that the factory would receive and train apprentices approved by the State Government, in the methods of sugar manufacture. In 1912, the proprietors of the Bhubhanuli Indigo concern in the Gorakhpur district approached the State Government for the grant of Rs. 7 lakhs' loan on the security of their estate, for starting a Central Sugar factory. The Government at that time was already disturbed over the affects of the imported Mauritius sugar in this area, where the production of sugar or gur was in fact an important factor in the rural economy and where a decline in the sugarcane area was followed by a reduction in the poppy cultivation. The area was well suited for the growth of cheap sugarcane and the factories including Rosa Sugar Works, drew their cane supplies from this region.

In the circumstances, the Sugar Engineer inspected the location of this concern. It was found that it had an excellent barn building and a well equipped agricultural machinery. It was situated in the Bhat area and shortage of cane supplies were not anticipated for the factory. Its location and its working were found to be most economical, as it was satisfying the geographical conditions for the location of the factories. A loan was, therefore, sanctioned in favour of this concern. But this concern formed a company in England under the name of 'The United Province's Sugar
Company Ltd., and started manufacture of the vacuum pan sugar in the (9) state without taking any loan from the Government. This enterprise was accompanied by others at Japaha, Pursea, Barnowrah, Barrah and Partabpore, all of which remain and operate as successful concerns. A 'Sugar Corporation of India' was formed by V/S Tata of Bombay, to exploit the sugar resources of the country. It was anticipated that with the experience gained, other capitalists would be tempted to turn their attention to the large areas, where sugarcane was grown north of Ganges. The Corporation was of the view that this great tract comprised the main sugar region of the country, and it was not likely that this distinction would be altered for some time. The optimism held by the Corporation proved true as by the end of 1920, 16 Central Sugar factories had been established in India which manufactured sugar directly from sugarcane. 9 of them were situated in Bihar and Orissa, 5 in Uttar Pradesh, 1 in Assam and 2 in Madras. This meant that 16 out of 18 factories were established in the Indo-Gangetic plain which possessed the alluvial soils suitable for sugarcane cultivation.

In accordance with the data available regarding the existence of the large scale industries in India, there existed 16 sugar factories in Uttar Pradesh in 1921, which were driven by mechanical power. Out of them, 6 were central sugar factories crushing cane and the rest were refineries which collected gur and refined it into white sugar. In 1923-24, five more modern sugar factories and refineries, situated at Bantai and Unnao in Uttar Pradesh, at Pachrumpi and Buxur and at Madanipatnam in Madras, began to work. By this time, India had 23 factories which manufactured white sugar direct from cane. Of this 11 were situated in Bihar and Orissa, 8

(9). Report of the Royal Industrial Commission, 1916-17
Page 41.
in the United Provinces of Agra and Oudh (now Uttar Pradesh), 2 in Madras and 1 each in Assam and Bombay. By 1929, the number of the working sugar factories in Uttar Pradesh and Bihar had risen to 18 as follows:

<table>
<thead>
<tr>
<th>Factories</th>
<th>Capacity</th>
<th>Number</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short tonnes of cane per hour</td>
<td>Rollers</td>
<td></td>
</tr>
<tr>
<td>1. Cawnpore Sugar Works Barhounrah</td>
<td>20</td>
<td>14</td>
<td>Carbonation</td>
</tr>
<tr>
<td>2. Behar Sugar Works, Pachrukhi</td>
<td>20</td>
<td>11</td>
<td>Carbonation</td>
</tr>
<tr>
<td>3. New Sawan Sugar Factory, Saran</td>
<td>15</td>
<td>12</td>
<td>Sulphitation</td>
</tr>
<tr>
<td>4. Bihar Sugar Company, Seppaul</td>
<td>10</td>
<td>8</td>
<td>Sulphitation</td>
</tr>
<tr>
<td>5. Darbhanga Sugar Company, Lohat</td>
<td>25</td>
<td>8</td>
<td>Sulphitation</td>
</tr>
<tr>
<td>6. Jay Sugar Company Rayam</td>
<td>20</td>
<td>11</td>
<td>Carbonation</td>
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<tr>
<td>7. Samastipur Central Sugar Company Samastipur</td>
<td>20</td>
<td>14</td>
<td>Sulphitation</td>
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<tr>
<td>8. Chapram Sugar Company, Chakia</td>
<td>25</td>
<td>17</td>
<td>Carbonation</td>
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<tr>
<td>9. Japaha Sugar Factory, Japaha</td>
<td>15</td>
<td>8</td>
<td>Sulphitation</td>
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<tr>
<td>10. Purra Sugar Factory, Purra</td>
<td>15</td>
<td>11</td>
<td>Sulphitation</td>
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<tr>
<td>11. United Provinces Sugar Co., Tekki</td>
<td>20</td>
<td>11</td>
<td>Sulphitation</td>
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<tr>
<td>12. Cawnpore Sugar Works, Gauri Basar</td>
<td>10</td>
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<td>Sulphitation</td>
</tr>
<tr>
<td>13. Purthapore Sugar Factory, Purthapore</td>
<td>20</td>
<td>11</td>
<td>Carbonation</td>
</tr>
<tr>
<td>14. Saraga Sugar Factory, Chauri-Chaura</td>
<td>10</td>
<td>8</td>
<td>Sulphitation</td>
</tr>
<tr>
<td>15. Padumra Rajkrisna Sugar Works Ltd., Padumra</td>
<td>15</td>
<td>8</td>
<td>Sulphitation</td>
</tr>
<tr>
<td>16. Bansi Sugar Factory, Bhatni</td>
<td>25</td>
<td>11</td>
<td>Sulphitation</td>
</tr>
<tr>
<td>17. Lall Bros. Sugar Factory, Pilibhit</td>
<td>N.A.</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>18. Noko Sugar Factory, Shanahanpur</td>
<td>N.A.</td>
<td>N.A.</td>
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</tr>
</tbody>
</table>

Source: International Sugar Journal, 1935, Vo. 24

In these factories, the average yield of sugar from cane was 6.5 per cent, although some of the factories had obtained a yield of 8.9 per cent also. The number of the sugar factories in Uttar Pradesh rose to 13 in 1929-30. At that time, the overall number of factories in India was 27. Out of this, 11 factories were working in Bihar and 1 each in Assam and Bombay. These factories produced 89,768 tonnes or 24,433,456 maunds of white sugar, direct from cane.
In 20th May, 1930, an enquiry into the grant of protection to the Sugar Industry in India was referred to the Tariff Board. The Board considered that the agricultural aspect of the case was the most important and held that it was essential in the National interests that the area under sugarcane did not diminish and that a fresh outlet was provided for cane to encourage the expansion of the white sugar industry. They appreciated that unless steps were taken to develop the white sugar industry, the 'gur' market could face a slump, which could seriously affect the agricultural classes, disorganise the agricultural system and even involve the abandonment of the better cane cultivation. The Tariff Board was satisfied that the three conditions laid down by the Fiscal Commission were fulfilled by the Sugar Industry, and recommended that the Industry should be granted protection for 15 years from 1931. They proposed a protective duty of Rs 7.25 paisa per CWT for the first 7 years and Rs 6.25 paisa for the remaining period of protection (11) and this was accepted by the Government of India.

Under the shield of protection, the number of vacuum pan sugar factories in Uttar Pradesh increased to 34 in 1932-33 and to 74 in 1936-37, including 2 mills in the late Rampur State. The details of these factories are given at Appendix I. By 1950, there were 73 central sugar factories in Uttar Pradesh (including the Experimental Sugar Factory at Kanpur). Out of these, 3 factories had a crushing capacity of less than 400 tonnes cane per day and another 19, less than 500 tonnes a day. Further, the sugar mills at SAINI, JHUNI, BHARELI, GOKULNAGAR (KISHA) and SAINALPUR did not work during many seasons. The sugar factory at Siswanbazar had a

crushing capacity of 80 tonnes cane per day only. All these factories are mainly situated in the rural areas which are adjacent to the sugarcane fields. These usually crush 'gate cane' which ranges up to 35 per cent of the total crush of the factory. The Western Uttar Pradesh had the largest concentration of sugarcane fields and out of a total of 66 working factories, 37 were situated in this region. On both sides of the C.T. Road, there are cane fields even now and the sugar factories are situated just near them. Thus the sugar factories at Hodinagar, Schiuddingar, Secrut, Deorala, Sakhoti Tanda (Diwan Nagar), Khatauli, Mansurpur, Havan etc., are situated in the heart of the cane fields. This is not so in East Uttar Pradesh, where sugarcane has been found to be less than the requirements of the sugar factories established there.

By 1951, that is the eve of the First Five Year Plan, there were 138 sugar factories in India and 67 of them were located in Uttar Pradesh. India then produced a total of 11,95,000 tonnes white sugar and the Uttar Pradesh contributed 5.9 lakh tonnes sugar towards this total. A total productive capital of Rs. 48,70,99,228 was employed in the Indian Sugar Industry at that time and Uttar Pradesh accounted for Rs. 31,75,62,604/- in it. This meant that although the capital employed in the sugar industry in Uttar Pradesh was about 65 per cent of the total Indian investment in this Industry, return obtained by it was just 50 per cent of the total Indian production. This showed an un-economic return on the capital employed in these factories in this State.

Again, the sugar industry in this State reveals many distinctive features in its evolution and organisation. Most of the

Industrial units in this industry sprang up under the shelter of protective tariffs and without much regard for their competitive efficiency or economic working. Most of the industrial units that came into existence after the thirtieth of this century, had a cane crushing capacity of 400-500 tonnes per day. One of the reasons of these small-sized units was that the Sugar Industry was mostly pioneered, nurtured and organised by businessmen of moderate means, who had great organizing ability like Saranga, Degg Sutherland and Govans. Further, in this industry, the tendency towards multiple directorship was not so pronounced as it was in the Jute or Cotton Industry. This industry followed the managerial system.

The growth of the sugar factories in this state was not scientific, well planned and did not satisfy the general conditions that the industries should be located with regard to their transport relations, geographical and economic factors. The location of sugar factories was not much influenced by the proximity of coal or water power and the only consideration kept in view was, that it should be located at a place where sugarcane would be found in abundance within a reasonable distance. Yet this principle was not strictly observed in certain cases at the time of the installation of the sugar factories in the state. Sites for sugarmills were selected hurriedly and even two mills were established at one site, for example, Pipraich and Dimond sugar factories in Gorakhpur district and Raza and Aulund in Ramgarh.

The Eastern Uttar Pradesh comprising of Barewa, Gorakhpur,

(13) The Economics of Location, 1959. William H. Pogran page 237-95
(14) Indian Industries, Development and Location, 1962 -
      *K. Chaudhri - page 114
astti and Gonda districts, did not have favourable climate for a
good quality cane, but even then about half of the total sugar
factories of the state were started in this tract. As against it,
totally different conditions prevailed in the Central and the
Western districts of the state. The Western Tract actually
suffered from excessive cane, so much so that the factories
situated there, in certain seasons did not find it possible to
consume all the sugarcane produced there, and inspite of these
factories achieving much longer duration of season and having see
higher cane-crushing capacity, growers were still left with
sugarcane in the fields at the end of the crushing season. Many a
times, these factories had to be given some incentive to carry on
the crushing season beyond the normal period, so that the standing
canes could be harvested from the fields. Besides, there were
several places in this tract which were ideally situated in
respect of cane cultivation and actually producing cane in
abundance, but no sugar factory had been established there.

It has been found that some factories were badly located
from the point of view of cane supplies, the deficiency being
occasioned by the proximity of other factories or the congestion
of the cane zones. In East Uttar Pradesh, two factories 'Diamond
Sugar Mills' and 'Mian Sahib sugar factory', were located at
Pipraich. These mills were situated within half a mile of one
another, with Sardarnagar sugar factory 11 miles to the South and
Captainganj sugar factory, 13 miles to the North East. The cane
zone of the Mian Sahib factory extended almost to the town of
Gorakhpur in the South and had a common boundary with that of the
Diamond factory in the North. The cane zone of Diamond factory
bordered on that of the Captainganji factory. The Mian Sahib plant was small having a normal crushing capacity of only 317 tonnes of cane per day, consuming about 10 lakh mnds of cane a season. The factory was granted a licence to increase its capacity to 650 tonnes cane per day and this raised its sugarcane requirements by 10 to 15 lakh mnds per season. The average cane yields in the Gorakhpur area were not favourable and a total cultivable area of about 36,000 acres was not capable to provide the entire crop of 25 lakh tonnes cane for this factory. In comparison to this factory, the Diamond sugar factory was crushing a crop of about 30 lakh tonnes a season and was maintaining itself in a good economic condition. It was observed that given a chance the latter factory could have a smooth and economic running even with the expansion of its capacity. It was, therefore, decided to give a chance to the Mian Sahib factory and the Mian Sahib factory has now been shifted to some area in Andhra Pradesh in Southern India.

Similarly two factories were closed at Deoria in the Gorakhpur district. One sugar factory known as Deoria (S) had a small plant, with a normal cane crushing capacity of 351 tonnes a day and was situated near the Railway Station. The other factory known as Deoria (T), a much larger plant with a normal cane crushing capacity of 837 tonnes, was located at less than a mile away from Deoria (S). Baitalpur sugar factory was situated 6 miles away from the East, and had a normal capacity of 851 tonnes cane per day. Cane shortage existed in the Deoria neighbourhood due to the proximity of 2 factories and the shortage was also reflected quite substantially at Baitalpur. Although Gauri Bazar sugar factory was situated 12 miles to the East of Deoria, its cane supplies were
also some times affected. Acute shortage of cane existed in this region and at times cane areas had to be allocated and re-allocated between these factories with a view to improving the cane supply position but this re-allocation did not provide any permanent solution. This solution was all the more naïve difficult as the crops in this area fell short of the standard crop requirements of these factories and this factor alone made the functioning of these factories uneconomic.

Again, 2 factories known as 'Raza Sugar Company' and 'Bulund Sugar Company' were established at Rampur and were situated just a few yards apart. Both the factories are under the control of the Managing Agents, that is, Gowan Brothers, Rampur. These mills were getting their cane supplies uninterrupted, but it was felt that if Raza sugar company could be shifted to some other State, its cane supplies could be diverted to the sugar factory at Raja-Ka-Sheahrur, which was situated at about 32 miles from Rampur. There was a good development of roads in the districts of Bijnor, Moradabad, Rampur and Bareilly and the carting of cane to other sugar factories would not have posed any problem. The factory was not shifted to any other State, but these two factories amalgamated themselves into one unit.

Some factories were badly located with regard to their cane requirements, the deficiencies not being occasioned by the proximity of other factories or the congestion of the zones, but by unfavourable local conditions such as poor soil, lack of irrigation facilities, unfavourable climate or shortage of cultivable land. In such circumstances, cane development has made it possible to provide adequate cane supplies to these factories, but in the case
of others there is no hope of achieving the full requirements. Two
factories have voluntarily moved from the deficient areas. Those
were 'Sutaiya and Aishbagh', which shifted respectively from
Kanpur to Nasadha, district Fyzabad and from Lucknow to Bara-banki,
during the year 1925. The 'Pannijee Sugar Mills' have also shifted
from Tarai Area of the State to Bulandshahr, in the Western Uttar
Pradesh.

The following factories are situated in areas where questions
arise in respect of each not obtaining full cane supplies on account
of local short comings or difficulties. In addition, there may be
other sugar factories in somewhat similar circumstances, but whose
positions have not been investigated:

(a) Boiwa, Bhakar and Saharanpur:

The three factories Boiwa, Bhakar and Saharanpur are
situated at points of a triangle approximately 35 miles apart towards
north west of the State. Although, there is an interaction in their
cane supplies such that the crops of each are restricted by that of
the other, the region cannot be considered as congested on account of
long distances between the factories. The area in which each factory
is situated is unfavourable for providing an adequate supply of
sugarcane and all are, therefore, dependent to a large extent on
distant canes, and it is in this respect that competition exists
between them.

Boiwa is situated 12 miles South of Dehra Dun at an
elevation of approximately 2000 ft. It is too up in the flat hills
to obtain 'Gata cane'. About 50 per cent of its cane requirements
are brought from two centres, Pathri and Janalapur, 30 and 25 miles
away in the plains near Hardwar. Although these centres are such
nearer Bhaker, being respectively only 8 and 13 miles away, their supplies have since 1939 been largely diverted to Doliwala, in order to relieve deficiency there. The factory usually recovered 8.5 per cent sugar from the cane crushed by it.

The area around the Bhaker sugar factory is unfavourable for obtaining a satisfactory gate cane. There is an isolated cultivable area around the factory within roughly 2½ miles radius which is unfortunately not much irrigated and can give only about 3 lakh mounds of cane. Roads were not in a very good condition and made it difficult to use cart transport. Starting from 3 miles north of the factory to Patrhi, forest occupied an area of about 20 miles and was surrounded by swamps. The Sengamba river flows past 5 miles away, the banks of which are mainly marshy land subject to flooding. The Bolani river flows in a similar manner only 3 miles to the west of the factory. It spreads out into a large water-logged area before its confluence with the Ganges. The above topographical feature isolates the factory leaving only a small area for 'gate cane'.

Bhuranpur factory appears to be situated in a more favourable cane locality than either of the other two mills. The proportion of rail cane is less here. The Eastern Susra canal passes through its area providing irrigation facilities to the cane zone. The adjoining countryside is not so broken as in the case of Bhaker. The recoveries of both these factories have been as reasonably higher than that of the Doliwala factory. The latter factory was placed under the control of the Government of India, as it was not running economically. A Controller was appointed to look after its interests.
(b) HARROI, ROQA AND NAHOLI.

Sometimes back, it was brought out by the Roman Sugar Works, that competition for cane existed between these three factories, which are situated in a triangular shape in the centre of the state. The distances from Naholi to Rosa and from Rosa to Harroi are 25 miles respectively and from Harroi to Wholi, 30 miles. On account of relatively long distances, the factory zones are not congested, but competition is being felt for rail borne cane which is bought by the factories, to make up for the deficiencies in the gate cane.

Roman sugar works is an old established factory which has been on the present site for the past many years. The plant had been somewhat congested and poorly arranged. The performances of the factory were only moderate and the recovery of a gan was also 35 per cent in certain seasons. The shortcomings of the factory are compensated by the distillery operated by the proprietors on the same site. The brands of potable spirits produced by this factory have a well established market in India.

The crops of Naholi and Harroi have been more than double of Rosa and the percentage of rail borne cane relative to the total crops of these two factories, is much higher. It is obvious, therefore, that between the two factories absorbed the major part of the rail borne cane of the region.

The nature of cane competition did not appear to be seriously reported by both these factories, but this may of course, have been due to the fact that these factories were getting the cane supplies they actually needed. At Harroi, the management maintained that their deficiencies in crop were due entirely to the lack of cane development in their zone and that as it is well
Indiased by canes and served by numerous roads, it should be able to develop the quality of the cane cane received, even to the extent of becoming independent of mill cane cane. The natural cane of Lucknow and Hardoi factories was 1250 and 1560 tonnes per day and they were consuming 35 to 41 lakh mounds of cane respectively per season. Their capacity has been expanded to 1600 tonnes or 1250 m.t. tonnes per day and each of these factories are supposed to crush about 50 lakh mounds or 13,60,000 qts. of cane per season. Some sugar works have also increased its capacity.

The average yield of cane in the state is not so high as enable the crop to be produced from the existing acreage, and there is bound to be some difficulty in the procurement of cane supplies if the factories are to crush to their maximum capacity.

(c) In 1939, a sugar factory was started at KICMA with a milling plant of 12 rollers 30" X 60". The capacity of the factory and the size of the crops were in no way in accordance with the size of the plant, and its working was, therefore, been disappointing. The capacity of the plant was 750 tonnes cane per day, but owing regard to the size of the milling plant, it was capable of crushing about 1000 tonnes and could deal with a crop of 30 lakh mounds or 11,20 lakh qts. in a season.

The factory was handicapped by the ill health amongst the workers at the factory was located on the edge of the forest area, where conditions were extremely unhealthy. In addition, cane supplies were short on account of unsuitable nature of the forest land.

In 1949, therefore, a view was taken to shift the factory to Sheikhupura, which was situated 20 miles south of Lucknow. It, however, transpired that cane supply at Sheikhupura about 14 lakh mounds...
or 5.23 lakh qts., which could be increased to 25 lakh qts. or 5.33 lakh qts., by effecting development in the area. If shifted to Bojpur, the factory would have been 29 miles from Anguri, 12 miles from Bareilly and 24 miles from Allahabad. The sugar factories at these places were already short of cane supplies in their zones and cane from Bojpur was finding its way to these factories. The proposal to shift this factory to Bojpur, was, therefore, dropped as it was apprehended that the location of the factory at that place would jeopardise the existing cane arrangements between the other three factories. The factory was later shifted to Sultanpur in the Eastern Uttar Pradesh. It is still working in Sultanpur, as the cane supplies are found to be more regular there.

The following few graphs represent the case of individual sugar factories which were located without foreseeing the uneconomic disadvantages, that the sugar factories would have to face in not getting the full share of the cane required by them. But the Eastern districts of Uttar Pradesh, as a whole, where sugar factories had been up like mushrooms under the great of protection, presented unusual conditions of the sugar mills as a whole.

There were 31 sugar factories in the Eastern districts of the State that is, in the districts of Gorakhpur, Bareilly, lucknow and Sonbhadra. The fact not riveting condition prevailing in this tract on the eve of the First Five Year Plan have been noteworthy, as all the factories situated here had a common feature of lower crush, which during the three years proceeding the start of the plan, had been very poor. This is supported by the average duration of crushing season achieved by these factories during this period.
Appendix II indicates the daily cane crushing capacity of the sugar mills and the total quantity of cane actually crushed by them during the seasons 1947-48, 1948-49 and 1949-50. The factories had a total cane crushing capacity of 25,000 tonnes or say 6,95,500 munda a day. The factories were capable of crushing 9,59,53,662 munda for a season of 120 days. These factories in fact crushed 4,72,00,000, 4,63,81,000 and 4,56,66,000 munda cane only, during the seasons 1947-48, 1948-49 and 1949-50 respectively, or say an average of 4,56,59,000 munda against an annual total crushing capacity of 9,59,53,662 munda. This represented about 45 per cent of the total capacity or 55 per cent of the capacity remained idle or unutilised. The shortage of cane was also due to the fact that the average cane yields in Uttar Pradesh especially in western part of the state, were very low as compared to the rest of India. In 1948-49, Uttar Pradesh had an average yield of 117.7 tonnes. cane per acre whereas 300 to 400, 650 kilograms and 1000 kilograms had a yield of 30 tonnes, 65 to 80 tonnes and 100 tonnes per acre respectively. By 1950-51, the average yield of cane per acre achieved in the developed zones in Uttar Pradesh was 15.92 tonnes per acre, as compared to 35.30 tonnes in the bay, 20.47 tonnes in the western and 24.44 tonnes per acre in the east. In addition, cane planted in Uttar Pradesh was of poor quality as the growers possessed very small holdings in particular in the eastern Uttar Pradesh, and the cane cultivators did not find it economical to affect improvements in the style of land held by them. The poor quality canes gave low sugar recovery in the mills. In 1947-48, the average sugar recovery in the mills in Uttar Pradesh

was 3.5 per cent and it came down to 0.63 per cent in 1960. The percentage of recovery is even low today. The short supplies of cane accompanied by its poor quality, specially in the eastern districts of the state, did not allow the sugar factories to crush cane to their full capacities and for a normal length of the season, and these factors all combined, restrained the economic functioning of the sugar factories in the state.

The Government of Uttar Pradesh was alive to this situation and they appointed a committee known as SUGAR COMMITTEE, to look into the question of the possibility of shifting some of the sugar factories from the eastern districts of the state to places most suited for cane. It was found during the enquiry that nearly all the sugar factories in these districts were not getting their cane requirements even for 100 day's run. 'Jhunya sugar factory' had a crushing capacity of 65 lakh tons (31.75 lakh cts.) per season, but it was getting about 40 lakh tons (14.33 lakh cts.) cane in the season only. Similarly, sugar factories at Deoria, Sidhi, Namki, Banda, Janakpur, etc. were not getting cane supplies even for a period of 90 days. Most of the factories offered themselves to shift to other areas where they could be assured of better cane supplies, probably due to their attachment to the tract or due to the fact that with the supplies obtained by them, the factories were not facing financial losses which would compel them to reconsider the subject. The Indian Sugar Stand, 1939, had recommended a normal working season of 120 days for the fixation of the sugar prices, and it meant that longer was the crushing season, lesser were the manufacturing charges on cane.

(10) Indian Sugar, May, 1964, page 73
Since the sugar prices were fixed on the basis of the average achieved by the sugar factories in Uttar Pradesh as a whole, the factories situated in the eastern districts of the state felt handicapped in this matter, as these mills did not get as much profit as would have accrued to them, if cane had been crushed by them for a longer period in accordance with their normal capacities. In seasonal production, the length of the season is of extreme importance for processing the raw material. In fact quantitative and qualitative loss of raw materials, and consequently the final output, depends on the length of the season.

Another economic factor which cannot be ignored in the development of the industry is the size of the plant. The two essential pre-requisites for the establishment and successful working of a sugar factory are, a suitable site and an adequate supply of sugarcane. At the same time, factories required a well balanced and properly designed plant of an economic size, besides efficient technical personnel and good management. Variations in sizes are closely associated with variations in costs. As sizes increase, the costs show a progressive tendency to decline. Indeed the costs are the highest for the lowest sized group, and lowest for the highest sized groups. The medium size groups sometimes however, show wide variations in costs structures of individual units. Accordingly, some factories like Prayag and Kanspur seem to be working exceptionally well, while other factories like Sahu or Bihaspur do not seem to steer well. This brings us to the conclusion that not only the economic location but the size of the unit is also an essential adjunct of industrial efficiency.

It is a problem which is closely connected with that of the size, and which is an important factor these days. While thinking of 'minimization of costs', we have not only to think of the 'optimum location', but also of 'optimum size' of the industrial units.

Keeping the above considerations in mind, the Government of India enacted the Industries (Development) and Regulations Act, 1951. Under this Act, the existing undertaking were required to get themselves registered with the Central Government. Under this Act, the existing sugar factories could not expand their plans or shift themselves to new sites, except with the approval of the Central Government. No new sugar factory could be established without first taking the approval of the Central Government. These restrictions were placed on the Industry, so that the Nation's available resources could be exploited to their best economic advantage.

Thus in the First Five Year Plan, production target for the white sugar was fixed initially at 15 lakh tonnes (15,24 Mt. tonnes), and as the capacity of the Industry on the basis of the working season of 120 days was estimated at 15.4 lakh tons, no expansion of the Industry was recommended by the Central Planning Commission. This target was revised to 18 lakh tonnes (18,29 Mt. tonnes), for which it was proposed to raise the capacity of the sugar mills to 20 lakh tonnes (20,32 Mt. tonnes). This increase was achieved by the expansion of the existing units. A plant having a daily cane crushing capacity of 600 tonnes (812.30 Mt. tonnes) was considered to be the minimum economic unit. Therefore, the very first step undertaken was to bring the sugar factories having crushing capacities below this figure, to this level. By December, 1961, the Central Government issued licenses for the establishment
of 52 new factories and for the expansion of 45 existing units in India. This expansion covered an increase in the capacity by 5.1 lakh tonnes and raised the total capacity to 23.5 lakh tonnes (23,88,976 tonnes).

In 1950, there were 22 factories in Uttar Pradesh, each having a crushing capacity of less than 900 tonnes. In 1951-52, the total crushing capacity of the sugar mills in the state was 79,767 tonnes (71,999.27 net tonnes). In view of the fact that there were already enough sugar factories in the state, it was found economically beneficial to establish new factories outside the state, especially in southern India, where sugar had to be transported from north to feed the population. This measure was expected to reduce the transportation costs and movement difficulties. Accordingly, the Uttar Pradesh state was allotted only one new sugar factory in that expansion, but in addition the factories were allowed to expand their plants as follows:

**Table No. II-2**

Statement showing the expansion allowed to sugar factories in Uttar Pradesh.

<table>
<thead>
<tr>
<th>Name of the factory</th>
<th>Capacity after extension (net tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. F/s. Jodhpur Sugar Mills Ltd., Jodhpur</td>
<td>1050</td>
</tr>
<tr>
<td>2. Sir Chandlal Sugar and General Mill Ltd., Mani pur</td>
<td>1000</td>
</tr>
<tr>
<td>3. H.I. Sugar Ltd., Bareilly</td>
<td>1050</td>
</tr>
<tr>
<td>5. J.B. Lakshmibai Desai and Sons Jorwal Road</td>
<td>1100</td>
</tr>
<tr>
<td>6. Lord Krishna Sugar Mills, Saharanpur</td>
<td>1400</td>
</tr>
<tr>
<td>7. Diwan Sugar Mills, Sardhadi-Ponda</td>
<td>1100</td>
</tr>
<tr>
<td>8. Kundan Sugar Mills, Amroha</td>
<td>2250</td>
</tr>
<tr>
<td>9. Shyam Sugar Mills Ltd., Shyam</td>
<td>20.0</td>
</tr>
<tr>
<td>10. Jai Bhaoli Sugar Mills, Sangaoli</td>
<td>23.0</td>
</tr>
<tr>
<td>11. Such Sugar Mills Ltd., Harosaon</td>
<td>26.00</td>
</tr>
<tr>
<td>12. Khilatot Rotilal Sugar Mills Rotinagar</td>
<td>1300</td>
</tr>
<tr>
<td>13. Achchha Sugar Mills, Raja-Ka-Sanganpur</td>
<td>1500</td>
</tr>
<tr>
<td>14. Upper Gangas Sugar Mills, Sodhar</td>
<td>32.00</td>
</tr>
<tr>
<td>15. Upper India Sugar Mills Ltd., Khatauli</td>
<td>700</td>
</tr>
<tr>
<td>16. Gangas Sugar Company Ltd., Badaun</td>
<td>1600</td>
</tr>
<tr>
<td>17. Govt. Sugar Mills, Sodhumanpur</td>
<td>11.40</td>
</tr>
<tr>
<td>18. Behula Sugar Mills, Bura</td>
<td>25.00</td>
</tr>
<tr>
<td>19. Beris Sugar Mills Ltd., Bira</td>
<td>12.00</td>
</tr>
<tr>
<td>20. Upper Ras Sugar Mills Ltd., Strait</td>
<td>33.00</td>
</tr>
</tbody>
</table>

*Note: State.*
21. Auritsar Sugar Mills Co., Obana, Kalan 1350
22. R.B. Gauri Singh Sugar Mills, Baksar 1500
23. The Hindustan Sugar Mills, Gola 3600
24. Laksanji Sugar Mills Co., Ltd., Akoli 1800
25. Laksanji Sugar and Oil Mills Ltd., Hardoi 1800

(Sources: Collection from Sugar Annals of different years.)

With this expansion and the installation of new units, the cane crushing capacity of the sugar mills was expected to reach 1,05,372 tonnes a day in Uttar Pradesh and this represented more than 50 per cent of the total Indian capacity.

The Development Council for Sugar, which was given the task of recommending the sugar targets for the Second Five Year Plan, estimated that the requirements of white sugar would be about 24,78 lakh tonnes at the end of the plan. The Council, therefore, recommended for a total sugar production of 2.5 lakh tonnes and for raising the capacity to 25 lakh tonnes per annum. To achieve this target, additional capacity was released. By the middle of 1957, 57 licences were issued for the establishment of new factories for a total capacity of 6.28 lakh tonnes of sugar per annum or 55,400 tonnes of cane crushing per day. Out of these, 40 new sugar factories were recommended to be established in Southern India, representing 66 per cent of the new capacity licenced. Uttar Pradesh got a share of 6 new sugar mills only.

In addition, a factory with 1200 tonnes cane crushing capacity was licenced to be established at Pondicherry. Licences were also issued for the expansion of 69 sugar factories in the Indian Union representing a total crushing capacity of 95,583 tonnes of cane per day or about 3.8 lakh tonnes of sugar per annum. A major portion of this expansion was granted to the factories situated in Northern India, out of the 69 sugar factories which were granted licences.
for expansion, 34 were situated in Uttar Pradesh. It will thus be seen that the total increase sanctioned to bridge the gap in the capacity of the Industry in 1951 and that estimated by the end of the Second Five Year Plan, was about 10 lakh tonnes of sugar per annum and about one fifth of the additional capacity in the form of new establishments or by the expansion of the existing sugar mills was granted to Uttar Pradesh.

Very little change took place in the physical capacity of the industry during the first plan. In 1951, there were 158 sugar factories with a rated capacity of 15.4 lakh tonnes of sugar per annum in India. In April, 1956, 147 sugar factories with an annual capacity of 16.9 lakh tonnes sugar got themselves registered under the Development Act. Also there were 13 factories with a capacity of 51,000 tonnes sugar per annum which were lying idle.

During the first four years of the plan, installation of 26 new factories (including 21 co-operative sugar factories) and the substantial expansion of 26 existing factories was completed. During this period, 3 idle factories that of Bhatni (Uttar Pradesh), Rajan (Bihar) and Vijayalakshmi (Andhra Pradesh), also got registered themselves under the Act, 1951. The plant at Hadra (Anjou) was dismantled and shifted to Gujarat State. The small plant of 75 tonnes capacity per day at Koppaka (Andhra Pradesh) was shifted to Raichur-Dharwad district. There were thus 176 sugar factories registered under the Industries Act, by 1960, of which 163 actually worked in that year. By 1961, the actual installed capacity of 182 factories was 24.52 lakh tonnes sugar per annum and in that year, factories had manufactured 24.27 lakh tonnes sugar. The installed capacity of the sugar factories in Uttar
Pradesh rose to 9.25 lakh tonnes sugar per annum against an overall Indian capacity of 22.52 lakh tonnes sugar.

The Development Council for sugar industry recommended a consumption target of 30 lakh tonnes of sugar by the end of the IIIrd Five Year Plan period at a per capita consumption of 13.87 lb. of sugar in 1965-66 against 11.70 lb. in 1960-61. With a cushion of 2.5 lakh tonnes sugar, the capacity to be built by the end of the plan was estimated at 32.5 lakh tonnes. The working group of the sugar industry in Uttar Pradesh recommended for the establishment of 6 more sugar factories at Varanasi, Lucknow, Azamgarh, Fulpur, Barabanki, Allahabad, Rohilkhand, Meerut, Bulandshahr, etc. They also recommended the expansion of the existing 30 sugar factories to achieve the total additional crushing capacity of 16,000 tonnes a day. The State Government accepted the recommendations of the Industry and moved the Central Government for the grant of licenses for the new factories. While moving the Central Government, the State Government mentioned that licenses should be granted only to the co-operative sugar factories at these places.

In the Third Five Year Plan, the Planning Commission first accepted the target production of 30 lakh tonnes sugar and did not make any provision for increased capacity to serve as a cushion on the grounds, that enough cushion had been provided in the comparatively low number of crushing days adopted for calculating the capacity. The Planning Commission later revised this figure to 35 lakh tonnes on an ar, assuming thereby that an additional capacity of 12.5 lakh tonnes sugar was to be provided.

(19). Indian Sugar - August, 1960 - page 323
DIAGRAM No I

PRODUCTION OF SUGAR.

THOUSAND TONNES

in the plan period over and above the targets fixed in the Second
Five Year Plan. The additional capacity was to be distributed
as 60 per cent to the new factories and 40 per cent for effecting
substantial expansion to the existing units. It was calculated that
it would be possible to grant licenses to 55 new factories and to
effect expansion to 80 existing factories within this additional
capacity.

By 1962, only about 4.5 lakh tonnes capacity had been
approved in the shape of 19 new factories and substantial expansion
to 49 existing factories. By this time, the total number of
new units sanctioned for the second and the third plans was 71
and out of this number, 41 units had started crushing. Uttar Pradesh
had been allotted 6 new factories, but only 2 sugar mills had
started production of sugar by that time. In 1964-65, the total
production of sugar was 32.5 lakh tonnes. This was achieved with a
production capacity of about 30 lakh tonnes and there were 195
sugar factories producing sugar in that year in the Indian Union.
Diagram No. I shows the production of sugar in Uttar Pradesh and
the rest of India, for a brief comparison.

The Planning Commission fixed a production target of 45
lakh tonnes sugar by 1970-71. During the first, second and the
Third Plans, a capacity of 33.79 lakh tonnes sugar had been
licensed by the Central Government. An additional capacity of
9.8 lakh tonnes sugar had been licensed by the beginning of 1967
by way of 20 new units ( including 13 co-operative factories )
and by effecting expansion to 89 existing joint stock and co-
operative sugar factories. The additional capacity realised had
brought the total licensed capacity to 43.6 lakh tonnes sugar.

pages 103-115.
With regard to the size of the plant, the Development Council declared that sugar mills with 2000 tonnes daily cane crushing capacity would be considered economic units and desired the factories to raise their capacities to this level. The existing licensed crushing capacity of the factories in Uttar Pradesh is 1,20 lakh tonnes and additional 46,000 tonnes capacity is to be set up to achieve the target. The state has a large number of units having daily cane crushing capacity 1250/1500 tonnes and these units would be expanded to achieve the target. The *Uttar Pradesh High Power Sugar Industry Advisory Committee*, 1962, had recommended setting of a rotating capital of Rs. 5 crores for effecting expansion to this industry.

72 sugar factories are working in Uttar Pradesh against an all India total of 203 sugar factories as shown in Appendix III.

The preceding paragraphs deal with the expansion of the sugar industry during the periods of the Five Year Plans. At the same time, the cane crushing capacity of the mills has increased in somewhat similar proportions to the increase in the area under cane cultivation and its yield in different States. The following table gives frequency distribution of cane crushing capacity in sugar mills in Uttar Pradesh and the rest of the Indian Union, as a whole. The most important factors which explain and account for the regional differences in sizes are the availability of cane in required quantities within a reasonable economic distance and the percentage of sucrose in the cane.

Other factors like the density of cane cultivation, the economic intensity of competition from alternative commercial crops, the capacity to lengthen the crushing period, have also their say in

this matter. It also shows that in Uttar Pradesh, as in India, the units having a cane crushing capacity of less than 700 tonnes per day are gradually disappearing as such units have been considered to be uneconomical in the present circumstances.

Table No. II 3
Frequency distribution of cane crushing capacity in sugar mills in Uttar Pradesh and the rest of the Indian Union

<table>
<thead>
<tr>
<th>Cane crushing capacity in tonnes</th>
<th>Uttar Pradesh</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>100-200</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>200-300</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>300-400</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>400-500</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>500-600</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>600-700</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>700-800</td>
<td>16</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>800-900</td>
<td>2</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>900-1000</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>1000-1250</td>
<td>14</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>1250-1500</td>
<td>10</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>1500-1750</td>
<td>7</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>1750-2000</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>2000 and over</td>
<td>1</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>73</td>
<td>138</td>
</tr>
</tbody>
</table>


(*) Figures supplied by the Indian Sugar Mills' Association

The Indian Sugar Industry achieved nearly its target and was even able to export surplus sugar to other countries. In 1966-67, it exported 59,000 tonnes sugar earning Rs 2.6 crores of foreign exchange. This figure increased to 3,73,000 t. tonnes during 1962-63 earning Rs 14.32 crores of foreign exchange. In 1963-64, 1964-65 and 1965-66, sugar exported was 4,78,572, 2,34,293 and 2,76,518 t. tonnes, respectively.

An outstanding feature of the expansion programme of the sugar industry is the establishment of a large number of factories.

by sugarcane growers on a co-operative basis. The object of giving
incentive of co-operation was to enable the sugarcane growers with
small or moderate means and resources to combine themselves to
collect the benefits of large scale operations by grouping their
single efforts.

The 'co-operative Society' now existing in India to-day for
the manufacture of white sugar is in fact not new to this country.
From times immemorial, interdependence or co-operation has been the
basis of the 'Hindu Family' and village organizations. Under the
system existing in those days, cane cultivators frequently moved one or
two cane mills together which they took turns in driving with their
bullocks. The ancient Indian Scripture 'KALYAN CANDAS AKAN' provides,
"Whoever stays away from any kind of co-operative undertakings shall send his servants and bullocks to carry on the work,
shall have a share in the expenditure but none in the profits."
Ancient India had crafts guilds with banking a feature of their
activity. They are referred to in the Vedas, as well as in the
'Law of Man'.

Efforts were made earlier also to establish co-operative
sugar factories soon after the grant of protection to the industry
in 1932. A sugar factory was set up at Biswan in Uttar Pradesh
in 1933-34 with a crushing capacity of 150 tonnes, but it did not
work profitably and was disposed of to a private industrialist.
In 1955-56, there were 3 co-operative sugar factories in the Indian
Union which produced only 1.4 per cent of the total sugar production
of India. In 1960-61, the number of these factories rose to 30 and
by the end of 1965, there were 50 sugar factories in operation and
they produced 7.36 lakh m. tonnes of sugar, representing 24 per cent
of the total Indian production of 30 lakh m. tons. The credit for

(23) Foundation of Indian colonies, 1916 - London, Page 117
achieving the highest recovery in sugar also goes to a co-operative sugar factory in Maharashtra, which recovered 13.37 per cent sugar out of sugarcane.

In March, 1964, the factories had 2 lakh members, out of which 90 per cent were cane growers. The share capital of these factories had increased to 22.64 crores, of which the State Government had contributed 9.10 crores and loans advanced by the Industrial Finance Corporation for Block Capital of sugar factories was 36.83 crores. Satisfied with the outstanding achievements of these sugar mills, the Central Government took a decision to give further licenses for the new mills to the co-operative sugar factories only. During the Second Plan, licenses were given to 39 co-operative societies for the construction of sugar factories and similarly during the Third Plan, licenses were granted to another 22 co-operative societies, for setting up of new sugar factories. By August, 1966, there were 74 co-operative sugar factories functioning in the Indian Union and the draft Fourth Plan anticipated issuing of licenses to another 32 co-operative factories by 1970-71.

In brief, the sugar industry in Uttar Pradesh as well as in India grew under a protective umbrella, but the growth has been greatly influenced by Government price policies and excise taxes on sugar, which, in turn, have reflected the varying and frequently conflicting interests of cane growers, sugar producers, and the consumers. The existence of a somewhat competitive cottage industry and changing consumer preferences for cottage and factory sugar in relation to per capita incomes, are the parameters within which the policy operates. In any one year, sugar output has frequently been a direct result of short-run government price and tax policies to

(25) Theory, History and Practice of Co-operation, 1966 - Raghubans
New Delhi, New Delhi - page 319
(26) Indian Sugar - August, 1966 - page 379
to raise or lower cane and sugar prices. But the long run effects of these changing policies, the higher purity of factory sugar, and the lower percentage of waste in factory sugar production has been to encourage factory sugar output. The growth of the factory sugar industry has received substantial support from its harmony with the interests of cane growers.

Apart from government policy, a major influence in the annual level of output of factory sugar has been the relationship between the cane and gur prices. The farmer has the choice of either selling his cane to factory at the government set minimum prices or turning it into gur in villages. It is clear that if the gur prices rise relative to cane prices, the farmer may prefer to process his cane himself and sell it as gur. In turn, on the consumption side, the relationship between the prices of sugar and gur influences the consumption of each, especially in the rural areas.

DEcline OF SUGAR INDUSTRY IN UTTAR PRADESH:

The sugar industry in Uttar Pradesh is on the decline and is losing ground to other States. It was in Uttar Pradesh and Bihar that sugar industry developed at the time of the grant of protection in 1931 and at that time no less than 90 percent of the sugar produced in India came from these two States. They maintained the lead till 1952, when they accounted for only 75 per cent of the total Indian production of sugar. In 1953-54, this figure fell to 71 per cent and the share of Uttar Pradesh was 56 per cent in it.

In 1957-58, the share of Uttar Pradesh fell to 47.7 per cent and in 1958-59 to 44.3 per cent. In 1963-64, its share fell down to 43 per cent.

Of the two wings, the East and the West Uttar Pradesh - the
Factories in Uttar Pradesh had 42 sugar factories which declined to 32 in 1959-60. When all the new factories sanctioned in the plans start sugar production in full swing, the factories in this region will find it difficult to market their sugar. For the last many years, the factories in this region have worked for about 100 days against the working season of 136 days in Western Uttar Pradesh. At the same time, the average daily crushing capacity of these factories by sixties was 837 tonnes, as compared to 1553 tonnes in Uttar Pradesh, 1195 tonnes in Punjaban, 986 tonnes in North Bihar, 955 tonnes in Bombay and 930 tonnes in Madras. Presently, the sugar mills in the Eastern Uttar Pradesh have also not been able to have their pre-expansion crush and all the expansion undertaken has remained unutilised. It has been due to the large scale diversion of cane for the manufacture of gur and khandsari in this tract and also due to the fact that the average sugarcane yield in Western Uttar Pradesh, which was 14.50 tonnes per acre in 1959-60, went down to 13.70 tonnes in 1964-65, resulting in the production of cane in lesser quantities. This decline was coupled with the loss of sugar recovery in the factories which went down from 9.47 per cent in 1960-61 to 9.04 per cent in 1964-65.

Further, the sugar industry has a 'material index' of greater than unity, and hence the industry is not capable of considerable dispersal. The importance of the raw material can be judged from the fact that in the cost of production of white sugar, the price of sugarcane represents from half to two thirds of the total costs. If we secure economy in the cane costs it will greatly influence the competitive position of the industry. The sugar

industry can, therefore, be described as 'raw material localised', whose location is entirely governed by the availability of sugarcane in sufficient quantities and that too within a reasonable economic distance. The industry is predominantly localised in Uttar Pradesh and Bihar and it may not be economical to disperse the industry from these states.

Other States, like West Bengal, Punjab, Andhra Pradesh have succeeded in attracting the industry in recent years, as a result of the extension of sugarcane cultivation in these areas, consequent upon the development of irrigation and transport facilities. The recovery percentage is higher in Maharashtra and Madras States as compared to that in Uttar Pradesh, but the cost of sugarcane cultivation is higher in the former States due to higher cost of irrigation and heavy mechanising of the crop. Uttar Pradesh has got the alluvial soils of the Indo Gangetic Plain, and its dependence on artificial nature is less as compared to the southern States.

When the question of the uneconomic functioning of the factories in Eastern Uttar Pradesh and the possibility of their shifting from this region, was referred to the High Power Sugar Advisory Committee of Uttar Pradesh in September, 1962, they suggested to the State Government that the problem with this industry was only the low cane yield. The Committee had, therefore, recommended the extension of development schemes to the factories. The scheme comprises intensive development of at least 4000 acres of land around each factory so that the mills could get sufficient and good quantity cane at the rate of within a reasonable distance from the factories.

(28). The Economics of Location, 1959. William R. Logan. page 185
The S undu Rao Committee, 1963, appointed by the Central Government to look into the affairs of the industry in this State, also strongly recommended rehabilitation, modernization and the expansion of the sugar factories here. Even the Patel Committee for eastern Uttar Pradesh, and the Sugar Enquiry Commission’s observations about the suitability of the State for sugarcane cultivation, lend strong support to the allocation of additional capacity to the State.

What the State is required to do is to adopt ways and means to raise the yield and quality of the cane and also check its dispersal leading to the manufacture of jaggery and khandsari in the State, so that enough cane becomes available for the white sugar industry.

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