CHAPTER V

INDUSTRIES

Old-time Industries

BEFORE the advent of the modern industrial era, some small-scale industries flourished in certain places in the district, cotton cloth, blankets, brass utensils, earthen-ware and jaggery being some of the principal industrial products. It is interesting to note that Ganjam in Srirangapatna, at one time, was an industrial centre and was known for the manufacture of the best variety of cloth. This place was established by Tipu Sultan, who, in order to provide it with an industrial population, is said to have brought to this place twelve thousand families from Sira in Tumkur district which had been a seat of the Nawabs[1]. It is also said that even paper was being manufactured in Ganjam. The presence of soda and lime nearby for bleaching purposes might have influenced its localisation[2]. The district was also known for the manufacture of wires for musical instruments. It is said that superfine indigenous steel was utilised for making these wires.[3] The special character of the wires was due to the peculiar tempering and the high quality of steel used. The industry languished owing to decrease in demand for the wires and the difficulty in getting the proper kind of good steel; the local industry of making steel from the Mysore-made superior wrought iron practically died out and the skill was practically lost.[4]

Another old-time industry was the sugar factory at Palahalli near Srirangapatna, which was called the Ashtagram Sugar Works. This sugar mill was established in the year 1847.[5] The then Chief Commissioner of Mysore, Sir Mark Cubbon, gave his support to this enterprise and it has been recorded that this factory proved a source of great public benefit by developing the

1. C. Hayavadana Rao, Mysore Gazetteer, Vol. V, 1930, p. 658.
2. Dr. R. Balakrishna, Industrial Development of Mysore, 1940, p. 30.
3. Ibid, p. 30.
4. C. Hayavadana Rao, Mysore Gazetteer, Vol. III, 1921, p. 251
5. Mysore District Gazetteer, 1869, p. 94.

resources of agriculture in this area. The affluent positon of the cultivators in this region in comparison with those of the neighbouring taluks was fully utilised.[1] The jaggery produced by them from the sugarcane and date-palm was brought to this Palahalli factory and refined into sugar on a large-scale. The prize and medal for the best crystallised sugar at the great exhibitions in London in 1851 and 1861 were awarded to the Ashtagram Sugar Works. At the universal exhibition of Paris in 1867, where the exhibits were numerous and competition great, " honourable mention " was also awarded to this sugar works.[2] This factory was closed down in 1894. It is also gathered from records that at Palahalli, there was a distillery where the spirits required for consumption in the then Mysore district (which included the present Mandya district) were manufactured by individuals who possessed licences for the purpose.[3]

Metal Industry

Brass-casting and steel metal work were carried on at Nagamangala. Lamp stands, images of gods and elegant utensils were made in this place. A large local demand for these products helped to stabilise these industries. It has been observed that this industry was in a languishing condition in 1914.[4] The flooding of the country with cheaper substitutes such as aluminium and enamelled wares was responsible for the waning of these artistic metal industries.[5] The inlaying of ebony and rose-wood with ivory is a craft which claimed a hoary antiquity in Mysore. The gates of the Mausoleum of Tipu at Srirangapatna are proud specimens of this extraordinary skill of Mysore craftsmen.[6]

Another important old-time industry was the manufacture of silk cloths in some places in the district. Silk weaving was carried on in the old days at Ganjam[7] and at Sindaghatta[8] in Krishnarajpet taluk. Silkworms were largely reared at Mandya, the cocoons being sent to Channapatna for reeling. The raw silk brought from the neighbouring taluks was spun into thread, dyed and woven at Sindaghatta.[9] Besides, Mandya was also famous for the manufacture of a superior kind of *kambli* (blanket).[10] As regards hadloom-weaving, Melkote is

1. 2. Mysore District Gazetteer, 1869, p. 94.
3. Ibid, p. 92.
4. V. S. Sambasiva Iyer, The Resources, Industries, Trade and Commerce of Mysore State, 1914, p. 58.
5. Industrial Development of Mysore by Dr. R. Balakrishna, 1940, pp. 29–30.
6. Ibid, p. 48.
7. Mysore District Gazetteer, 1869, p. 47.
8. C. Hayavadana Rao, Mysore Gazetteer, Vol. V, p. 705. Also Provincial Gazetteers of India-Mysore State, 1908, p. 188.
9. C. Hayavadana Rao, Mysore Gazetteer, Vol. V, p. 705.
10. Provincial Gazetteers of India-Mysore State, 1908, p. 189.

well-known even to this day for a special variety of dhoties called the Melkote dhoti.

Power development

Mysore, as is well known, has been a pioneer in the development of hydro-electric power. The first generating station at Shivasamudram was established as long back as 1902, in order to meet the power demands of the Kolar Gold Mining Company. This was the first attempt to tap hydro-electric potential in India. The Cauvery Power Scheme was initiated in 1900 under the guidance of Sir K. Sheshadri Iyer.

In 1894, Mr. Edmund Carrington, an Electrical Engineer, applied for concessions to tap the water-power at the falls. He was connected with Mr. Holmes of Madras, one of the pioneers of electricity generation in India. These gentlemen and Colonel Henderson, the then British Resident in Mysore, who took a keen interest in the scheme, recognised that long distance transmission of power might be possible.

The Mysore Government considered it advisable to investigate the practicability of generating power at the Shivasamudram Falls site and obtained, from the Madras Government, the services of the Chief Engineer at Madras, for the purpose. In his report he took a very favourable view of the potentialities of the head at the Falls. In June 1899, the Deputy Chief Engineer of Mysore, after studying the details of the power installation at the Niagara Falls, conceived the idea of working the machinery at the Kolar Gold Mines with electricity generated by the Cauvery Falls, and this scheme received the hearty support of Sir K. Sheshadri Iyer, the then Dewan of Mysore, and Colonel Campbell, the Chief Engineer. Messrs. John Taylor and Sons of London, who had the general control of the mines in the Kolar Gold Fields, also supported the scheme. The Government decided in 1899 to utilise the head near the Falls for the production of electric power and its transmission for the service of industrial undertakings in different parts of the State, including the Kolar Gold Mines.

In embarking upon this great undertaking, the Government were influenced by the consideration that the supply of a cheap motive power of the kind and on the scale proposed, was likely to foster industrial enterprises throughout the State and thus indirectly increase the wealth and general prosperity of the country. The Deputy Chief Engineer was deputed to Europe and America to examine the project in consultation with the experts there. The Mysore Government acquired from the Government of Madras the right to utilise the whole of the water-power at the head of the Falls under certain conditions. The sanction of the Government of India for the various details, such as the concession from the Government of Madras, the

agreement with Messrs. John Taylor and Sons and the individual miners, a contract with the General Electric Company of Schenectady, United States, and Messrs. Escher Wyss & Co., Zurich, was received in March 1900. In June 1900, the agreement with Messrs. John Taylor and Sons was signed. Arrangements were made with the General Electric Company of New York for electrical plant and Messrs. Escher Wyss & Co., Zurich, for hydraulic plant, the former taking the entire responsibility for installing the plant and working at the spot for a period of one year. The works were completed by 1902, and on the 30th June of that year, the generated power (30,000 volts) was successfully transmitted for the first time to the Kolar Gold Fields.

Expansion schemes

The power developed by the first installation was 6,000 H.P., but owing to the increased demand for power at the Gold Fields and in Bangalore and Mysore cities for both power and lighting, the generating station was extended by the second installation in 1903, the third installation in 1907, the fourth installation in 1914-15, the fifth in 1918 and the sixth in 1919. The seventh installation was sanctioned in 1925. The total power generated was raised by the sixth installation to 34,000 H.P. The seventh installation provided for an extra 14,000 H.P., the total power thus generated under the seven installations being 48,000 H.P. The name of Sir K. Sheshadri Iyer will be remembered long as the person who laid the foundations for hydel power development in the State. The advent of electric power at the Cauvery Falls site in Mandya district revolutionised industrial activity in Mysore and made it possible to establish a large number of big and small industries in the State. The Shivasamudram station which was established in 1902 with an installed capacity of 4,500 kws increased gradually to 42,000 kws by 1938.

As the demand for power increased, the Government of Mysore took up the development of additional sources of power generation. The Shimsha power station with an installed capacity of 17,200 kws. was commissioned in 1940.

The power line to Mysore was drawn from the Shivasamudram generating station to a point very near Malavalli and from there, it passed, in close proximity to Bannur and Alahalli, on to the Sri Narasimharaja Power Station at Mysore. The distance is roughly 33 miles. The other two lines to Kolar Gold Fields and Bangalore ran parallel to each other from the generating station up to Kanakapura where they deviated, one to Bangalore running *via* Herehalli, Vasanthapura and Nayandahalli, and the other to Kolar Gold Fields passing through Kanakapura, Jigani and Chandapur. The Shimsha line was linked to these lines at a place close to the generating station.

Power potential in Cauvery basin

In addition to the hydel power generated at Shivasamudram and Shimshapura with the installed capacities of 42,000 and 17,200 kilowatts respectively, several other schemes were thought of to get the maximum out of the Cauvery river basin. At one time, there was a suggestion to close down the Shivasamudram generating unit and divert the entire water of the existing power channels to Shimsha, in order to generate more power from the same quantity of water. This project required a total outlay of Rs. 348 lakhs.

The other proposal was to construct a dam across the Shimsha river and to run power channels to a new generating station at a place not far from the present Shimshapura station in order to get more power. The total cost of this project was estimated at Rs. 795 lakhs.

Yet another proposal was to generate 40,400 kilowatts of power at a site near the Mekedatu gorge in Kanakapura taluk of Bangalore district at a cost of Rs. 400 lakhs.

The Hogenkal project, a proposed combined venture of both Madras and Mysore States, has a vast potential for generating nearly a million kilowatts of power at a site further down the Mekedatu gorge. This scheme is to be finalised after both the State Governments come to an agreement. The project report has been prepared. The idea is gaining ground that the Hogenkal project, if it comes to fruition, will serve the needs of the southern power grid better than small, piecemeal units in the basin, which would be more expensive.

Power supply to Mandya district

For purposes of electric power supply, Mandya town has a receiving station while sub-stations are located at Basaral, Pandavapura, Melkote, Maddur, Malavalli, Srirangapatna and Nagamangala. Special attention has been paid to supply electric power to villages under the intensified rural electrification scheme. As on 31st March 1965, there were in all 100 electrified villages in the district. It is proposed to electrify another 200 villages during the Fourth Plan period.

Electricity at present is largely used for lift irrigation works. During 1964-65, power supply was made for 611 pump sets in all parts of the district. It has been the policy of the State Government to extend power supply for agricultural purposes also in order to step up food production. In accordance with this policy, it is proposed to supply power to 900 irrigation pump sets during the Fourth Plan period.

A programme for intensified agricultural production is in operation in the district. In connection with this, installation

of 82 pump sets aggregating to 381.5 H.P. at a cost of Rs. 1,72,606 has been approved for execution in Mandya division.

Two new step-down stations of 66 KV at a total cost of Rs. 30 lakhs are being set up in Mandya division. A programme of conversion from 25 to 50 cycles was completed during 1963-64. There were two R.C.C. pole-manufacturing units in the Mandya district to supply poles for power distribution lines.

As on 31st March 1965, the total number of lighting connections in the district was 9,286 together with 42 heating circuits. To facilitate uninterrupted and reliable supply of power to consumers, power from the Cauvery, Jog, Sharavathi, Bhadra and Tungabhadra have been paralleled at the new receiving station at Bangalore, forming the Mysore grid.

Large-scale Industries

Large-scale modern industrial activity in the district may be said to have begun when the Mysore Sugar Company started its factory at Mandya in 1933. Other places where large-scale industrial concerns are located are Pandavapura and Belagola. It may be said that while the district is agriculturally prosperous, it is also being well-developed industrially. In the following pages, an attempt has been made to deal with the existing industries as also the district's industrial potentialities, which may be exploited in the years to come.

Sugar Industry

The sugar industry which has a direct link with agriculture—a link for which there is no exact parallel in the case of other industries—is today one of the foremost major industries in the country and the progress it has made in recent years is significant. The Indian sugar industry owes its development to a certain extent, to the grant of protection by Government in 1932 and it was about this time that two factories within the confines of the present Mysore State came into existence, one at Mandya and the other at Hospet in Bellary district. Another factory on a co-operative basis started working at Pandavapura in 1956 and thus, there are now two sugar factories in Mandya district, which have a pride of place in the industrial map of the district.

The problems of size and location of sugar industrial units, of late, assumed great importance in the sphere of industrial organisation. The efficiency of the industry as a whole depends to a very large extent upon the suitable location of plants and upon their " most profitable " size, which is technically called as " optimum size ". The main economic factors, among others, influencing the choice of location are (*a*) availability of raw materials, (*b*) presence of skilled labour at an economic price, (*c*) transport facilities and (*d*) proximity to market.

The main raw material needed in the manufacture of sugar is sugarcane. The district of Mandya is one of the important sugarcane zones in the State. Before the construction of the Krishnarajasagar dam across the river Cauvery, the area comprising the present Mandya district was mostly an arid region with an average rainfall of about 27 inches annually. Side by side with the construction of the dam, an extensive soil survey was conducted round about the area in the year 1930-31 as a preliminary to the irrigation project under the Cauvery valley scheme. With the completion of the Krishnarajasagar reservoir and the formulation of the irrigation plan under the Irwin canal (now renamed as Visvesvaraya canal) in the year 1931, designed to irrigate approximately 1,20,000 acres of land, ample opportunities were created for large-scale cultivation of crops like sugarcane. The Krishnarajasagar dam is the direct outcome of the efforts of the "Maker of modern Mysore", Dr. M. Visvesvaraya, who had the foresight and initiative at a time when economic planning and industrialisation were still in their infancy in India. The sugar factory at Mandya is one of the biggest industrial units in the State.

From the point of view of transport facilities, both Mandya and Pandavapura are on the Mysore-Bangalore Railway line and are also served by good roads. There is no dearth of labour in this area and as the transport facilities are good, the manufactured sugar can reach distant markets easily.

The Mysore Sugar Company Ltd.

When Mandya district was brought under assured irrigation consequent on the construction of the Visvesvaraya canal, the Government of Mysore recognised that the prosperity of the region would depend in a large measure on the profitable cultivation of a commercial crop like sugarcane and that this would be possible only if manufacture of sugar on modern lines was initiated on a fairly large-scale. The sugar industry being in the nature of a new industrial venture and capital being shy in those days, the then Government of Mysore took the initiative to float a joint stock company, as an earnest of its interest in the welfare of the agriculturists on the one hand and to infuse confidence in the minds of the investing public on the other. Thus, the Mysore Sugar Company came into existence in January 1933 with an authorised capital of Rs. 20 lakhs, of which 60 per cent was taken by Government. This pattern of company formation with the Government holding a majority of shares was a novel one and may well be said to be the fore-runner of the present day public sector companies. If Dr. M. Visvesvaraya paved the way for the eventual establishment of the sugar industry, the credit for actually bringing the factory into existence should go to Sir Mirza M. Ismail, the then Dewan of Mysore, who was

largely instrumental in sponsoring the company by taking advantage of the favourable opportunity presented by the grant of protection to the sugar industry in 1932.

The Mandya Sugar Factory started production early in 1934 with a small plant, having a crushing capacity of 400 tons of sugarcane per day. The quantity of sugar production during the first year was only 5,250 tons. Encouraged by the initial success of the venture, the capacity of the factory was raised to 600 tons of cane per day in the very next year. The factory was further expanded so as to have a crushing capacity of 1,400 tons of cane per day, in response to the pressure from the agriculturists, who were capable of growing and supplying more and more sugarcane. As a result of further additions to the plant, the factory is now capable of crushing as much as 2,000 tonnes of cane per day. The production of sugar has correspondingly risen to 40,000 tonnes per annum. There are only a few factories in India having a comparable output of sugar.

The factory's requirements of sugarcane amounting to about 4,00,000 tonnes per annum are grown over an area of nearly 10,000 acres within a radius of 10 to 15 miles of the factory. The pressure on the factory for purchase of cane is so great that it is forced to restrict the quantity to be purchased from each grower, so as to give opportunities for as large a number of cultivators as possible. The result is that the factory purchases cane in small quantities from as many as about 12,000 agriculturists. The planting of cane is spread over in such a way as to secure for the factory about four lakh tonnes of ripe sugarcane every season, which generally begins in July and lasts upto the following February or March. The Mandya factory has the longest crushing season of nearly 250 to 300 days in a year, which is almost more than double the all-India average of about 130 days.

Supply of sugarcane

The system of growing sugarcane for supply to the factory at Mandya is rather unique and is based on modern democratic principles. The system, which is known as *oppige* in Kannada, consists of an undertaking on the part of each cultivator to plant and supply cane to the factory as per terms and conditions stipulated in an agreement to be executed by each one of them individually, while the company on its part, agrees to pay them for cane at the statutory minimum price fixed by the Government of India, and, in the meanwhile, to advance their requirements of seed materials and manure, such as, ammonium sulphate, oil-cake and supers needed for the purpose, besides paying them a cash advance of Rs. 8 per tonne of cane, to meet the harvesting and supply expenses. The total value of advances so made to the cultivators comes, on an average, to about Rs. 350 to Rs. 400 per acre under normal conditions, which will be fully recovered in their respective cane supply bills with a nominal interest of four per cent. As a

measure of controlling the heavy onrush of applications for planting cane under *oppige* system, the company fixes the maximum and the minimum area to be allotted for planting cane by each individual under the sluices of the different distributaries, after eliciting the consensus of opinion of the majority of the cultivators at their annual conference. Besides, the agriculturists are given free expert advice during the course of growing cane under *oppige* system and even the different stages of agricultural operations from start to finish are supervised by the company field staff, headed by a Cane Superintendent, so as to ensure a good crop. Besides, a laboratory has been maintained at Mandya under the charge of the Government Entomologist for purposes of controlling the pests and diseases of cane and the establishment charges thereon are being met by the company.

Sugarcane Farms

In addition to purchasing sugarcane from the cultivators, the company also maintains its own sugarcane farms, numbering 11, comprising an extent of nearly 2,600 acres. These farms also serve as demonstration plots where experiments are conducted in regard to the various aspects of sugarcane cultivation.

For a period of two decades from 1933, the history of the sugar industry in the State was that of the Mysore Sugar Company, Ltd., for there was no other sugar factory in the old Mysore State. During that period, the Mandya factory was meeting the entire requirements of sugar in the State and was also sending out large quantities to the neighbouring States. The table below gives particulars of the working of the factory from the crushing season of 1933-34 to 1964-65.

Year (Crushing Season)	Quantity of Sugarcane crushed (in tons)	Quantity of Sugar produced (in tons)	Average recovery of sucrose	No. of working days
1	2	3	4	5
1933-34 ..	51,784	5,250	9.89	121
1934-35 ..	83,897	8,072	9.54	203
1935-36 ..	2,23,925	23,348	10.30	271
1936-37 ..	2,21,571	21,799	9.80	255
1937-38 ..	2,61,120	26,335	9.82	251
1938-39 ..	2,31,230	23,252	10.05	204
1939-40 ..	3,05,371	30,601	10.02	268
1940-41 ..	3,12,923	27,804	8.89	263
1941-42 ..	3,32,710	27,455	8.28	284
1942-43 ..	1,63,212	15,666	9.59	232
1943-44 ..	2,04,587	20,211	9.88	255
1944-45 ..	1,80,696	17,322	9.59	232
1945-46 ..	1,61,312	17,505	10.66	182
1946-47 ..	1,57,786	16,058	10.17	191

1		2	3	4	5
1947–48	..	1,92,434	17,358	9.58	238
1948–49	..	3,18,305	27,321	8.57	341
1949–50	..	1,75,822	16,783	9.54	186
1950–51	..	24,719	2,015	9.18	68
1951–52	..	3,19,268	37,155	11.62	243
1952–53	..	2,45,500	27,962	11.37	196
1953–54	..	12,582	1,210	9.62	37
1954–55	..	3,75,548	35,312	9.49	292
1955–56	..	3,47,523	34,798	10.14	266
1956–57	..	2,24,228	21,631	9.71	175
1957–58	..	3,83,814	39,520	10.40	239
1958–59	..	3,48,814	35,906	10.24	217
1959–60	..	3,41,804	34,806	10.37	249
1960–61	..	3,95,963	39,049	10.52	267
1961–62	..	3,86,350	38,764	10.62	257
1962–63	..	2,57,363 (metric)	27,390 (metric)	10.52	202
1963–64	..	1,99,860 (metric)	22,091 (metric)	11.03	155
1964–65	..	3,70,375 (metric)	35,441 (metric)	9.60	278

Distillery branch

As a means of economic disposal of molasses, a distillery was installed in 1935 as an adjunct to the factory, with an initial capacity of 1,500 gallons of 96 per cent rectified spirit per day. This was the first modern distillery to be established in India. After conducting initial experiments in the use of alcohol for power purposes, a dehydration unit which was capable of converting the industrial alcohol into absolute alcohol, was established. In this case also, Mysore was the first State to instal such a plant. With a view to utilising fully all the alcohol so produced, a Power Alcohol Act, making the selling of a mixture of petrol and alcohol in certain proportions compulsory, was passed by the Mysore Legislature. Later, when the demand for alcohol increased during the Second World War and the import of plant and machinery from abroad was no longer possible, steps were taken to fabricate a plant in one of the workshops at Bangalore.

The Mandya distillery is at present producing industrial, potable and power alcohol. A major part of the requirements of industrial and potable alcohol of Mysore State are met by this distillery. The use of alcohol for power purposes has been confined only to transport needs, including its use as fuel for agricultural tractors of the Mysore Sugar Company since 1946. It is interesting to note that production of alcohol is the barometer of the progress of chemical industry of any country. The

power alcohol scheme was, however, discontinued from the year 1950.

Thus, Mandya has come to occupy a prominent place in the distillery industry also. The Mandya distillery is modern in design and has an installed capacity of 1,00,000 gallons of alcohol in terms of absolute alcohol per month or 12,00,000 gallons per annum.

The products manufactured in the distillery are :—

1. Absolute alcohol, *i.e.*, alcohol of 99.6 per cent purity used for scientific and industrial purposes and as motor fuel with an admixture of petrol for power purposes.

2. Rectified spirit, *i.e.*, alcohol of 96 per cent purity used for pharmaceutical, scientific and industrial purposes.

3. Denatured spirit, *i.e.*, rectified spirit mixed with certain prescribed denaturants so as to render it unfit for human consumption. This spirit is used largely for manufacture of polishes and for burning purposes.

4. Molasses arrack ; and

5. Special liquors, such as brandy, whisky, gin and rum.

Great demand

There is a great demand for the various kinds of spirits manufactured in the distillery at Mandya both from within and outside the State. There are possibilities of new uses of alcohol and the many development schemes under the Five-Year Plans are bound to increase the demands for alcohol for industrial purposes.

Another product manufactured out of sugar, which is becoming very popular, is a honey-like preparation called " golden syrup ". The company is expanding this line of manufacture and putting the product on the markets on an all-India scale. This superior quality of golden syrup is packed in attractive tins and there is good demand for this product from all over India.

Other ancillary industries that could be set up by utilising the by-products of the alcohol industry may also be mentioned here. The sugar in molasses is convertible into alcohol and carbon-dioxide in the ratio of roughly 50:50. The sugar industry being an agricultural industry, uses large quantities of nitrogenous fertilisers in the form of ammonium sulphate for raising cane. Annually, over 3,000 tonnes of ammonium sulphate are purchased by the Mysore Sugar Company alone for issue to the cultivators, who supply cane to the factory. The same nitrogen requirements

can be met by 1,500 tonnes of urea. By the interaction of carbon-dioxide with liquid ammonia which can be synthesised by utilising nitrogen from the atmosphere and hydrogen from water, urea can be manufactured economically.

Expansion schemes

The year 1965 was an eventful one for the company, heralding an era of further expansion. There is a proposal to increase the crushing capacity of the factory to 2,500 tonnes of sugarcane per day, for which the company has been given an industrial licence. The distillery plant is also being expanded so as to raise its installed capacity from 12 lakh gallons to 24 lakh gallons of alcohol per year. A new line of development that has been undertaken is the manufacture of acetic acid for which also the company has been given an industrial licence. The manufacture of this new product is part of a bigger scheme for the manufacture of cellulose acetate, for which a separate company has been sponsored by the Mysore Sugar Company. Yet another major scheme of expansion, for which also the necessary industrial licence has been issued, relates to the manufacture of caustic soda and chlorine. These schemes of expansion involve a capital outlay of nearly five crores of rupees.

The company provides employment to nearly 5,000 persons in its factory, farms and offices and its annual wage bill on account of direct wages and other benefits amounts to nearly Rs. 50 lakhs.

Pandavapura Sahakara Sakkare Karkhane

With the increasing importance of the co-operative movement and the development of agro-industries in the State's economy, coupled with the abundance of sugarcane grown round about Pandavapura, the possibility of establishing a sugar factory there on co-operative lines was examined. As a result of this, a society was registered on 10th January 1955 at Mandya to encourage proper development of agricultural industries on co-operative lines by introducing improved methods of agriculture and also to promote co-operative and joint farming. Another important aim of the society was to establish and manage a sugar factory. Accordingly, a licence under the Industries Act was secured by the society on 2nd April 1956 to start a sugar factory at Pandavapura with an installed crushing capacity of 800 tons of sugarcane per day.

This co-operative enterprise which was started in the year 1956, is managed by a Board of Directors with an elected chairman. Of the 15 members of the Board of Management, 12 are elected members and the remaining three are nominated by the Government and the Industrial Finance Corporation. A capital of Rs. 35,50,300 has been invested in the factory, out of which an amount of Rs. 17,70,644 was contributed by the cane-growers and another Rs. 15 lakhs by the State Government. The rest

of the capital was borrowed from co-operative institutions and patrons. The foundation for the factory building was laid on 24th October 1956. Machineries required were obtained from West Germany and their erection commenced in December 1957. With the completion of the factory building and the erection of the machinery, the sugar factory went into production from 14th September 1959. The following table gives particulars of sugar production in the factory from its inception :

	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65
1. Date on which crushing was commenced	14–9–59	15–7–60	2–7–61	4–8–62	17–7–63	5–6–64
2. Date on which crushing was stopped ..	11–1–60	31–3–61	20–4–62	15–2–63	10–2–64	27–3–65
3. No. of days of crushing ..	92	203	226	158	135	250
4. Tonnes crushed per working day (average)	469	686	767	808	780	923
5. Maximum cane crushed on any day (tonnes) ..	820	850	940	1,019	1,000	1,018
6. Recovery % (average) ..	11.11	10.97	11.04	11.69	11.84	11.38
7. Sugar production (tonnes) ..	4,755.4	13,830.9	19,476.4	8,657.0	14,512.2	26,288.6

The amounts realised by the sale of sugar during the period from 1959-60 to 1963-64 were as follows :—

Year	*Amount realised in Rs.*
1959-60 ..	51,28,345
1960-61 ..	1,06,68,297
1961-62 ..	1,11,89,898
1962-63 ..	2,55,27,118
1963-64 ..	1,78,80,835

The table given below gives particulars of membership and share capital of the factory as on 30th June 1964 :

Sl. No.	Type of membership	Number	Share capital subscribed	Share capital paid
			Rs.	Rs.
1.	Grower-Members ..	5,562	16,41,000	15,10,365
2.	Non-Grower members (individuals) ..	454	1,00,300	94,015
3.	Co-operative institutions ..	31	49,200	49,200
4.	Patrons ..	25	2,500	2,500
5.	State Government ..	..	15,00,000	15,00,000
			Total ..	31,47,080

The Pandavapura Sugar Factory, started with a genuine desire to improve the economic condition of the agriculturists of the area, is also providing employment to about 750 persons. The cane required for extraction of sugar in this factory is grown in an area of about 4,000 acres in Pandavapura, Srirangapatna, Krishnarajpet and Mandya taluks.

Paper and Pulp Industry

It is a recognised fact that the paper industry fulfils a great need of the modern society. The increasing population, the growth of literacy, the expansion of industries and commerce and the increasing standard of living—these and other factors demand an increase in the quantity of paper produced. Even then, India's *per capita* consumption of paper in 1963 was estimated at less than 2 lbs. as against 384 lbs. in the U.S.A., 165 lbs. in the U.K., 150 lbs. in Sweden and 46 lbs. in Japan. These figures show the wide disparity in consumption of paper between India and other countries and the progress India has to make in this field.

Mandya National Paper Mills, Belagola

The Mandya National Paper Mills Ltd., Belagola, is the first of its kind in India to produce high grade printing and writing paper by utilising the sugarcane bagasse as the principal raw-material. Hitherto, bamboo has been the main source of raw material for the pulp and paper industry. The progressive denudation of this source made it necessary to utilise an alternative raw material. In this context, the promoters, Messrs. Bedi and Company Ltd., realising the great potential of bagasse as an easily available substitute, commenced negotiations with one of the leading firms of paper machinery manufacturers of the world, Messrs. Parsons & Whittemore, New York, who are the pioneers in the field of research for utilisation of bagasse in the manufacture of paper. The company's efforts were crystallised in the incorporation of Mandya National Paper Mills Ltd., in

November 1956 and the collaboration of Messrs. Bedi and Company Private Ltd., with Messrs. Parsons & Whittemore, New York, resulted in the establishment of this mill.

Bagasse is now employed successfully as basic raw material in many paper mills throughout the world. In Cuba, Colombia, Brazil, Argentina, Formosa, the Philippines and the United States, bagasse is being successfully employed as a primary raw material in the manufacture of pulp and paper products. Until the 1930's, the many tests and experiments on bagasse led to nothing but frustration and failure. Now, however, this raw-material is recognised as being excellent, particularly in those areas where the conventional soft woods are not readily available. Bagasse as such is classified as an agricultural residue along with cereal straw. Bagasse is different from the other agricultural fibres in that it is available in a large quantity at a central location, *viz.*, the sugar mill. The bagasse paper mill, therefore, does not have to own large tracts of land or alternatively collect bagasse from many individual farmers over a wide area.

The paper mill is situated near the Krishnarajasagar dam where adequate land, water, housing and community facilities are available. It lies in the proximity of the Bangalore-Belagola-Mercara Road as well as the Mysore-Arsikere Railway line. Ample quantities of bagasse are being made available for the paper mill by the Mysore Sugar Company, Mandya. In June 1960, the construction of the factory buildings was started and by March 1961, the consignments of machinery began to arrive. The erection and installation of machinery and the construction of buildings were completed in February 1962. The paper mill commenced production on 2nd August 1962.

Paper-making process

The bagasse from the sugar mill is depithed by specially designed Horkel machines at the sugar mills and baled for transportation to the paper company. The pith removed at the sugar mills is recycled to the sugar mill boilers for the generation of steam. The baled bagasse is stored at the paper mill yard and handled by up-to-date conveying systems. The second stage of depithing is effected in a wet process employing a continuous hydrapulper and a Rietz disintegrator. Magnetic separators are located at critical points to remove any tramp iron from the bagasse. These two stages of depithing give a clean bagasse fibre, which is fed to the rapid pulping Pandia digestion system. The Pandia system features a completely electrically interlocked system, which synchronises the various phases of operation. If there is any disturbance at any point in the system, the various units are automatically cut off from operation. This digestion system delivers a very uniform and excellent pulp at a relatively low chemical, steam and power consumption rate compared to

the conventional batch digestion process. The pulp thus produced is remarkably clean and easily bleachable. Another significant point is the ease with which the whole unit can be operated by one man. To supplement the short-fibred bagasse pulp, a rag pulping plant has been installed which can produce approximately 8-10 tonnes of pulp either from cotton linters or rags. The rag pulping plant consists of rag-cutters, dusters, a 13-feet globe digester, a rag-breaker and washer-beaters. Bleaching of rag pulp is also effected in the breakers by a single-stage hypochlorite bleaching. The washed and bleached rag pulp is transported to the finishing beaters.

Good quality writing and printing papers have been successfully produced with 70 per cent of bagasse pulp and 30 per cent of long-fibred pulp. Certain other grades of paper have been produced with 100 per cent bagasse pulp.

Expansion programme

At the time of its commissioning, the Mandya National Paper Mills was geared to produce 35 tonnes of paper daily. But, realising the importance of the paper industry in the State and the availability of large quantities of sugarcane bagasse in the district from the two sugar factories located within a short distance, an industrial licence, to the Mandya National Paper Mills, to manufacture 72 tonnes of pulp and paper per day was issued. The question of expansion of the capacity of the mills was carefully examined by the technical committee constituted by the Industrial Finance Corporation of India. As a result of this, the company is expanding its production capacity to 100 tonnes per day in two stages.

Recently this paper mills was closed down temporarily due to certain difficulties and efforts are being made to re-open it.

Mysore Chemicals and Fertilisers, Belagola

The Mysore Chemicals and Fertilisers Ltd., Belagola, which was sponsored by the Government of Mysore towards the end of 1937 as a joint-stock company, has to its credit the first synthetic ammonia plant established in India to harness atmospheric nitrogen and its utilisation for manurial purposes. In the context of complete absence of coal deposits or availability of any other cheap fuel in the Mysore State, it was decided that hydrogen required for the manufacture of ammonia be generated by the electrolytic process. It was in appreciation of this fact that the Mysore Government came forward in September 1937 with certain concessions for starting this industry, the most important of which was the supply of a large block of power required by the industry at a low rate.

The company was started in November 1937 with an authorised capital of Rs. 25,00,000 and the plant and machinery for the

factory were obtained on a single contract from Messrs. Chemical Construction Corporation, New York, and regular production started from 1940.

Manufacturing plants

The original plant as supplied by Messrs. Chemical Construction Corporation, New York, consisted mainly of the following units :—

Electrolytic Hydrogen Plant and D.C. Generator.—In this plant, distilled water is decomposed into hydrogen and oxygen by passing direct current at 273 volts, 10,000 amps. through a battery of 128 electrolytic cells. The hydrogen produced in this plant is sufficient for an output of five tonnes of ammonia per day. The direct current required for electrolysis is supplied by a large motor generator set consisting of 4,300 H.P. synchronous motor, which is directly connected to a 3,000 KV D.C. generator.

Ammonia Plant.—This plant consists of equipments for separation of nitrogen gas from air and combining the same with hydrogen from the electrolytic hydrogen plant to produce five tonnes of ammonia per day. The electric power requirements of this plant are approximately 400 H.P.

Ammonium Sulphate Plant.—This plant is designed for the production of 20 tonnes of ammonium sulphate per day by utilising five tonnes of ammonia produced in the ammonia plant and 15 tonnes of sulphuric acid from the acid plant. The electric power requirements of this unit are only 20 H.P.

Acid Plant.—This plant is equipped to produce 25 tonnes of acid per day using elemental sulphur. Although the manufacture of ammonium sulphate required only 15 metric tonnes of acid per day, even when the scheme was sanctioned in 1937 it was envisaged that there would be a progressive demand for sulphuric acid by other skilled industries in and around Mysore State and hence, the acid plant was provided with a surplus capacity of 10 more tonnes making a total of 25 tonnes per day. The electrical power requirements of this plant are 60 H.P.

In view of the fact that the economy of the industry depended largely on the availability of electric power at a cheap rate, the Government of Mysore sanctioned a concession rate of 0.125 of an anna per unit, for this industry. It was further stipulated that the above rate be applied till the company made a net profit of 5 per cent on the capital raised and with the increase in profits the above rate would be progressively raised until the normal rate of 0.25 of an anna per unit was applied.

Out of the total power requirements of the factory, namely 5,000 H.P., nearly 4,750 H.P. represents power for the manufacture of ammonium sulphate. The rate has been revised on several occasions, but at no time before 1957 did the rate exceed 0.25 of an anna as originally agreed upon by the Government in 1937. In December 1957, the Mysore State Electricity Board agreed to supply power at 2.7 pies per unit till the end of 1958 and thereafter the rates were the same as those charged for other industrial consumers

Water required for the factory is drawn from the Krishnarajasagar, the company having made its own arrangements for pumping water and disposal of waste water. The existing arrangements for pumping water to the factory is of a total capacity of 3.25 million gallons. Water pumped is mainly used for cooling purposes in the factory and nearly 95 per cent of the water pumped is returned to the channel.

Manufacture of fertilisers

It has been well recognized that in order to get best results by the use of artificial fertilisers on land, it would not be enough if only nitrogenous fertilisers are used and that phosphatic fertilisers play an equally important role. This factory was started with a capacity of five tons of ammonia and 20 tons of ammonium sulphate per day. In view of these uneconomic capacities in the present-day context, steps to expand the existing capacities and to diversify the lines of production have been taken. A scheme for the installation of a new sulphuric acid plant of 50 tonnes a day and a fully mechanised superphosphate plant of 150 tonnes a day has been taken up and both the plants have been commissioned. The total number of workers in the factory in 1965 was about 400. The annual expenses came to about rupees six lakhs. The production value was estimated at Rs. 50 lakhs per annum with a net profit of Rs. 3½ lakhs.

Allied Resins and Chemicals, Belagola

The Allied Resins and Chemicals (Private) Ltd., was started near Belagola in Srirangapatna taluk in 1965, to manufacture urea, farm-aldehyde and resin. As the industrial unit is new, the production figures are not yet available. It comes under the medium-scale group of industries.

Mysore Chemical Manufacturers, Belagola

The Mysore Chemical Manufacturers Ltd., was started in 1938 with its registered office at Tarabanahalli near Chikbanavar in Bangalore district. This company established two factories, one at Tarabanahalli and the other at Belagola in 1940 and 1941 respectively, with a view to manufacturing copper sulphate, sulphate of alumina and alum. Copper sulphate is being produced at the Tarabanahalli factory and the other two products are being manufactured at Belagola. It is interesting to note that this company was the first in India to manufacture copper sulphate. This is an excellent fungicide for spraying coffee,

areca, rubber, grape, paddy, cotton, coconut and other food crops. The sulphate of alumina and alum, which are being produced at Belagola, are used in water purification and textile chemicals.

Mysore Acetate and Chemicals Co., Mandya

The Mysore Acetate and Chemicals Co., Ltd., Mandya was incorporated as a public company under the Companies Act, 1956 on 24th December 1963. The certificate of entitlement to commence business was issued by the Registrar of Companies on 28th May, 1964. The objects for which the company is established are to manufacture, buy, sell, import from or export to any part of the world, cellulose triacetate, secondary acetate moulding compounds, plasticisers, acetic acid, acetic anhydride and all kinds of materials used in the film, plastic and rayon industries and to manufacture all kinds of chemicals and alkalies with their derivatives and by-products.

The company intends to manufacture, with foreign collaboration, about 1,200 tonnes per year of cellulose triacetate of film quality and 2,400 tonnes of cellulose acetate. The cellulose acetate will be converted into moulding compounds by the addition of about 1,200 tonnes of plasticisers and fillers. The Marketing Research Corporation of India Ltd., New Delhi, conducted, at the instance of the Mysore Sugar Company Ltd., a survey regarding the market potential in cellulose acetate, in collaboration with the Economic Intelligence Unit of the Indian Institute of Public Opinion Ltd., New Delhi. On the basis of the research report prepared by them, it is established that cellulose acetate is at present used in India in the plastic industry mainly in the form of acetate moulding powders. There is no production of any of these chemicals in India at present and the whole of the present requirements is being met by imports. Cellulose triacetate is used in the production of raw films, filter tips for cigarettes, in the manufacture of tapes for recorders and sound-recording strips and in the plastic industry. The Hindustan Photo Film Manufacturing Company Ltd., at Ootacamund, which is a Government of India undertaking, will be needing initially three tonnes of cellulose triacetate of film quality per day. Their technical collaborators have approved the technical process under which the cellulose triacetate will be produced by this company with Gevaerts' technology. Therefore, the triacetate to be produced in the Mandya factory will have a ready market. The moulding compounds also have a ready demand from the plastic industry in India. The total anticipated demand for cellulose acetate would be of the order of 6,650 tonnes. The demand for moulding powders by 1966-67 is expected to be 8,000 tonnes and by 1970-71 about 10,000 tonnes. There is thus a very bright prospect of sale of the entire production of the company.

The Acetate Factory is being set up near the Mandya town on the Bangalore-Mysore Road, in the neighbourhood of the

Mysore Sugar Factory. The company has purchased from the Sugar Company 64 acres of land at a cost of Rs. 1,08,475 and a few of the office and residential buildings including a godown have been already constructed at a cost of Rs. 1,21,200.

The company has entered into an agreement with Messrs. Von Kohorn-Universal Corporation, Stanton, California, U.S.A., and Messrs. Acktieabolaget Chematur, Stockholm, Sweden, for the supply of plant and machinery for the manufacture of cellulose triacetate, acetate moulding compounds, together with all the auxiliary facilities. The technical know-how of the well-known firm Messrs. Gevaert Photo Production of Belgium has been secured for the manufacture of cellulose triacetate of the quality suitable for use in photographic films.

The project is estimated to cost about Rs. 415 lakhs, financed through equity issue of Rs. 225 lakhs, made up of Rs. 50 lakhs by the State Government, Rs. 30 lakhs by the Mysore Sugar Company, Rs. 68 lakhs by the collaborators, Rs. 7 lakhs by the Directors and their friends and the balance from the public. Loans have been obtained from the Export-Import Bank of Washington and from the Industrial Credit and Investment Corporation of India. The factory is expected to start production shortly.

Implements Factory

To meet the growing demand for agricultural implements in the district consequent on the implementation of the package programme, the authorities concerned have recently started an Implements Factory at Mandya with an authorised capital of six lakhs of rupees. This factory was inaugurated in July 1966.

Rice Mills

The district of Mandya is a rich rice-producing area with 1,51,391 acres of land under paddy cultivation in 1964-65. The production of paddy has been increasing from year to year in the district as detailed below :

Year	*Area in acres*	*Production of rice in tons*
1959—60 ..	1,39,209	67,503
1960—61 ..	1,32,247	1,04,893
1961—62 ..	1,31,428	1,11,749
1962—63 ..	1,50,955	1,21,684
1963—64 ..	1,40,715	1,26,316
1964—65 ..	1,51,391	1,31,106

These figures indicate the prominence of paddy cultivation in the district and the need for rice mills. It may be said that the rice mill industry is the most wide-spread of all small industries in this district. There were in 1965-66, 82 rice mills in the district. These rice mills are heavily concentrated in Mandya, Pandavapura and Srirangapatna taluks.

Modern Rice Mill project

A team deputed by the Ford Foundation, consisting of experts, inspected several rice mills all over the country and studied their methods of working. They found that there were many deficiencies in procuring, transporting, storing, parboiling, milling and marketing of paddy and rice. After careful assessment of these factors, the team recommended to the Government of India to develop a new method of handling, drying, storing and milling of paddy in order to get the maximum outturn of rice from a given quantity of paddy. It has been suggested by the experts that there is ample scope for obtaining increased outturn of rice from paddy by adopting a combination of steps involving control of moisture, safe storage of paddy and rice, parboiling of paddy and providing modern processing equipment, which include rubber roller shellers, husk separators, paddy separators, improved whiteners, aspirators and the like. The increase in outturn of rice resulting from the use of such equipment would be considerable. A decision was taken by the Central Government to establish six modern rice milling units in six intensive agricultural district programme (package programme) areas in India, as a pilot study and evaluation programme. The Mandya district, which is a rich paddy-growing area in the Mysore State and where the package programme is in operation, was allotted a unit with a capacity of two tonnes per hour.

The Ryots' Agricultural Produce Co-operative Marketing Society Ltd., Mandya, has taken up the implementation of this modern rice mill project. A sum of Rs. 15.25 lakhs has been sanctioned by the State Government for locating a one-tonne unit, in addition to the unit already working. A Japan Satake Mill of 1.2 tonnes capacity which has been installed in the mill area, was inaugurated on 20th May 1965. This mill consists of paddy-feeding elevator, paddy cleaner, paddy elevator and husker with husk aspirator, paddy separator, husked rice elevator, rice whitening machine, rice grader and bran collecting cyclone.

For the storage of paddy in bulk, construction of four silos of a capacity of 1,000 tonnes each and six silos of a capacity of 200 tonnes each was taken up. Four varieties of paddy, *viz.*, Bangara-Sanna, Coimbatore Sanna, Ratnachoodi and Salem Sanna would be stored in the four silos of 1,000 tonnes capacity. The capital cost of the silos was estimated at Rs. 13 lakhs.

The field paddy that comes to the mill is cleaned and dried in a mechanical drier attached to the silos and weighed. The moisture of the paddy is brought to the optimum of 14 per cent moisture content. The dried paddy is then taken through the elevators and conveyors to the silos until they are required for milling. Paddy thus stored in the silos is fully protected against damage from moisture, insects, rodents and birds.

The Central Food Technological Research Institute, Mysore, provided the necessary drawings, design and specifications for the installation of the parboiling unit. Parboiling tanks were under fabrication. The tanks would be attached to the small silos of 200 tonnes each with a boiler. A drier was designed by the Ford Foundation for the drying of parboiled paddy. This method of parboiling removes bad smell and also facilitates decolourisation of the rice. These combined efforts of proper storage and processing are expected to bring about an increase of 80 kilograms in rice outturn per tonne of paddy. This works out to an additional 8 to 10 per cent outturn of rice, which is a contribution to the efforts for making up the food shortage. This modern rice mill was expected to start production in 1967.

Handloom weaving

It is estimated that there are about 5,500 handlooms in the district for weaving of cotton, woollen and silk fabrics. Melkote is known for manufacture of *dhoties,* while Talagavadi in Malavalli taluk, Kodiyala in Srirangapatna taluk and Hosaholalu in Krishnarajpet taluk are noted for manufacture of sarees and shirtings, especially in finer counts. Kikkeri in Krishnarajpet taluk is famous for silk-weaving. More than 4,400 handlooms had been brought into the co-operative fold at the end of the Third Plan period and 19 cotton weavers' societies, four woollen weavers' societies and two silk weavers' societies, had also been organised. Besides being provided with technical advice, the weavers' co-operative societies have been sanctioned a considerable amount of loans for working capital from the funds provided in the plan schemes and also from the Reserve Bank of India. The weavers' co-operative societies have also been supplied with various improved equipments. As per figures supplied by the Department of Industries and Commerce, the total paid-up share capital, during 1965-66, in respect of all handloom societies, came to Rs. 53,444. Under the Reserve Bank Loan Scheme, a total sum of rupees one lakh has been given to promote the handloom industry in the district. In 1965-66, there were 4,293 members in the various handloom societies in the district. During the Second Plan period, a sum of Rs. 1.95 lakhs was spent on various handloom schemes, while a sum of Rs. 6.75 lakhs had been provided under the Third Five-Year Plan for this purpose.

Jaggery manufacture

The Mandya district was famous for jaggery even during the closing decades of the last century. The process of manufacturing jaggery from sugarcane in those days was very imperfect. When the canes were ripe, they were cut into small pieces and carried to the mill, which consisted of two pieces of babul-wood (which were called in those days as *goblis*) worked by a pair of bullocks, and they served as crushing rollers. This contrivance being very imperfect, of the 90 per cent of the sweet juice which the cane contained, only 50 to 60 per cent was usually extracted leaving over one-third in the *sippe* or squeezed cane which, with the dried leaves from the tops of the cane, was used as fuel in the manufacture of jaggery. The juice was forced into a large earthen pot and was subsequently placed in a large iron or copper pan ; afterwards, with the addition of lime, it was boiled and made to run into small wooden moulds. It was then allowed to cool and crystallise into jaggery.

This process of jaggery-making has continued upto the present times, the only change that has taken place being in the process of extracting juice from the cane. Now, iron mortars called *ganas* are used to extract the juice from the canes. In recent years, power-driven machines are also used to extract the cane juice. The district of Mandya, being a sugarcane zone, had about 730 sugarcane crushers in 1965.

Sericulture

Sericulture is one of the major cottage industries in Mysore State. This industry is being pursued in the district as a subsidiary one to agriculture. Approximately, 5,000 families in Mandya, Maddur, Malavalli and Nagamangala taluks are engaged in rearing silk worms. The income derived by the sale of silk-worm cocoons produced by the silk-worm seed rearers goes a long way in improving the economic conditions of the agriculturists. Various trials conducted confirmed that it is an ideal area for the development of this industry. With a view to giving encouragement to this industry, a seed farm was started during 1961-62 at Nagamangala. In this farm, mulberry occupied an area of 8 acres and 37 guntas. The farm has a target of producing Mysore seed cocoons at the rate of ten lakhs per annum. The farm provides also training to cultivators in modern methods of sericulture.

Approximately 9,000 acres of land have been put under mulberry cultivation in the district. There are two Government Grainage Centres located at Malavalli and Maddur. Besides these grainages, there are six Chawki Rearing Centres. There are also four Cocoon Markets and three Service Centres in the district. Besides, there are also a Government Mulberry Graft Nursery and a Training Centre at Maddur. The main functions of these institutions are to prepare and distribute disease-free layings, mulberry grafts, rearing of silk-worms and the like. There

are also a number of private grainages. The cocoons produced in the district are sent either to Mysore or Channapatna for reeling. It is interesting to note that out of the total area under mulberry cultivation in the district, the two hoblies of Boppagowdanapura and Kirugaval in Malavalli taluk, alone accounted for 3,868 acres with 1,750 families engaged in the industry in 1965-66.

Sericulturists in the district are being given by the Government various facilities such as supply of high-yielding mulberry grafts, timely supply of silk-worm seeds at reasonable prices, free technical guidance and advice, financial help for sinking of wells and construction of rearing houses and grainage depots, free supply of seed cuttings and rearing of silk-worms upto the end of second moult in the chawki rearing centres.

Apiry Centres

There are two apiary centres, one at Mandya and the other at Srirangapatna. In order to develop this industry, private bee-keepers are being provided with all necessary facilities. The two apiary centres are managing 286 private and 67 Government bee-hives. The annual yield of honey in the district is about 1,000 kilograms. Bee-hive boxes and honey extractors are being distributed to agriculturists through development blocks at 50 per cent subsidised rates. The following figures show the number of bee-keepers and the quantity of honey produced at the two centres in the district during 1965-66 :

Centre	*No. of bee-keepers*	*Quantity of honey extracted*
Mandya ..	112	1,273 lbs
Srirangapatna ..	101	1,560 lbs

Coir Industry

As the Maddur taluk is rich in coconut plantations, the coir industry is being developed in the vicinity of Nidaghatta, on the Bangalore-Mysore road by setting up a mechanised coir unit. This unit is being run on co-operative lines.

Registered Small-scale Industries

A system of collecting important particulars of smaller industrial units in order to help them, wherever necessary, by way of financial aid, technical advice, supply of basic raw materials and other commodities, was started by the Directorate of Industries and Commerce during 1960-61. The small industrial units were requested to get themselves registered in the said Directorate and to furnish quarterly production statistics in the prescribed proforma so as to enable the Government to have a clear picture of the position of small-scale industries in the State.

As on 31st March 1967, there were, in all, 54 registered industrial units in the district. The following table indicates

the names of these industrial units, the products they manufacture and their capital investment :—

Registered Small-scale Industrial Units in Mandya District as on 31st March, 1967.

Sl. No.	Name of Industrial Unit and its location	Products manufactured	Capital invested
1	2	3	4
			Rs.
1.	Ashoka Engineering Works, Maddur.	Drums, buckets, stoves, etc.	20,173
2.	Balasubramanya Oil Mills, Maddur.	Groundnut oil and oil-cake.	Not available
3.	Besagarahalli Saw Mills, Maddur taluk.	Wood works ..	31,190
4.	Bhagwan Industries, Mandya	Printing and book-binding.	Not available
5.	Bharat Rice Mills, Besagarahalli, Maddur taluk.	Paddy hulling ..	60,000
6.	Carpentry and Smithy Production Centre, Pandavapura Taluk Rural Industrial Co-operative Society, Pandavapura.	Agricultural implements	37,620
7.	Cart Manufacturing Industries, Halagur, Malavalli taluk.	Carts and wooden furniture	9,200
8.	Chandrashekhara Rice Mills, Hanakere, Mandya taluk.	Paddy hulling ..	15,000
9.	Charles D'Souza, Metal Merchant and Manufacturer, Malavalli.	Copper and brass utensils.	2,000
10.	Chinnaswamy Saw Mills, Malavalli.	Wood works ..	25,000
11.	D. Kannan Babu, Mandya	Agricultural implements	Not available
12. to 14.	Dayananda Engineering Works, Mandya (3 units)	Agricultural implements, iron gates and grills, gun-metal bushes and bearings for sugarcane crushers.	34,471
15.	Evershine Industries, Mandya	Structural works ..	30,000
16.	G. R. Industrial Works, Mandya	Agricultural implements.	3,500
17.	Ganesh Industries, Mandya	Agricultural implements	Not available
18.	Gangadhara Press, Maddur	Printing and book-binding.	14,000
19.	Goldsmiths' Industrial Co-operative Society, Bellur, Nagamangala taluk.	Copper and brass utensils	22,000
20.	Gopalakrishna Industries, Mandya.	Agricultural implements	2,500
21.	H. K. Kempanna, Hunasanahalli, Srirangapatna taluk.	do ..	1,000

1	2	3	4
			Rs.
22. to 24.	H.M.S. Industries, Mandya (3 units)	Agricultural implements, consumer goods, gates and grills, stainless steel articles and automobile works.	43,835
25.	Hafizulla Khan, Nagamangala	Carts and agricultural implements.	10,600
26.	Harihareshwara Rice Mills, Hariharapura, Krishnarajpet taluk.	Paddy hulling ..	15,000
27. & 28.	I.J.S. Industries, Mandya (2 units)	Agricultural implements and automobile repairs	22,000
29.	J. F. Industrial Works, Mandya	Agricultural implements and consumer goods.	4,300
30.	Jagannatha Metal Industries, Mandya.	Copper and brass utensils.	6,000
31.	Jai Hind Saw Mills, Mandya	Timber sawing and wood works.	35,000
32.	K. Puttaswame Gowda, Konnapur, Malavalli taluk.	Silk rearing	9,500
33.	Kalikamba Industrial Works, Pandavapura.	Agricultural implements	45,000
34.	L. A. D'Souza, Metal Merchant and Manufacturer, Malavalli	Copper and brass utensils.	5,000
35.	M. J. Sufi Azizia, Katherkatta village, Krishnarajpet taluk.	Essential oils ..	7,000
36.	Madappa Industries, Holalu, Mandya taluk.	Agricultural implements	2,200
37.	Malnad Wood Industries and Saw Mills, Mandya.	Timber-sawing and wooden furniture	66,500
38.	Mandya Engineering Works, Mandya.	Agricultural implements	25,000
39.	Mandya Saw Mills, Mandya	Wooden furniture and sawing of timber	1,40,000
40.	N. Nagoji Rao & Sons, Ganjam, Srirangapatna.	Carts and wooden furniture	19,000
41.	National Dairy and Poultry Farm, Belavadi, Srirangapatna taluk.	Pasteurisation of milk ..	3,50,000
42.	New Engineering Works and Saw Mills, Nagamangala.	Agricultural implements and wood works.	3,000
43.	Peewee Industries, Mandya	Buckets, water cans etc.	3,000
44.	Rahmat Bright Metal Industries, Mandya	Non-ferrous metal products.	35,000
45.	Royal Industries, Mandya	Agricultural implements	14,000
46.	Ryots' Agricultural Produce Co-operative Marketing Society, Ltd., Mandya.	Agricultural implements	1,67,200
47.	Sarvodaya Printing Press, Mandya.	Printing and book-binding	Not available

1	2	3	4
			Rs.
48.	Siddappaji Industrial Works, Mandya.	Agricultural implements	17,000
49. & 50.	Silk Rearing Industries, Halagur, Malavalli taluk (2 units)	Silk-rearing ..	13,050+ 9,000
51.	Srinivasa Rice Mills, Mandya	Paddy hulling and preparation of boiled rice.	Not available
52.	Star Industries, Mandya	Agricultural implements	8,500
53.	Venkatesh Coffee Works, Karthal, Krishnarajpet taluk	Coffee powder	Not available
54.	Venkateshwara Rice Mills, Pannedoddi, Maddur taluk.	Paddy hulling	94,000

These 54 registered industrial units included 19 units manufacturing agricultural implements, six wood works, five rice mills, four units manufacturing brass and copper utensils, three units manufacturing gates, grills, etc., three silk-rearing units, three printing and book-binding units, two automobile works, two units manufacturing essential oils and seven other units of various types.

Cottage Industries

The Malavalli town is an important centre for the manufacture of leather chappals. There are about 1,000 cobblers in this town. Maddur, Seelanere, Hullegala and Belligere have a large number of potters. Mat-weaving is the main occupation of a number of people in Nagamangala and Sindaghatta. There are also traditionally skilled artisans in Nagamangala, who make brass images and other artistic articles of utility.

Industrial Co-operatives

There were, in 1965, 61 industrial co-operatives in the district catering for the financial and technical needs of village and small-scale industries. Out of these, three were small-scale industrial co-operative societies, *viz.*, (1) Srirangapatna Taluk Carpentry and Smithy Workers' Co-operative Society Ltd., Ganjam, (2) Vishwakarma Craft Co-operative Society Ltd., Mandya and (3) Carpentry and Smithy Craft Co-operative Society, Halagur, Malavalli taluk, the first two societies being the more important ones.

The Srirangapatna Taluk Carpentry and Smithy Workers' Co-operative Society, Ltd., Ganjam was organised in 1957. It has constructed a godown at Ganjam for storing the raw materials. The members of the society are engaged in the manufacture of

carts, furniture and agricultural implements. A sum of Rs. 10,750 had been granted to this society by Government by way of loan and grant.

The Vishwakarma Craft Co-operative Society Ltd., Mandya, was organised for the benefit of carpenters and smiths of the area. It provides employment to about 80 workers. Besides providing technical advice, the Government have granted a financial assistance of Rs. 89,820 by way of loan and grant to the society. Arrangements have also been made for the supply of timber to this society from the Forest Department at concessional rates.

The Srinivasa Medar Workers' Co-operative Society, Halagur, Malavalli taluk and the Vishwakarma Craft Co-operative Society, Nagamangala were the more important Handicrafts Co-operative Societies in the district. Under the goldsmiths' co-operative scheme, two goldsmiths' societies, *viz.*, the Goldsmiths' Industrial Co-operative Society Ltd., Bellur, Nagamangala taluk and the Akkasaligara Kushala Kaigarika Sahakara Sangha Ltd., Mandya, have been organised.

Home Industrial activities

The Department of Industries and Commerce is giving monthly grants-in-aid to home industries and institutions in the State for undertaking home industrial activities such as tailoring, embroidery, knitting, rattan work, mat-weaving and cloth weaving. Besides, equipment like sewing machines, weaving looms have also been supplied to some of the institutions. Technical assistance, if required by the institutions, is also provided. At present, the following Samajas are receiving monthly grants-in-aid in this district :

Sl. No.	Name and location of Mahila Samaja	Maintenance grants given during 1964-65	Equipment grants given during 1964-65
		Rs.	Rs.
1.	Mahila Samaja, Mandya town, Mandya.	360	760
2.	Sharada Mahila Samaja, Sugar Town, Mandya.	602	..
3.	Mahila Samaja, Krishnarajpet	360	..
4.	Vasantha Mahila Samaja, Bellur, Nagamangala taluk.	360	..
5.	Sharada Mahila Samaja, Nagamangala.	360	600
6.	Cauveri Mahila Samaja, Shivasamudram.	360	850
7.	Yadugiri Seva Samaja, Melkote.	360	..

Training facilities

With the rapid pace of industrialisation and technological development, the need for qualified and trained men is keenly felt. Training facilities not only encourage the local talent, but also harness the same to fruitful productive activity. Realising the significance of such training facilities, the Government have been developing suitable training institutions for the purpose.

Artisan Training Institute, Nagamangala

The Artisan Training Institute, Nagamangala, started functioning from 1st October 1959. The candidates for training are deputed from various development block areas. This institute imparts training in smithy, carpentry, wool and cotton weaving, sculpture, non-ferrous metal works (brass) and tailoring.

During the year 1965-66, one hundred candidates were trained here. A maximum of twenty-five candidates are admitted for training in each craft, *viz.*, carpentry, smithy, non-ferrous metal, cotton weaving and wool weaving. Candidates of the age group, fourteen to thirty years, having passed the primary fourth standard are eligible for admission. A period of 18 months has been fixed for each craft for institutional training followed by an in-service training of six months in any model workshop, factory or private institution. Each trainee is paid a stipend varying from Rs. 20 to Rs. 30 per month for the entire period of training.

Training Centre for Leather Workers, Malavalli

Production of good leather is essential for the manufacture of quality footwear which is in great demand. The Training Centre for Retanning and Rerolling of Bark-tanned Leather, Malavalli, was started with a view to providing training to the artisans in this craft with the use of chemicals and modern equipment. The duration of training is one year and 15 trainees are admitted at a time. Each trainee is paid a stipend of Rs. 25 per month during the period of training. Besides imparting training, the centre has also been designed to serve as a common facility centre to the tanners in getting their leather processed on a nominal payment. This centre is managed by a Foreman assisted by two Mechanics. The Assistant Director, Industries and Commerce, is in over-all charge of the centre.

With a view to extending training facilities in manufacture of artistic brassware, a scheme to start a training centre at Nagamangala had been approved.

Financial assistance

The Mysore State Financial Corporation had sanctioned a sum of Rs. 55,000 as security loan to the rice mill industry of the district upto 1964-65.

A sum of Rs. 40,000 had been sanctioned under the State Aid to Industries Act, 1951, upto March 1965, for the development of chemical industry in this district. During 1962-63, an amount of Rs. 2,000 was sanctioned for starting a jaggery-manufacturing

industry at Marasinganahalli in Maddur taluk, while subsequently a further sum of Rs. 9,600 was granted for a similar purpose. Besides, the Mysore Central Co-operative Rural Industrial Financing Bank had sanctioned, upto 1964-65, a total financial assistance of Rs. 10,56,350 under its "security loan scheme", "liberalised small-scale industries programme" and "surety loan scheme" to the several industrial units in the district. The District Industrial Co-operative Bank Ltd., Mandya, which was established during 1963-64, is giving financial assistance to various industrial units on short-term basis.

Supply of machinery on hire-purchase basis

The Department of Industries and Commerce helps small-scale industrial units to obtain modern machineries on a hire-purchase basis through the National Small Industries Corporation, New Delhi. Upto 1965-66, about 120 small-scale industrial units in the district had been recommended to the National Small Industries Corporation, New Delhi, for supply of machineries on a hire-purchase basis. The types of machineries recommended were lathes, bandsaws, drilling machines, grinding machines, motors, blowers, paper-cutting machines, shearing and shaping machines and the like.

Industrial Estates

To overcome the difficulties created by the absence of proper locational facilities, power and water supply and communications for the development of small-scale industries, a net-work of industrial estates with different types of worksheds, providing accommodation and planned layout has been provided by the Government. In this district, two industrial estates, one at Mandya and another at Nagamangala, are being established with the following provisions :—

Location of Industrial Estate	*Estimated cost*	*Number of worksheds*
Mandya ..	Rs. 2.33 lakhs	10
Nagamangala ..	Rs. 1.50 lakhs	6

It is expected that these estates will start functioning shortly.

Development Areas

Development areas are plots of developed lands to be made available to the small-scale industrial units so that they may have the advantage of common services and other facilities like good site, electricity and water supply and sanitation. The sites would be available to small industrialists either on outright sale or on hire-purchase basis so that they can put up their own worksheds of approved designs.

The estates and development areas would be provided with a common facility centre or a workshop equipped with necessary modern machinery, which the small industrialists cannot afford

to purchase individually. The centre, in addition to affording services to the industries on payment of nominal service charges, would disseminate technical know-how to the workers engaged in the industries located in the estate.

Industrial potentialities

There is ample scope in the district for starting a number of industries, both resource-based and demand-oriented. Among the resource-based industries, the following are of special importance :—

(1) Paper from bagasse,

(2) Khandasari sugar,

(3) Leather footwear and other leather goods,

(4) Cement and asbestos products, and

(5) Rice bran oil.

There would be three sugar factories in Mandya district if the one proposed at Maddur is also set up. The production of bagasse by the two existing sugar factories is about 700 tonnes per day. Every day, a mountain of bagasse is thrown out of the factories at Mandya and Pandavapura and was hitherto burnt as fuel. To exploit this source of raw material and to manufacture superior quality of paper out of it, a new factory has been started at Belagola which uses a part of the bagasse produced in these two factories. However, with the setting up of a third sugar factory at Maddur, there will be still larger quantities of bagasse, which would facilitate the setting up of small paper factories, as plenty of straw is also available in the district.

Sugarcane is available in the district in plenty. Even though there are a number of cottage units manufacturing jaggery, there is none making khandasari sugar on a large scale. One or two factories with a daily crushing capacity of 50 to 100 tonnes can be started. The favourable locations, according to the Small Industries Service Institute of the Government of India, would be Bannur and Malavalli.

There is a concentration of the chammar community in Malavalli taluk. The footwear made by the cobblers here are popular and are sold all over the district. The artisans follow the traditional method of leather stitching. They may be trained in the use of modern machinery for the manufacture of quality leather footwear. They may also be taught the techniques of manufacture of leather goods such as suitcases, hand bags and medicine chests. There is scope for starting a modern well-equipped unit for the manufacture of these items.

Among the minerals available in the district, the important ones are asbestos and corundum. These minerals are not commercially exploited at present. The prospects of manufacturing cement asbestos products and aluminium sulphate can, therefore, be examined. The large number of rice mills in the district afford scope for starting units for the extraction of rice bran oil.

Agricultural implements, builders' hardware, mixed fertilisers, bricks, rice mill parts and parts required by sugar mills are some of the industries that can be started on considerations of demand factor alone. The Mandya district is now under the package programme for the intensive development of agriculture. As a result, the demand for agricultural implements and mixed fertilisers has increased considerably and will continue to be so in future. The existing units manufacturing agricultural implements are mostly cottage units, which follow traditional methods of making implements. There is scope for starting a few more modern units in addition to the existing works for the manufacture of improved agricultural implements such as ploughs, weeders and inter-cultivators.

At present, about 22,000 tonnes of fertilisers are consumed in the district every year. Even though there is one large-scale factory in the district manufacturing mixed fertilisers, there is scope for starting a few small units. Mandya town has a fairly developed market and acts as a principal distributing centre to other towns in the district. The demand for builders' hardware as well as bricks is increasing with the increased tempo in constructional activities. A few units for the manufacture of builders' hardware and bricks can, therefore, be started.

Metallic components

The sugar factories require a number of metallic components such as brace bearings, pump impellers, vacuum pump pistons, pump shafts and cane knives for replacement. They also require a number of castings. The total value of the components required by the Mysore Sugar Company, Mandya, is estimated at about Rs. 10 lakhs annually. However, this factory has a workshop of its own for the manufacture of many of the components required by it. The expansion of the workshop capacity is also under contemplation by the company. There does not, therefore, appear to be much scope for starting small units for manufacturing and supplying the components required by the Mysore Sugar Company. The sugar factory at Pandavapura, on the other hand, has not set up any such workshop and it is understood to be buying components valued at Rs. 4 lakhs per annum from outside Mandya. It is gathered that several of the components required by this company can be manufactured on a small-scale basis. The possibility of establishing one or two units for manufacturing

the components required by the Pandavapura Sugar Factory can, therefore, be examined.

As mentioned earlier, there are a number of rice mills in the district which are understood to be buying replacement parts valued at rupees one lakh per annum. It is felt that there is a possibility for a small-scale unit being put up at Mandya, for taking up the manufacture of the rice mill machinery parts. Among the other industries which have prospects of growth in the district are confectionery, automobile workshop, tiles and wooden furniture.

Welfare of Industrial Labour

The Mandya district, which is being industrially developed, has already a considerable number of industrial labourers in its big industrial concerns like the sugar mills at Mandya and Pandavapura and paper mills and fertiliser factory at Belagola. A brief account of the labour welfare measures provided in these factories is given below.

In the Mysore Sugar Co., Ltd., Mandya, several welfare amenities such as free medical aid, education for the employees' children, anti-malarial spraying work, free milk distribution, residential accommodation, foodgrains distribution at concessional rates, recreation clubs, parks, swimming pool have been provided for the benefit of the workers of the mills.

The Sahakara Sakkare Karkhane at Pandavapura is running an allopathic dispensary, and the workmen and their families are given free medical aid. Adequate health measures have been taken to prevent the spread of communicable diseases. In order to provide residential accommodation to the workers, the factory management has acquired 40 acres of land at a place two miles from the factory and has constructed about 200 houses. Construction of 50 more houses had been sanctioned. This colony is called Visvesvaraya Nagar after the illustrious engineer-statesman, the late Dr. M. Visvesvaraya.

A *balamandira,* an upgraded primary school and a high school are being conducted by the factory for the benefit of the children of the employees and also the cultivators of the area. An omnibus has been provided to take the children of the employees to and from their schools at Pandavapura.

The Mysore Chemicals and Fertilisers, Ltd., Belagola, also provides ample amenities to its workers. Educational facilities are being provided to the children of the employees; a well-equipped primary school is being maintained. Adult literacy classes are also being conducted for the employees. As regards accommodation, small quarters are provided in the vicinity of the

factory for the low-paid employees. Among the other amenities provided may be mentioned a canteen, a rest hall and a creche.

Efforts are under way to provide necessary welfare facilities to the employees of the Mandya National Paper Mills, Ltd., Belagola. Action has been taken to provide housing accommodation and the Mysore State Housing Board has undertaken to build 300 tenements at the mill site at a cost of Rs. 10,45,000. In addition, the company itself has undertaken a housing scheme for supervisory staff at a cost of Rs. 4,50,000 under the Subsidised Industrial Housing Scheme. (*See* also Chapter XVII).