Chapter - 19

Industry

Industrial Development in India :

The development of cottage industries in India dates back since the ancient times, the evidences of which can be seen in the Indus valley civilization. During that time, cotton clothes, utensils of bronze and pottery items were made in India.

India excelled in ship - building till the 18th century. India attracted the gold of the majority of countries in exchange of superior quality garments, jewellery, metal utensils and other decorative and prestigious items. That is why, India was known as the 'Golden Bird'. But during British rule, the exploitation policy of the britishers and the development of Industrial Revolution ruined the Indian handicrafts. India became a market for sending the raw material and getting readymade goods.

Two kinds of industries got promotion in this period (1) The british industries were unable to meet the demands of the Indian markets, cotton and woolen textiles, cement and paper Industry. (2) Such industries whose raw materials were not beneficial for sending to Britain, as sugar and jute industry.

An unsuccessful attempt was made in Iron and steel industry in 1779 in the Arcot district of Tamil Nadu. The effort made at Burnpur in Kulti in 1872 was successful and is still in operation.

The Aluminium Industry was started in 1837 in J. K. Nagar in West Bengal. The first unsuccessful attempt of cement was made in 1904 in Chennai. In the field of chemical fertilizer industry, the super phosphate plant was established in 1906 in Ranipet, Tamilnadu.

For this, an industrial policy was formulated in 1923 with the purpose of earning profits from the situations of the world- war, by doing industrial development. Many industries were established in this period, but the partition of the country gave a severe blow to the Indian Economy.

The shipping Industry was established in 1941 in Vishakhapattnam by the name of Hindustan shipyard. The first mill in paper industry was established in Sirampur, West Bengal which failed, in Lucknow in 1879 and in Titagarh, West Bengal in 1881.

The unsuccessful attempt in cotton textile Industry was made in 1818 in Fort Glaster (Kolkata). The first successful cotton mill was established by Dabur in 1854 in Mumbai. The first woolen textile mill was established in 1876 in Kanpur by the name of 'Lal Imli'.

With the support of govt, Iron and steel, sugar, cement, glass, soap, vegetable oils, Engineering Industries were established in the mid of Second World War and later also, but their development was limited.

In order to fulfill the economic and social objectives after independence, the industrial policy was declared for the first time on 6th April, 1948, the purpose of which was to lessen the regional imbalance. For this reason, the majority of govt. Industries were set up in the backward areas. India chose its development based on a mixed economy. The National Economic commission was established in 1950, it made possible the overall development in the country by means of well planned 5 year plans and India became self-dependent.

In this chapter, we shall study some important industries of India such as Iron and Steel, Aluminium, Cement, Cotton Textiles, Sugar and Engineering Industry.

Iron and Steel Industry :

Iron and steel is a basic industry, the products of which are essential in the making of all other products. This industry lays the foundation for the industrial development of any country.

The work of melting and moulding iron and making steel in india was done by the Agariya caste in India since very ancient times. The iron-steel made by them was of superior quality. Based on historical evidences, the Swords made in the city of Damascus in Western Asia were built with the Indian steel. The Iron pillar of Ashoka the great, near the Qutub-Minar in Delhi, is 1700 years old. It is a unique example of steel. It faces the consequences of cold, heat and rains and is still the same. It has no rust at all. It reminds us of the knowledge of advanced form of iron-steel making art in India. The Indian cottage industries suffered a setback due to the establishment of modern workshops and India became an importer of iron and steel from an exporter.

The Iron and Steel Industry started in 1870 in India, when the Bengal Iron Works company established its plant at Kulti near Jharia (West Bengal). This plant could only manufacture the pig iron.

The Modern form of Iron and steel Industry in India was laid originally by Jamshedji Tata. He established a modern plant naming Tata Iron and Steel Company (TISCO) at a place called Sankchi (present Jamshedpur) in 1907. Later, the Indian Iron and Steel Company (IISCO) was established at Burnpur in 1919. Both these units were established in the private sector. In 1923, the first unit in the public sector was started with the establishment of Vishveshvaraiyya Iron and Steel Works (MISCO) at Bhadravati. The plants at Bhilai in Chhattisgarh (with the co-operation of the former U.S.S.R.) Durgapur in West Bengal (with the co-operation of Britain) and Rourkela in Orissa (with the co-operation of the West Germany) were established.

The two plants at Kulti and Hirapur were merged into the Indian Iron and Steel company in 1936. Burnpur was also merged into it in 1953 and IISCO had 3 units in all (Kulti, Hirapur and Burnpur).

The maximum use of present capacity of these plants was done in fourth five Year plan and new steel plants were established at Salem (Tamil Nadu), Vijaynagar (Karnataka) and Vishakapatnam (Andhra Pradesh). An increase in the steel producing capacity became possible with the completion of the first phase of the Bokaro steel plant in 1978.

The govt. established the steel Authority of India Limited (SAIL) in 1974 and the work of developing the steel industry was assigned to the company. The company was made responsible for the management of Integrated steel plants, after including the units at Bhilai, Durgapur, Rourkela, Bokaro and Burnpur.

On July 14, 1976 the govt. took the ownership of IISCO in its hands and merged it into the SAIL. The merger was considered effective from April 1, 2005 and the total no. of integrated units under SAIL became five.

According to the year 2014, India stands fourth after China, Japan and the U.S.A. in the production

of raw steel (86.5 million tonnes). It has come up at the third place in 2015.

The total production of pig iron was 9.694 million tonnes, sponge iron was 20.38 million tonnes and total ready steel (Alloy +Non-Alloy) was 91.45 million tonnes in India in the year 2014-15. In the year 2014-15, India imported 9.32 million tonnes ready steel and exported 5.59 million tonnes.

Localisation of the Industry :

The raw material used in Iron & Steel industry such as coal, Iron-ore, Limestone, manganese etc. is heavy and cheap. Hence it is not economically feasible to take it to distant places. That is why, the majority of Iron & Steel industries are set up at the places where raw materials are available.

In order to make a ton of pig iron 1.5 tonnes iron-ore, 1.4 tonnes coal, 0.3 tonnes limestone, 0.1 tonnes manganese and 0.1 tonnes dolomite is required. Due to this reason, the Iron and Steel plants of the world are established near the mines of coal and iron. Besides this, water, economical transport, capital, skilled labour, nearness to market are also essential.

In India the industry has been established at 4 regions with different conditions -

1- Nearby the Coal fields - Burnpur, Hirapur, Kulti, Durgapur, Bokaro.

2- Nearby the Iron-ore fields - Bhilai, Rourkela, Bhadrawati, Salem, Vijaynagar (Karnataka)

3- In between the coal and iron-ore fields - Tata Steel Plant.

4- Coastal Areas and facilities of trade - Vishakhapattanam (Andhra Pradesh)

1. Tata Iron and Steel Company (TISCO) :

Tata Iron and Steel Company is the first biggest plant of India, where 20% of the total steel of India is produced. Besides steel, iron-girders, railway equipment, and thorny wires are also manufactured in this plants.

After the expansion of 2 phases, 2400 crore has been arranged for the expansion of the third phase, after which the total production capacity will become 30 lac tonnes raw steel and 27 lac tonnes saleable steel.

Tata Iron and steel is located very nearby to the Mumbai - Kolkata Rail-route. The plant receives adequate water from the Swarnarekha, Khar and Koi rivers, iron-ore from Noamandi and Badam Pahaar. Coal is obtained from Jhariya, Raniganj and Bokaro.

The kolkata port is at a distance of 240 kms. which provides the facility of import of machines and export of steel.

2. Indian Iron and Steel Company (IISCO) :

It was established in 1874, two units were again included in Burnpur and the company now had three units - Kulti, Burnpur and Hirapur. All these 3 plants are well-connected by rail-routes. Kulti is located at Barakar River and is 215 km away from Kolkata. Hirapur is 6 km away from Asansol and Kulti is 11 km. At Hirapur, raw iron (pig iron) is prepared, which is further converted into steel at the Kulti plant. It is sent to Burnpur from here, where usable sheets, rods, pipes, railway - sleepers, angles, wire, etc. are made by means of rolling mills. All these 3 units work in union. Their management came entirely into the hands of public sector SAIL since 1976.

The annual capacity of steel production of this plant is 10 lac tonnes, which has been raised to 23 lac tonnes.

All the 3 plants of the Indian Iron and Steel Company are located near the Damodar valley coal fields (Raniganj, Jharia, Ramgarh) at the Kolkata-Asansol Rail-route.

Iron-ore is obtained from Singhbhum (Jharkhand) and water from Barakar, a tributary of Damodar River.

3. Vishveshvaraiyya Iron and Steel Company Limited

This company was established in 1923 at a

place called Bhadrawati located along the banks of river Bhadrawati in Karnataka.

It is located near the iron-ore areas of Bababudan hills and Kemangundi. It gets limestone from Mandiguda and dolomite from Shankarguda. After wood-based coal, hydro-electricity is obtained now from Shivsamudram. The production capacity of the plant was 1 lac ton which is now increased to 1.3 lac tonnes.

Specific and alloy kind of steel is made at this plant. It is under the ownership of SAIL now.

4. Rourkela Steel Plant :

This plant of Hindustan steel limited, located at the meeting point of Sakh and Koel rivers in Sudergarh district of Odisha was established with the co-operation of Kroops and Dimag companies of Germany.

The plant's set up was based on nearness to raw material, which lessens the cost of transport. Raw materials are obtained from various places such as Iron-ore from Keonjhar and Sundergarh districts of Odisha, Coal from Jharia, Jharkhand, manganese from Keonjhar, limestone from Veer Mishrapur. Hydel-power is obtained from Hirakud and water from Foyal and Shankh rivers. Transport-facility is made available from the Kolkata-Mumbai rail-route.

At Rourkela, maximum flat- shaped goods, plates of varying thickness, blades, sheet of tin are manufactured. They are used to make ship and railway coaches. Its capacity is 16.71 lac tonnes steel.

The sub-products are light oils, oil, naphthalene oil, Bosh-oil, Anthracin oil, pitch etc. A plant with a capacity of 10 lac tonnes has been established to produce nitrogen and fertilizers

5. Bhilai Steel Plant :

This plant has been established at a place called Bhilai, 21 km away from Raipur in Chhattisgarh, with the co-operation of Russia. It is considered as a successful and ideal plant of India. Initially, the production capacity was 10 lacs tonnes, which has been increased to 52 lacs tonnes. Iron-ore is obtained from 32 km away Dalli -Rajhara Hills, coking coal from coal fields of Kokha, Chhattisgarh and Karmali (Jharkhand), manganese from Balaghat - Bhandara, Dolomite from Raipur, clean water is obtained from Tandula Dam. It is located on Kolkata - Mumbai rail route. The major part of produced steel goes to the Visakhapattnam Hindustan shipyard.

6. Durgapur Steel Plant :

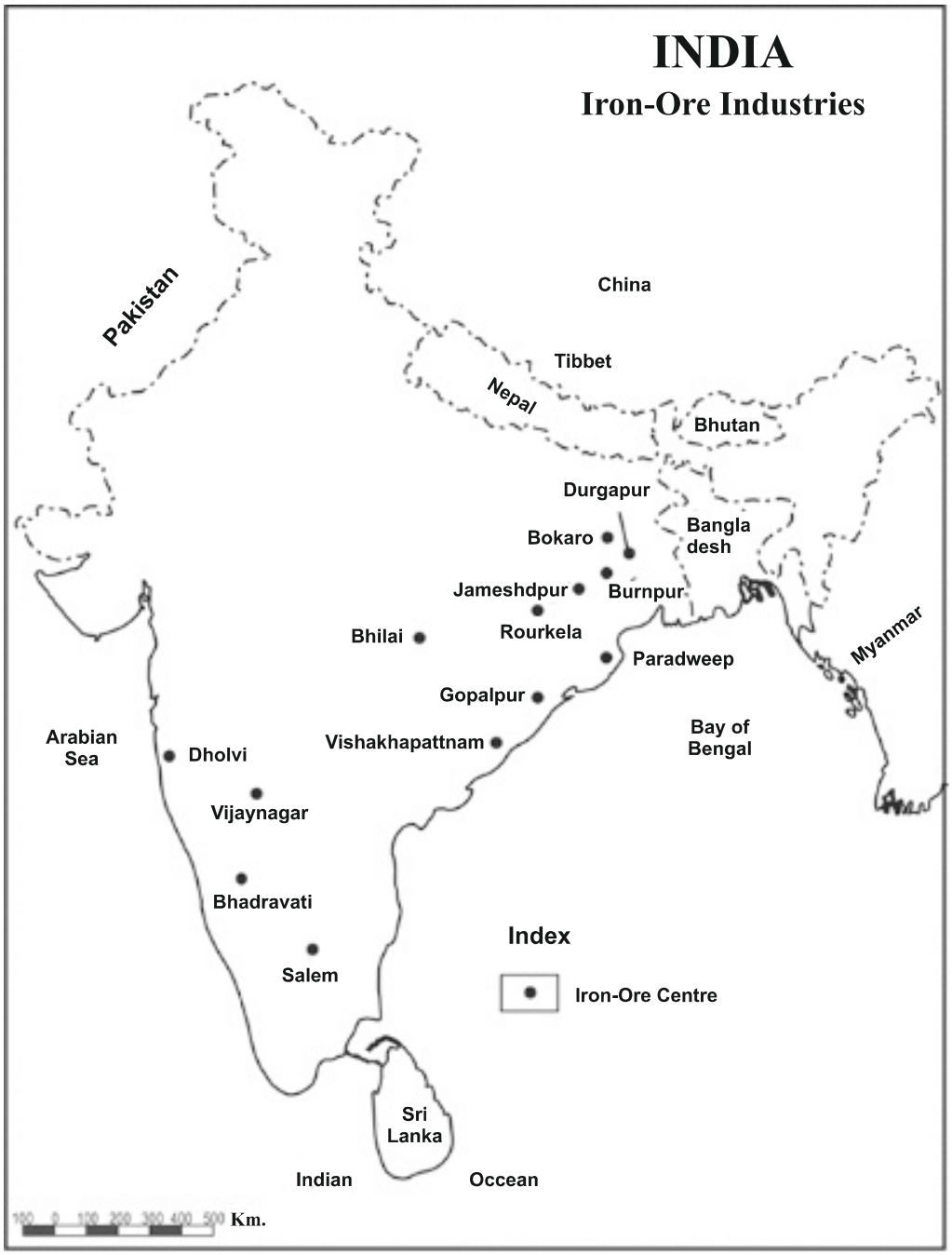
This plant was established in Vardhman district of West Bengal at Asansol-Kolkata rail route on the bank of the river Damodar with the co-operation of the British government. Presently this plant is run by the SAIL.

Coal is obtained from the mines of Raniganj, Jharia and Bokaro and Hydel power from the DVC. Iron-ore is obtained from Noamandi and Gua mines, limestone from Keonjhar and Sundargarh, manganese from the Badajamada mines of Keonjhar. Nearness to Kolkata provides the facility of port. The production capacity of the plant is 40 lac tonnes. Rail wheels, Railway lines, axis, rods etc are manufactured here.

7. Bokaro Steel Plant :

The fourth plant of Hindustan Steel Limited was established at the meeting point of the Bokaro and Damodar Rivers with the co-operation of Russia. The production capacity was 17 lacs tonnes in 1972, which has been increased to 40 lac tonnes at present. The production capacity for future is proposed to be 100 lac tonnes.

Iron-ore for this plant is obtained from the Kiriburu mines of Keonjhar in Odisha, limestone from the district of Palamu, coal from Jharia and electricity is obtained from the Damodar valley corporation. Water is obtained from the Bokaro and Damodar rivers. It is well- connected to Kolkata by rail routes and roadways.



Map 19.1 : India : Iron ore Industry

8. Vishakhapattnam Steel Plant

It is the first Steel Plant of India located at a port. It has been built on the basis of ultra - modern techniques. Iron-ore is obtained from bailadila mines, coal from Damodar Valley, manganese, dolomite and limestone from the mines of Chhattisgarh and Odisha. Being located on a port, there is a facility of the export of products.

In 2008 - 09, 29.4 lac tonnes hot metal, 26.2 lac tonnes liquid steel and 23.8 lac tonnes saleable steal was produced in this plant.

9. Vijaynagar Steel Plant

Located at Vijayanagar in Hospet district of

Karnataka, it is fully based on our own techniques. Its production capacity is 32 lac tonnes of superior quality steel, which is proposed to be doubled. Superior quality iron-ore, limestone and dolomite etc are available in abundance in this area. Soft steel production is a characteristic feature of the plant.

10. Salem Steel Plant :

A mixed steel and iron mixed steel plant was established at Salem in Tamilnadu. Production is being done here since 1982. Magnetite iron, limestone, dolomite is available in abundance from the nearby areas. Coal is obtained from Neyveli Lignite. Production of rust-free steel is also done. Its annual capacity is 70,000 tonnes rust free steel 75,000 tonnes silicon steel 30,000 tonnes special quality steel and 20000 tonnes soft steel is produced.

National Steel Policy :

The National Steel Policy was accepted by the central government on November 2, 2005, under which target has been fixed to increase the production from 4 crore 21 lacs tonnes to 11 crore tonnes by the year 2019 - 20. In order to achieve the target, there is a possibility of investment of approximately 2.5 lac crores by the private and public sector.

In addition to it infrastructure facilities will also be expanded and financial motivation will be provided to increase the production. The objective of this policy is to bring the cost of production at the global level and to encourage the competition for the development of quality and productivity.

Aluminium Industry

After Iron and steel industry, Aluminium industry is the second important industry of the country. Alumina is obtained by purifying the bauxite. Generally, in order to make 1 ton aluminium, 20- 24 thousand KW electric power, 5 tonnes bauxite, half a ton limestone, 0.3 ton petroleum and 0.13 ton caustic soda is required. This is the reason, that this industry is established near the coal fields and power plants. Aluminium is widely used in the manufacturing of domestic utensils, electric wires, building-construction, armament equipments, railway coaches, aeroplanes, cars, nuclear programmes and in furniture making.

Development of the Industry

In India, aluminium metal was first produced in 1886 by electronic method. The work of making utensils from imported aluminium started in 1929 in India.

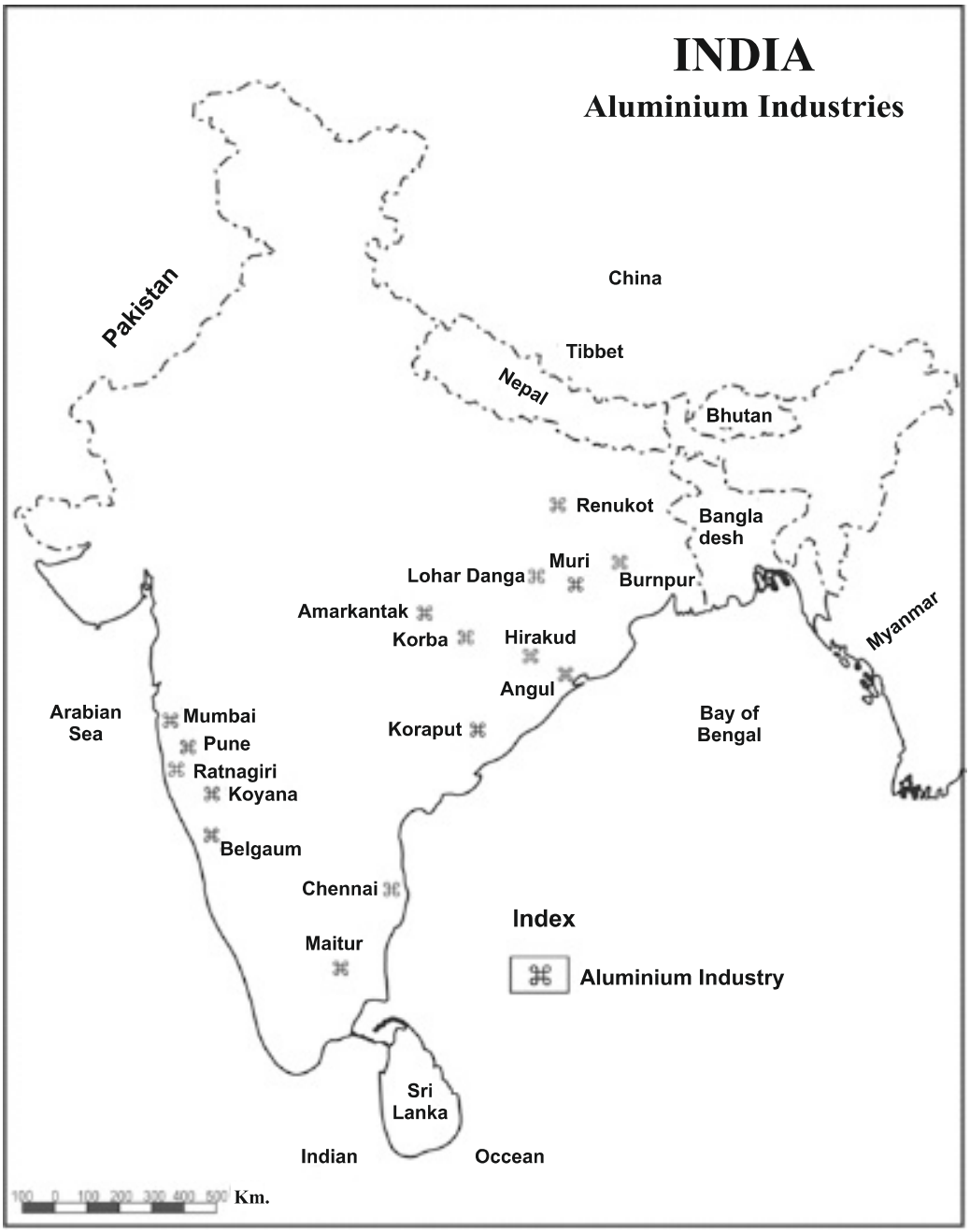
The prorper start of the aluminium industry in India took place in 1937 in JK Nagar (JK nagar in West Bengal), when a factory was established under the Aluminium Corporation of India. In 1941, The Indian Aluminium company started the work of making aluminium sheets from the imported aluminium masses. Currently, Hirakud INDAL, Renukoot HINDALCO, Uttar Pradesh and Madras Aluminium Company, (MALCO), Korba (Chhattisgarh), with an annual production capacity of 21 lac tonnes, the National Aluminium Company Limited (NALCO) is the largest aluminium producing plant of Asia .This plant is in Damanjodi, Orissa. The Vedanta Aluminium has also started the work since 2008.

Production and Trade

The production of aluminium in the year 2011-12 was 16.71 lac tonnes which increased to 3.96 million tonnes in 2014 - 15. India is the second largest producer and third largest consumer of aluminium in the world. India is the 5th largest country in terms of storage of bauxite.

Problems of the Industry

1. Competition in the international trade.
2. Unable to increase the exports
3. Centralisation of the sources of energy.
4. High cost of production.
5. In the recycle of aluminium 95% less energy is needed and causes less pollution.
6. Large domestic market.



Map 19.2 : India - Aluminium Industries

Localisation of the Industry

1. Indian Aluminium Company (INDAL) - The company manufactures aluminium masses and sheets made from indigenous bauxite. This factory is at a place called Moori in Jharkhand. Bauxite is obtained from the Lohardagga mines (32 km away from Moori), water and coal are obtained from the Damodar Valley. From here, aluminium is sent is to Allupuram (Kerala), Belgaum (Karnataka) and Thane (Maharashtra)

2. Bharat Aluminium Company Limited (BALCO)- A public sector undertaking the company is located at Korba (Chhattisgarh). Its capacity is 2 lac tonnes. Bauxite is obtained from

Fig. 19.1 : Aluminium Industry

Amarkantak (Madhya Pradesh) and electricity from the Korba thermal power plant. BALCO has established one of its plant at Ratnagiri in Maharashtra.

3. Hindustan Aluminium Corporation Limited (HINDALCO) - Its factory is located at Renukoot in Sonbhadra district. Here, bauxite is obtained from the districts of Ranchi and Palamau of Jharkhand, limestone from the Vindhyachal area and electric power from the Rihand Dam. The annual production capacity is 3.45 lac tonnes.

4. National Aluminium Company Limited (NALCO) - A public sector company was established in 1981, which is today the largest company of the country. In order to regularise the production, an additional unit has been set up at Angul (Odisha) in the thermal power-plant at the factory. Bauxite is obtained from Panch Patmali Hills (district Morapur) Odisha. Aluminium manufacturing factory is located at Damanjodi and alumina smelter is located at Dhenknal in Odisha.

Approximately 3.75 lac tonnes is sent to Europe and America from Visakhapattnam. With a total annual production of 21 lac tonnes, the National Aluminium Company limited has become the largest aluminium producing company of Asia.

Cement Industry :

Just like Iron and steel, cement is also a basic industry. The maximum use of which is done in the construction of buildings, roads, bridges, dams, factories, airports, etc. Its production and consumption is the indicator of the development of a country. India is the second largest producer of cement in the world after China.

Development of the Industry

The first attempt of making Cement in an organised way in India was done in Madras from sea-shells in 1904, which was unsuccessful. The real development took place in 1912-13, when Katni (MP by Khatau Company), Lakheri (Rajasthan), Bundi (by Click Nickson company) and Porbandar, Gujarat (by Tata sons) were established where production started in 1914.

By 1919, the no. of cement companies became 19, whose production capacity was 1 lac tonnes. The two world wars encourages the development of Indian cement industry. The associate cement

Table 19.1 : Progress of Cement Industry

Year	Installed Capacity (Lakh Ton)	Production (Lakh Ton)
1950–51	33	27
1970–71	180	143
1990–91	600	488
2000–01	2938	2097
2013–14	3245	2500
2014–15	3245	2700

company limited in 1934 and the Dalmia Cement group in 1937 promoted the cement production the most.

The total cement factories in the country were twenty three in 1947 out of which five went away to Pakistan due to partition and eighteen remained in India. Cement industry developed at a quicker pace after independence. In 1951, the total number of factories was twenty one. Six new factories were established in the first five year plan and their number increased to twenty seven in 1956. By 1960-61, the number raised to thirty four. By 1990-91, it was ninety two. With a constant increase in number by the end of March 2015, there were 209 big cement plants in the country with a production capacity of 37.83 crore tonnes. Along with this, the production of 365 smaller plants was 33.63 million tonnes. Indian cement can be compared with the best cement in the world.

Localisation of the Industry

In cement industry, there is much use of weight losing materials. On an average, in order to make 1 ton of cement, 1.6 tonnes limestone, 0.38 ton gypsum, and 3.8 tonnes of coal is needed. All these are heavy materials, keeping in view the means of transport the cement factories are established at the nearby areas of raw materials. Hence, the source of energy, raw material, coal, means of transportation are the main factors in the establishment of cement industry. The majority of cement industries are established on the basis of these factors.

Fig. 19.2 : Cement Warehouse

Distribution of Cement Industry

The localisation of cement industry in India has been in abundance in the limestone and coal - producing areas. There is an extension of limestone from Rajasthan to Vindhyachal, Bihar, Jharkhand. 74% of India's total production (86% of production capacity) comes from Gujarat, Rajasthan, Tamil Nadu, Bihar, Madhya Pradesh and Jharkhand.

Out of the bigger plants of cement, seventy seven plants are in Andhra Pradesh, Rajasthan and Tamilnadu. The top companies of cement industry produce more than 70% of the total output.

Tamilnadu - It is one of the top producer states of India. Sufficient raw materials are available here. Its plateau area is the major cement producing zone where Shankar Durg Dalmiapuram, Pulipur, Aayila Madurai, Alugang are the main cement producing centers

Madhya Pradesh - The state produces 12% of the total cement production of the country. The plant at Jamul is the biggest plant of the country. Satna, Mehar, Kesoon, Gopalnagar, Ankaltara, Banyor, Neemuch, Gwalior, Katni, Damoh are the major cement producing centers. The industry has developed at a quicker pace here due to the availability of superior quality of limestone, coal, power, transport and market.

Andhra Pradesh - The majority of cement factories of the state are located in the areas of Telangana Rayalseema. The concentration of factories is in the coastal areas. The major cement producing centres are Machhrela, Mangalgiri, Panyam, Krishna, Vijayawada, Tandoor, Mancherial, Yeraguntla, Bugnipali, Kistrina, Pedapalli, Nalconda, Hyderabad, Adilabad etc.

Rajasthan - One of the major producer states of the country. The development occured here rapidly due to availability of vast reserves of gypsum of the country, superior quality limestone, market, capital, means of communication. Lakheri, Nimbahera, Chittorgarh, Udaipur, Beawar etc. are the major centres.

Map 19.3 : India - Cement Industry

Gujarat - The maximum factories are in the coastal area. Sikka is the biggest cement plants of the state. Porbandar, Dwarika, Runwab, Okhamandal, Ahemedabad are the main cement producing centres.

Karnataka - In the state, cement factories have been developed in the hills of the western Ghats and the Karnataka plateau. Bagalcoat, Bari, Bhadrawati, Bangalore, Kurkanta, Shahbad, Aamsandra, Bijapur, Gulbarga and Tumkur are the major cement producing centres.

Jharkhand - Limestone and coal are available in abundance locally in Jharkhand. Son river valley is specially important for cement industry. Cement factories are at Sindri, Dalmianagar, Japla, Khalari, Chandubosa, Banjori Ka Pani and Kalyanpur.

Uttar Pradesh - It is a new producer state. The factories being new, their production capacity is high. Churk, chopan, chunar are the major producer districts.

Besides these, medium and small cement factories have been set up at Haryana (Surajpur, Charkhi-Dadari), Maharashtra (Chandrapura), Odisha (Hirakud, Rajagpura), Kerala (Kottayam), Jammu-Kashmir (Bruyan), Meghalaya (Cherapunji).

Problems of the Cement Industry

1. Large capital investment
2. Uncertainty of the availability of power and coal.
3. Constant lack of carriage wagons.
4. Lack of sufficient water, particularly in Rajasthan, Gujarat

Cotton Textile Industry

The tradition of cotton textile making is very ancient in India. When the developed countries of present day did not even know about cotton, superior quality of cotton textile was prepared in India. Herodotus came to India in 434 B.C and he wrote that Indians wore beautiful clothes made up of white coloured flowers. 5000 - 6000 years back from today, superior quality cloth was weaved which has been certified by the discoveries of Harappa and Mohenjodaro. In Egypt, the dead bodies have been found clad up in Indian silk in the pyramids around 2000 years B.C. In ancient Rome, the Roman ladies felt pride in wearing Indian silk and block printing clothes.

In reference to Indian cotton textile industry the French Traveller Tavernier who visited India during Mughal period wrote that "Indian Silk" was so beautiful that you had no knowledge whether it is in your hand. It was weaved with threads that were delicately woven. This piece of silk could be passed through a ring. This entire industry was done by only craftsman (artisans) at that time. The main centres of the industry were in between Nagapattnam and Dhaka on the eastern coast and Surat and Bharuch were the major centres on the western coast. Kalki cloth was prepared specially in Kalikut.

The rich class at Ahemedabad and Varanasi used gold and silver wired threads with cotton clothes. This cottage textile industry worked till 18th century, but the industrial revolution of Europe gave a major setback to the industry. The machine era paralysed this industry, along with it, the development of rail routes in India and the opening up of Suez routes between east-west was the final blow. Due to the above- mentioned reasons the honoured Indian textiles industries got lost in the womb of the past. Bukanan has expressed his view as, "For India, cotton industries has been an honour of the past, a crisis of the past and present and a hope forever."

Modern textile industry in India started in 1818 in Kolkata, Kavasji Dawar established a mill in Mumbai in 1854. By 1961, their number became twelve. By 1945 the number of these mills rose to 417. There was much development of the industry till independence. The partition of the country had an adverse effect on it.

But after independence, the industry had continuously developed. After agriculture, the maximum population works in cotton textile industry. It contributes to 14% of the industrial production, 4.0% of the Gross Domestic Product (GDP), 20% of total manufactured industrial production and 11% of the total exports. It is only 2 to 3% in import expenditure. This industry provides employment to approximately 4.5 crore people of the country.

The number of organised mills in textile industry is 1969, in which 1717 are weaving and 198 are composite mills. The per capita consumption of clothes in India was 43.1 sq metres per annum in 2009-10.

The localisation of cotton textile industry in India gets affected by the following factors :- (1)

Raw material (2) Means of Transport (3) Availability of Market (4) Moist and humid climate (5) Regular power supply (6) Adequate Skilled labour (7) Capital (8) Modern Technology

Table 19.2 : Production of Cotton Textile in India

S. No.	States	Percentage of Production	Production of Cotton Textile in India	
			Productive Year	Cotton Textile Crore Sq.m.
1	Maharashtra	38.39	1950–51	421.5
2	Gujarat	35.54	1960–61	637.8
3	Tamilnadu	6.40	1970–71	759.6
4	Punjab	5.53	1980–81	836.8
5	Madhya Pradesh	4.70	1990–91	2292.8
6	Uttar Pradesh	3.20	2000–01	4023.3
7	Rajasthan	2.8.	2007–08	5606.05
8	Puducherry	2.45	2008–09	5496.6
9	Karnataka	0.32	2011–12	3057.0
10	Kerala	0.67	2012–13	6195.0
	Total	100.0	2013–14	4738.0

Distribution of Cotton Textile Industry

In the initial stages, cotton textile industry was established only in the cotton producing areas, but today it is the most decentralised industry. Presently, the maximum factories are located in the Ganges plains and the southern peninsular region. The state wise distribution of cotton textile industry in the country is as follows -

Maharashtra - It stands at the first place from the point of view of cotton textile production in India, where 181 mills are in operation. Mumbai is the most important centre. The first mill of the country was established here. There are fifty seven cotton textile mills in Mumbai itself. That is why, Mumbai is called the cotton textile capital of India. Others centres are Sholapur, Akola, Amrawati, Pune, Satara, Kolhapur, Sangli, Aurangabad, Jalgaon, Nagpur etc. where approximately 30 lac Labourers work in this industry.

The major factors responsible for the development of industry here are (1) Moist sea-climate (2) Cotton producing areas (3) Adequate supply of hydro-electric power from Tata power production centre, (4) Facility of import-export from the port. (5) Local market (6) Facility of transport. Inspite of all this, the textile industry is transferring from Mumbai owing to establishment of petroleum industry, high cost of land and labour being more expensive.

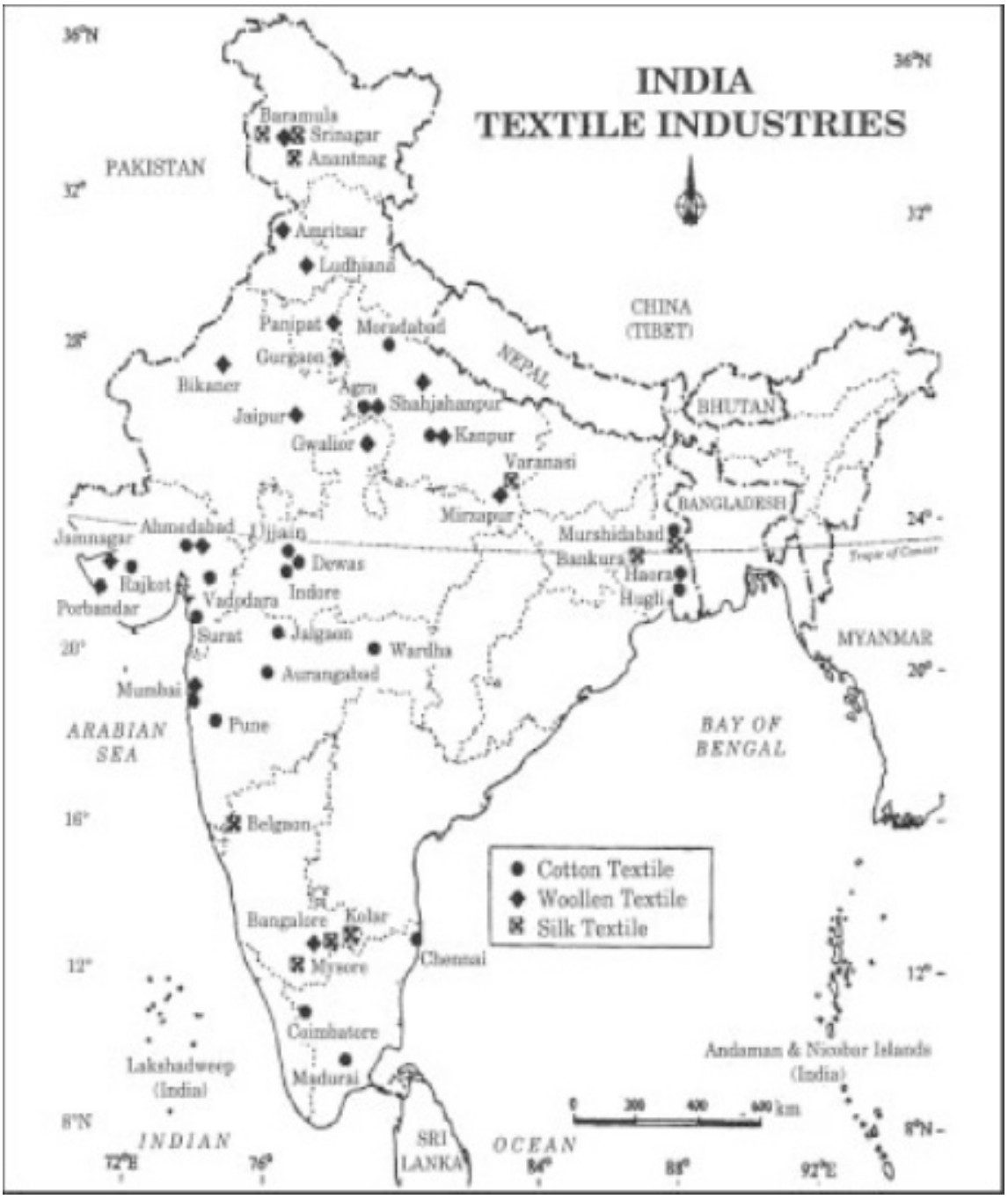
Gujarat - Gujarat is the second biggest cotton textile producing state in India where 135 Mills are in operation. Out of which, 65 mills are in Ahmedabad alone. Ahmedabad is called the "Boston of East". Facilities like in Mumbai are available in Gujarat. Superior and fine thin cloth is manufactured at Ahmedabad. Surat, Baroda, Ahmedabad, Himmatnagar are the major centres.

Tamilnadu - Despite not being a cotton producing state, there are a large number of cotton mills here. These mills are smaller in size than the Mills in Gujarat and Maharashtra.

The most important centre is Coimbatore, where half of the state mills are located. Madurai, Salem, Chennai, Tiruchirappalli, Ramnathapuram, Tuticorin are the other major centres. The leading factors behind the development of cotton textile industry here are adequate and cheap hydro-electricity, cheap labour, facility of port, humid climate, new cotton producing areas etc.

West Bengal - In West Bengal, there are sufficient textile mills around Kolkata, 24 pargana, Howrah and Hugli districts. Reasons for development are (1) Kolkata port and nearness to South-Eastern Asian countries (2) Import facility (machine and superior cotton) (3) Availability of coal from Raniganj and Jharia (4) Advanced transport system (5) Capital and other trade facilities available in Kolkata (6) Moist and humid climate (7) Vast local market (8) The non-development of the industry in North-eastern states.

Uttar Pradesh - There are thirty six cotton textile mills in the state, which are dependent on imported cotton. Kanpur is the main centre of the state, with ten mills. Kanpur is called the



Map 19.4 : India - Textile Industry

"Manchester of northern India". Moradabad, Modinagar, Saharanpur, Aligarh, Agra, Hathras, Itawa, Bareiely etc. are the major centres

Karnataka - There are cotton textile producing areas nearby Bengaluru in which Bengaluru, Chhundli, Bellari, Belgaum, Gulbarga are the major centres.

Andhra Pradesh - Andhra Pradesh is a new upcoming state. The cotton textile industry of the state is dependent on the Cotton of Telangana. Hyderabad, Warangal, Guntoor, Godavari, Secunderabad are the major producing centres.

Rajasthan- There are cotton textile mills at Bhilwara, Banswara, Udaipur, Beawar, Pali. The other Cotton textile producing states - Punjab (Amritsar, Ludhiana), Kerala (Thiruvanthapuram, Alwaye), Bihar (Patna, Munger, Bhagalpur, Gaya) etc are the major producing areas.

The production of cotton textile is regularly increasing. At the same time superior quality cloth is being manufactured at the new mills and after fulfilling the domestic use, it is begin exported to more than 50 countries of the world.

Sugar Industry

In India, Sugar is manufactured from sugarcane. Sugar industry stands second after cotton. Textile industry is among agro based industries. Sugar industry has developed in India 3000 years B.C. in the form of cottage industry. The art of making gur, khandsari from sugarcane by the people of India has been described in detail in the vedic literature, Arthashastra by Kautilya and 'Indica' by Megasthenes. But its development as a large scale industry started in the 20th century. Before it, efforts were also made in 1841-42 and 1899 but they were unsuccessful. The first successful sugar mill was established by the britishers in 1903 at Madore (District- Saran) in Bihar. Thereafter, many sugar mills were also established in Uttar Pradesh adjacent to Bihar. Approximately thirty five sugar mills were established till 1932. There were 138 sugar mills in India in 1951, with a production capacity of 15 lac Tonnes. There were seventy sugar mills established in India till 31st August 2014, out of which 334 are in private sector, forty three in public sector and 324 are in co-operative sector.

Table 19.3 : Sugar Production in India

Productive Year	1960 –61	1970 –71	1900 –91	2009 –10	2010 –11	2011 –12	2012 –13	2013 –14
Production (In lac ton)	30. 20	37. 40	120. 46	188. 03	243. 49	263. 43	251. 83	243. 25

Localisation of Sugar Industry

Sugar industry is a weight losing industry. 9 to 12 kgs sugar is obtained from 100 kgs. of sugarcane. In the production cost of sugar, 60% expense is on sugarcane. The transportation of sugarcane is difficult in comparison to sugar. The crushing of sugarcane should be done within 24 hours of cutting. The delay in crushing reduces the quantity of sucrose. Hence, sugar mills are bound to be established in the sugarcane producing areas.

Distribution of the Sugar Industry

90% of the sugar in India is prepared in Uttar Pradesh, Maharashtra, Bihar, Andhra Pradesh, Tamil Nadu and Karnataka.

Uttar Pradesh - It has the maximum sugarcane area and in the number of mills also the state stood first, but in 2015-16, it has come to the second place in sugar production and mills.

There is a competition between Uttar Pradesh and Maharashtra in sugar production. The Ganga-Yamuna Doab and the Terai area are the important sugar producing areas in Uttar Pradesh. At least one sugar mill is located near each railway station from Saharanpur to Ghaziabad.

Maharashtra - Maharashtra occupies the first place in sugar production in the country in 2015-16. This year 105.1 lac tonnes sugar was produced which was approximately 41.87% of the country's total sugar production. The biggest centre of the state is Ahmednagar which has 11 mills. Presently there are 134 sugar mills in Maharashtra, which is the maximum in the country.

Andhra Pradesh - The main sugar production areas are to the East and West of Godavari : the districts of Krishna, Visakhapatnam and Nizamabad. There has been a considerable increase in the production of sugar.

Karnataka - Here, there are eleven sugar mills out of which three are co-operative mills,three mills are located in Belgaon and two mills in Raichur.

Map 19.4 : India - Sugar Industry

Bihar - Northern Bihar is the main sugar producer where Champaran, Saran, Darbhanga, Patna etc. are the main producing districts.

Tamilnadu - All the mills are in Coimbatore, North and south Arcot, Tiruchirappalli, Ramnathapuram. The sugarcane produced here is comparatively sweeter than others due to the influence of the coastal winds.

Rajasthan - Keshoraipatan (Bundi), Sriganganagar

Punjab - There are Sugar mills at Navashahar, Dhoori, Hoshiarpur, Gurdaspur, Amritsar.

Haryana- There are sugar mills at

Fig. 19.3 : Sugar Cane for Sugar Industry

Yamunanagar, Panipat, Rohtak, Sonipat Palwal, etc.

Gujrat- Ahmadabad and Bhavnagar are the main centres of sugar industry in Gujarat.

West Bengal - Sugar mills are located at Beldog, Murshidabad, Plali (rivers) Bashirhat (24 Pargana) and Howrah.

During the past few decades, sugar industry is shifting to the south India.

Problem and Suggestion

Suggestion for the Progress of Sugar Industries

Sugar industry has its own several problems, but still the production may be increased.

1. Arrangement should be made for proper supervision.
2. There should be arrangements for new machine in place of the older ones.
3. Establishment of mills in the sugarcane producing area should be made a compulsion.
4. Special stress on research work should be laid on the crop of sugarcane .
5. In addition to the quantity of sugarcane, quality (juice) should also be considered in the estimation of cost.
6. Arrangements should be made for the employment of the workers so that they may remain employed all- year round.
7. The residual produce should also be fully used.
8. Reforms should be made in the tax-system.
9. The cost of sugarcane should be paid to the farmer at the time of sale.

Engineering Industry

Engineering industry occupies an important place in the industrialization of a country. The secret behind the progress of the various developed nations in the world is the development of their engineering industry. Experts say that even a single wheel of machines cannot be moved without the development of engineering industry. Under this industry, several types of mixed metals, capital goods, various machinery, mechanical tools, etc are manufactured. This industry requires large capital, transport facility, cheap electric power, cheap labour and experience of technical knowledge.

Heavy Engineering Industry

Heavy engineering industry was established in the country by Heavy Engineering Corporation Limited (HTC) in 1957 at Ranchi with the assistance of Russia and Czechoslovakia. Its production was 0.3 Crore rupees in the first five year plan which increased to 5164 crore rupees in 2008-09.

Infrastructure

Basic construction industry is an important industry. Under it, structures of steel plants, Railway Bridge and hydraulic gate are included. There are 250 factories under it, whose total production capacity is 6 lac Tonnes. Drills are made in Nano (Allahabad, 1965), Tungabhadra (Karnataka 1747),

Bharat Heavy plates and vessels Limited. Visakhapattnam (Andhra Pradesh) Larson and Tubro Limited, Powai, Mumbai and Naroda (Ahmadabad).

Industrial Machinery

In India various kinds of machinery are made for paper, cement, chemical, tea, cotton textile, jute textiles, coal mining etc. industries. India is self reliant in the manufacturing of industrial machinery. It is also exported to some African and Asian countries.

Fig. 19.4 : Engineering Industry

Textile making machines

In the country, there are 210 units running to make the machinery of the textile industry, which manufacture different types of the textile industry machinery. Ring frame, Fly frame, Speed frame, Bleaching Plant etc. are made in these units. Mumbai, Kolkata, Bangalore, Coimbatore, are the main centres.

Machine tools

The sheets of iron and steel are used as a raw material in various other industries. The other things which are made from it are called machine tools. Two hundred units are in operation of this type. Hindustan machine tools was established in 1953 with the assistance of Switzerland, which has nine plants. They all are public sector enterprises. The main Centre is at Bangalore and other units are at Pinjore, Kalamassery, Hyderabad, Srinagar under which machine tools, watches and tractors are manufactured. Ajmer, Kota, Secunderabad etc. are the public sector enterprises of HMT.

Heavy Electric Engineering

The Bharat Heavy Electricals Limited (BHEL) was established in the public sector in 1964 to manufacture the electric equipments in the country. Its plants are located at Bhopal, Hyderabad, Haridwar, Ranipet. Bengaluru and Jamshedpur.

Motor Vehicles Industry

The automobile industry of the country is called the 'Sunrise Sector'. The Hindustan Motor Company started the work at Uttarpara of Kolkata in 1944. The Premier Automobiles Limited, Kurla, Mumbai was established in 1947. Presently, there are 35 units working in the country, out of which maximum twelve are in Maharashtra, six in Tamilnadu and five in Delhi.

Passenger car and other multi utility vehicles

The first car was manufactured by the Maruti Udyog Limited (Gurgaon) with the technical assistance of Suzuki of Japan in 1983. The Present capacity is four lac vehicles per year. The Premium Automobiles at Mumbai, Standard Motor products at Chennai, Hyundai Motors India Limited at Chennai, Mahindra and Mahindra Company Limited at Pune and Tata Locomotive Works are at Jamshedpur. They are also being exported from the country.

Cycle Industry

India is the second largest producer of cycles in the world after China. The industry started in 1938. Presently, Ludhiana is the major cycle manufacturing centre in India.

Locomotive Industry

With the development of railways, the railway department established the locomotive Workshop at Ajmer (Rajasthan) and Jamalpur (Bihar) and started the work of making rail engines. Till 1940, 446 engines and 346 boilers were made by the Ajmer workshop. Both have been closed now. Presently, two main units are important, the Chitranjan

Locomotive Works in 1950 (West Bengal). Electric engines are manufactured here and Diesel locomotive works, Varanasi has a capacity of 161 engines per year. It was established with the assistance of American company Elfo. Diesel engines are manufactured here. The Diesel component works was established at Patiala by the Indian Railways for the manufacture and repair of Diesel Engines.

Rail Coaches Manufacturing Factories

The rail coaches manufacturing workshop in the public sector is at the Integral Coach Factory, Peramboor (Tamilnadu). 25138 passenger coaches were manufactured between 1975-1998. General and Air Conditioned passenger coaches are manufactured here.

The rail coach Factory at Kapurthala, (Punjab), Ms. Pressops (Kolkata), Bharat Earth Movers Limited Bengaluru also manufacture coaches and other accessories. A wheel and axle plant has been established at Bengaluru.

Ship making Industry

The first technically advanced shipping factory in India was Scindia Steam Navigation Company established in 1941 at Visakhapatnam.. The first ship built here was named 'Usha'. The plant was nationalised in 1952 and it was named Hindustan Shipyard Limited, Visakhapatnam. Here 107 ships have been built till now.

Garden Reach Workshop - It is on the banks of the river Hughli, where 15000-25000 tonnes weight capacity ships are built.

Goa Shipyard- Both repairing and manufacturing of ships is done here.

Majhgaon Dockyard Mumbai- Here, figet type of ships of the Indian Navy are manufactured.

Cochin Shipyard Limited - The biggest Shipyard of the country was built in 1965, with 165 crore rupees with the assistance of Japan. Here, repairing, manufacturing and training work is done.

Aircraft manufacturing Industry

The first attempt for aircraft manufacturing in India was made in 1940 at Bengaluru in Hindustan Aircraft Limited. The Hindustan Aeronautics Limited was established in 1964 at Bengaluru. It has its units at Bengaluru, Kanpur, Nashik, Koraput, Hyderabad and Korwa (Lucknow).

Information Technology

Electronics communication and computers are included under it. Bengaluru is the major centre of Information Technology industry and it is known as the 'Silicon Valley of India'.

Electronic Industry

The Indian telephone industry was established at Bengaluru in 1950. It has its units at Srinagar, Raibareili, Naini (Allahabad). The Bharat Electronics Limited was established at Bengaluru. It manufacturers electronic instruments related to military, meteorological science and radio. The Hindustan cables manufactures telephone wires.

The total export of engineering goods from India in 1970-71 was of 198 crore rupees which increased to 4,33,868 crore rupees in 2014-15.

Problems of the Industry

There is a rapid progress of the engineering industry but it faces some problems also-

1. **Shortage of raw material :** The steel used in making the parts is manufactured less in the country. Hence, it has to be imported.
2. **Lack of capital :** This industry requires huge capital but unfortunately, there is dearth of it in country and for this reason, plants have been established in the public sector.
3. **Excessive tax rates** : There is a difficulty in export due to the heavy tax levied on the products of this industry.
4. **Other problems :** Foreign competition, less utilization of the production capacity and lack of quality control are other problems.

Future of the Industry

This industry has a bright future. We are exporting engineering goods to countries like America, China, Britain, Russia etc. which is constantly increasing. The demand is also increasing at the local level in the country.

Table 19.5 : Annual Growth Rate of Major Areas of Industry

base 2004–05 = 100

Duration	Minning	Manufecturing	Electricity	General
	14.16	75.53	10.32	100
	2.60	2.50	2.70	2.50
	7.90	4.80	6.10	5.30
	5.20	9.00	5.50	8.20
	–2.00	3.00	8.20	2.90
	–2.30	1.30	4.00	1.10
	–0.80	–0.80	6.10	–0.10
	1.40	2.30	8.40	2.80
	2.10	2.50	4.70	2.70

Make in India Programme

In order to increase the pace of industrial development by increasing the investment and to make the country a 'Manufacturing Hub' "Make in India Program" was formally started on 25th September, 2014.

IMPORTANT POINTS

1. There has been industrial development in India since ancient times. Approximately 5000-8000 years back in Harappa and Mohenjodaro, small units worked to manufacture garments and several other goods.
2. The exact development of the Cotton Textile Industry took place in 1854, at Mumbai. It is the second largest employment providing sector after agriculture. The main centres are Ahmedabad and Mumbai.
3. Main cotton textile producting states are Maharashtra, Gujarat, Tamilnadu, Punjab, Madhya Pradesh, Uttar Pradesh, Rajasthan etc.
4. Cement Industry is a fast growing industry in India. There are 209 big plants with a production capacity of 37.83 crore tonnes. India is the second largest producer of cement in the world .
5. Main cement producing states are Tamilnadu, Madhya Pradesh, Andhra Pradesh, Rajasthan, Gujarat, Karnataka, Jharkhand etc.
6. Sugar Industry is an agro-based industry which developed 3000 years B.C. in the form of the cottage industry. It is a weight losing industry and tendency is of shifting to the south India from the North India.
7. Major Sugar producing states are Maharashtra, Uttar Pradesh, Bihar, Andhra Pradesh, Tamil Nadu, Karnataka etc.
8. Iron and steel industry is the basic industry, weight losing industry, main units are Tata Iron and Steel Company, Indian Iron and Steel plant, Vishveshwaraiyya iron and Steel Company Ltd. Rourkela, Bhilai, Durgapur steel centres, Bokaro steel plant etc.
9. Aluminium Industry started in 1886, The total production was 3.96 million tonnes in 2014-15. The main production units are the Indian Aluminium Company, Bharat Aluminium Company Limited, Hindustan Aluminium Corporation Limited etc.
10. Engineering Industry is the most important industry. The major problems are lack of raw material, lack of capital, excessive taxation, foreign competition, incomplete utilization of the production capacity and lack of quality Control.
11. The "Make in India Programme" was started on 25th September 2014, with the main objective to trigger country's industrial development.

EXERCISE

Multiple Choice Type Questions

1. The biggest sugar producing state in India is -
   (a) Uttar Pradesh (b) Bihar
   (c) Maharashtra (d) Tamilnadu
2. The latest railway coach factory has been established at -
   (a) Banaras (b) Raibareili
   (c) Kapurthala (d) Perambur
3. Which raw material is most influential for the establishment of cement industry ?
   (a) Limestone (b) Manganese
   (c) Gypsum (d) None of these
4. The iron steel industry at Bokaro has been established with the co-operation of -
   (a) United States of America
   (b) Former Soviet Union
   (c) Britain (d) Germany
5. Tata Iron and Steel Plant receives iron- ore from-
   (a) Beladiya (b) Mayurbhanj
   (c) Singhbhum (d) Bonai
6. The industry started firstly in India-
   (a) Textile Industy (b) Iron Industry
   (c) Jute Industry (d) Marble Industry
7. The industry in India which is centralized mostly near the source of raw material is-
   (a) Iron steel (b) Woolen Textile
   (c) Sugar (d) Cotton Textile
8. The Iron steel Industry Centre located near coal fields is-
   (a) Bhadrawati (b) Bokaro
   (c) Jamshedpur (d) Visakhapatnam
9. The maximum number of cotton textile plants are in -
   (a) Maharashtra (b) Gujarat
   (c) Tamilnadu (d) Madhya Pradesh
10. The centre of heavy engineering industry is -
    (a) Ranchi (b) Bengaluru
    (c) Hyderabad (d) Pune
11. Cement industry is most developed in -
    (a) Madhya Pradesh (b) Rajasthan
    (c) Gujarat (d) Karnataka

Very Short Answer Type Questions

12. Jharia is famous for which mineral ?
13. Lakheri is located in which state ?
14. Write the full form of TISCO.
15. In which state of India is the Iron Pillar located ?
16. When and where was cement making from Sea-shells started for the first time in India ?

Short Answer Type Questions

17. Write any three problems of the engineering industry.
18. Raw material acts as a magnet for industries Comment.
19. Write the names of major centres of the aircraft manufacturing.
20. Clarify the characteristics of the Visakhapattnam iron and steel plant.
21. Briefly mention the factors responsible for the development of cement industry in Rajasthan.
22. Sugar industry is shifting to South India from North India. Explain with reasons.

Essay Type Questions

23. Write a brief account of the development of cotton textile industry in India. Why this industry is more centralized in Maharashtra and Gujarat ?
24. Describe the distribution of Iron and steel industry and explain the factors for its localisation.
25. Describe in detail the Aluminium industry in India.