**India-People and Economy**

**Chapter-8 Manufacturing Industries**

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**Key Notes:**

- Industries have become very important part of an economy
- They provide employment to large labour force and contribute significantly in the total national wealth/income

**Types of Industries**

- Industries are classified on the basis of size, capital investment and labour force employed
- Industries are also classified as large, medium, small scale, and cottage industries
- On the basis of ownership, industries are categorised as : (i) public sector, (ii) private sector, and (iii) joint and cooperative sector
- Industries are also classified on the basis of the use of their products such as : (i) basic goods industries, (ii) capital goods industries (iii) intermediate goods industries, and (iv) consumer goods industries
- Industries are classified on the basis of raw materials (i) agriculture-based industries, (ii) forest-based industries, (iii) mineral-based industries, and (iv) industrially processed raw materialbased industries
- Another common classification of industries is based on the nature of the manufactured products. Eight classes of industries, thus identified are :
    - Metallurgical Industries,
    - Mechanical Engineering Industries,
    - Chemical and Allied Industries,
    - Textile Industries,
    - Food Processing Industries,
    - Electricity Generation,
    - Electronics and

- Communication Industries

**Location of Industries**

Location of industries is influenced by several factors like access to raw materials, power, market, capital, transport and labour, etc

**1) Raw materials**

- There is strong relationship between raw material and type of industry
- Industries using weight-losing raw materials are located in the regions where raw materials are located
- For example, the locations of pulp industry, copper smelting and pig iron industries are located near their raw materials
- In iron and steel industries, iron ore and coal both are weight-losing raw materials. Therefore, an optimum location for iron and steel industries should be near raw material sources
- This is why most of the iron and steel industries are located either near coalfields of Bokaro, Durgapur, etc. or near sources of iron ore i.e Bhadravati, Bhilai, and Rourkela
- Industries based on perishable raw materials are also located close to raw material sources

**2) Power**

- Regular supply of power is a pre-requisite for the localisation of industries. Coal, mineral oil and hydro-electricity are the three important conventional sources of power. Most of the industries tend to concentrate at the source of power
- Power provides the motive force for machines, and therefore, its supply has to be ensured before the location of any industry
- For example, industries, like aluminium and synthetic nitrogen manufacturing industries tend to be located near sources of power because they are power intensive and require huge quantum of electricity

**3) Market**

- Markets provide the outlets for manufactured products
- Heavy machine, machine tools, heavy chemicals are located near the high demand

areas as these are market orientated

- Nearness to market is essential for quick disposal of manufactured goods
- It helps in reducing the transport cost and enables the consumer to get things at cheaper rates
- For example, cotton textile industry uses a non-weight-losing raw material and is generally located in large urban centre, e.g. Mumbai, Ahmedabad, Surat, etc
- Another example, petroleum refineries are also located near the markets as the transport of crude oil is easier and several products derived from them are used as raw material in other industries e.g. Koyali, Mathura and Barauni refineries

**4) Transport**

- Transport by land or water is necessary for the assembly of raw materials and for the marketing of the finished products
- The development of railways in India, connecting the port towns with hinterland determined the location of many industries around Kolkata, Mumbai and Chennai
- All major industrial plants are located on the trunk rail routes

**5) Labour**

- Labour supply is important in two respects (a) workers in large numbers are often required; (b) people with skill or technical expertise are needed
- In our country, modem industry still requires a large number of workers in spite of increasing mechanisation
- For example, the light consumer goods and agro-based industries generally require a plentiful of labour supply
- In India, labour is quite mobile and is available in large numbers due to our large population

**6) Historical factors**

- Industrial location like Mumbai, Kolkata and Chennai were greatly influenced by our colonial past
- Places like Murshidabad, Dhaka, Bhadohi, Surat, Vadodara, Kozhikode, Coimbatore, Mysore, etc. emerged as important manufacturing centres

**7) Industrial policy**

- Industrial policy is a statement which defines the role of government in industrial development
- The industrial policy of the Government of India is aimed at increasing the tempo of industrial development
- It seeks to create a favourable investment climate for the private sector as well as mobilise resources for the investment in public sector
- For example, establishment of iron and steel industry in Bhilai and Rourkela were based on decision to develop backward tribal areas of the country
- Government of India provides lots of incentives to industries locating in backward areas

**The Iron and Steel industry**

- The iron and steel industry is basic to the industrial development of any country
- Almost all sectors of the Indian industry depend heavily on the iron and steel industry for their basic infrastructure
- The best location for the iron and steel plants is near the source of raw materials
- Raw materials used in iron and steel industry are coking coal, limestone, dolomite, manganese and fire clay
- In India, there is a crescent shaped region comprising parts of Chhattisgarh, Northern Orissa, Jharkhand and western West Bengal, which is extremely rich in high grade iron ore, good quality coking coal and other supplementing raw materials

The Indian iron and steel industry consists of large integrated steel plants as well as mini steel mills. These are

**1) TISCO**

- The Tata Iron and Steel plant lies very close to the Mumbai-Kolkata railway line and about 240 km away from Kolkata, which is the nearest port for the export of steel
- The rivers Subarnarekha and Kharkai provide water to the plant
- The iron ore for the plant is obtained from Noamundi and Badam Pahar and coal is brought from Joda mines in Orissa
- Coking coal comes from Jharia and west Bokaro coalfields

**2) IISCO**

- The Indian Iron and Steel Company (IISCO) set up its first factory at Hirapur and later on another at Kulti
- In 1937, the Steel corporation of Bengal was constituted in association with IISCO and set up another iron and steel producing unit at Burnpur (West Bengal)
- The three plants under IISCO are located very close to Damodar valley coal fields (Raniganj, Jharia, and Ramgarh)
- Iron ore comes from Singhbhum in Jharkhand. Water is obtained from the Barakar River, a tributary of the Damodar
- All the plants are located along the Kolkata-Asansol railway line
- The steel production from IISCO fell considerably in 1972-73 and the plants were taken over by the government

**3) Visvesvaraiya Iron and Steel works Ltd.**

- The third integrated steel plant, the Visvesvaraiya Iron and Steel Works, initially called the Mysore Iron and Steel Works
- It is located close to an iron ore producing area of Kemangundi in the Bababudan hills
- Limestone and manganese are also locally available
- Electric furnaces were installed which use hydroelectricity from the Jog Falls hydel power project
- The Bhadravati river supplies water to the plant
- After independence, during the Second Five Year Plan (1956-61), three new integrated steel plants were set up with foreign collaboration: Rourkela in Orissa, Bhilai in Chhattisgarh and Durgapur in West Bengal
- In 1973, the Steel Authority of India Limited (SAIL) was created to manage these plants

**4) Rourkela Steel Plant**

- The Rourkela Steel plant was set up in 1959 in the Sundargarh district of Orissa in collaboration with Germany
- The plant was located on the basis of proximity to raw materials, thus, minimising the cost of transporting weight losing raw material

- This plant has a unique locational advantage, as it receives coal from Jharia (Jharkhand) and iron ore from Sundargarh and Kendujhar
- The Hirakud project supplies power for the electric furnaces and water is obtained from the Koel and Sankh rivers

**5) Bhilai Steel Plant**

- The Bhilai Steel Plant was established with Russian collaboration in Durg District of Chhattisgarh and started production in 1959
- The iron ore comes from Dalli-Rajhara mine , coal comes from Korba and Kargali coal fields
- The water comes from the Tanduladam and the power from the Korba Themal Power Station
- This plant also lies on the Kolkata-Mumbai railway route
- The bulk of the steel produced goes to the Hindustan Shipyard at Vishakhapatnam

**6) Durgapur Steel Plant**

- Durgapur Steel Plant, in West Bengal, was set up in collaboration with the government of the United Kingdom and started production in 1962
- This plant lies in Raniganj and Jharia coal belt and gets iron ore from Noamundi
- Durgapur lies on the main Kolkata-Delhi railway route
- Hydel power and water is obtained from the Damodar Valley Corporation (DVC)

**7) Bokaro Steel Plant**

- This steel plant was set up in 1964 at Bokaro with Russian collaboration
- This plant was set up on the principle of transportation cost minimisation by creating Bokaro-Rourkela combine
- It receives iron ore from the Rourkela region and the wagons on return take coal to Rourkela
- Other raw materials come to Bokaro from within a radius of about 350 km
- Water and Hydel power is supplied by the Damodar Valley Corporation

**8) Other Steel Plants**

- New steel plants which were set up in the Fourth Plan period are located in South

India

- The Vizag Steel Plant, in Vishakhapatnam in Andhra Pradesh is the first port based plant which started operating in 1992
- The Vijaynagar Steel Plant at Hospet in Karnataka was developed using indigenous technology. This uses local iron ore and limestone
- The Salem Steel Plant in Tamil Nadu was commissioned in 1982

**The Cotton Textile Industry**

- The cotton textile industry is one of the traditional industries of India
- India was famous worldwide for the production of muslin, a very fine variety of cotton cloth, calicos, chintz and other different varieties of fine cotton cloth

The development of this industry in India was due to several factors

i. It is a tropical country and cotton is the most comfortable fabric for a hot and humid climate
ii. Large quantity of cotton was grown in India
iii. Abundant skilled labour required for this industry was available in this country

In 1854, the first modern cotton mill was established in Mumbai. Mumbai had several advantages as a cotton textile manufacturing center. These are-

a. It was very close to the cotton producing areas of Gujarat and other parts of Maharashtra
b. Raw cotton used to be brought to Mumbai port to be transported to England
c. Mumbai even then was the financial centre and the capital needed to start an industry was available there
d. As a large town, providing employment opportunities attracted labour in large numbers. Hence, cheap and abundant labour too was available locally
e. The machinery required for a cotton textile mill could be directly imported from England

In 1998, India had 1782 mills; of which, 192 mills were in the public sector and 151 mills in the cooperative sector. The largest number, that is, 1,439 mills were in the private sector. The cotton textile industry in India can be broadly divided into two sectors, the organised sector and the decentralised sector

i. The decentralised sector includes cloth produced in handlooms (including Khadi) and

powerlooms. The production of the organised sector has drastically fallen from 81% in the mid-20th century to only about 6% in 2000

ii. The powerlooms on the decentralised sector produce more than 59% and the handloom sector produces about 19 % of all cotton cloth produced in the country

- After the first mills were set up in Mumbai and Ahmedabad in the second half of the 19th century
- In southern India, mills were set up at Coimbatore, Madurai and Bangalore.
- In central India, Nagpur, Indore, Solapur and Vadodara became cotton textile centres
- Cotton textile mills were set up at Kanpur based on local investment. Mills were also set up at Kolkata due to its port facilities
- The rapid development of this industry in Tamil Nadu is the result of the abundant availability of hydel power for the mills
- Reason behind the location of the cotton textile mills away from the cotton producing areas are the development of hydro-electricity and lower labour costs at centres like Ujjain, Bharuch, Agra, Hathras, Coimbatore and Tirunelveli
- The major centres of the cotton textile industry are Ahmedabad, Bhiwandi, Solapur, Kolhapur, Nagpur, Indore and Ujjain, all these centres are the traditional centres and are located close to the cotton producing regions
- Maharashtra, Gujarat and Tamil Nadu are the leading cotton producing states
- West Bengal, Uttar Pradesh, Karnataka, and Punjab are the other important cotton textile producers

**Southern Region**

- Tamil Nadu has the largest number of mills and most of them produce yarn rather than clot
- Coimbatore has emerged as the most important centre with nearly half the mills located there
- Chennai, Madurai, Tirunelveli, Tuticorin, Thanjavur, Ramanathapuram and Salem are the other important centres
- In Karnataka, the cotton textile industry has developed in the cotton producing areas in the north-eastern part of the state
- Davangere, Hubli, Bellary, Mysore and Bangalore are important centres
- In Andhra Pradesh, the cotton textile industry is located in the cotton producing

Telengana region, where most of the mills are spinning mills producing yarn
- The important centres are Hyderabad Secunderabad, Warangal and Guntur

**Northern Region**

- In Uttar Pradesh, Kanpur is the largest centre
- Some of the other important centres are Modinagar, Hathras, Saharanpur, Agra and Lucknow
- In West Bengal, the cotton mills are located in the Hugli region
- Howrah, Serampur, Kolkata and Shyamnagar are the important centres

**Sugar Industry**

- The sugar industry is the second most important agro-based industry in the country
- India is the largest producer of both sugarcane and cane sugar and contributes about 8% of the total sugar production in the world
- This industry provides employment for more than 4 lakh persons directly and a large number of farmers indirectly
- Sugar industry is a seasonal industry because of the seasonality of raw materials

**Location of sugar industry**

i. Sugar cane is the main raw material for the sugar industry
ii. It is a heavy, low value, weight losing and perishable raw material

- Maharashtra has emerged as a leading sugar producer in the country and produces more than one-third of the total production of the sugar in the country
- There are 119 sugarmills in the state in a narrow belt extending from Manmad in the north to Kolhapur in the south
- There are 87 mills in the cooperative sector

**Distribution of sugar industry**
**Northern Region**

- Uttar Pradesh is the second largest producer of sugar
- The sugar factories are concentrated in two belts – the Ganga-Yamuna doab and the tarai region

- The major sugar producing centres in the Ganga -Yamuna doab are Saharanpur, Muzaffarnagar, Meerut, Ghaziabad, Baghpat and Bulandshahr districts; while Kheri Lakhimpur, Basti, Gonda, Gorakhpur, Bahraich are important sugar producing districts in the Tarai region

**Southern Region**

- In Tamil Nadu, sugar factories are located in Coimbatore, Vellore, Tiruvanamalai, Villupuram and Tiruchchirappalli districts
- Belgaum, Bellary, Mandya, Shimoga, Bijapur, and Chitradurg districts are the major producers in Karnataka
- The industry is distributed in the coastal regions i.e. East Godavari, West Godavari, Vishakhapatnam districts and Nizamabad, and Medak districts of Telangana alongwith Chittoor district of Rayalseema

**Other states**

- The other States which produce sugar are Bihar, Punjab, Haryana, Madhya Pradesh and Gujarat
- Saran, Champaran, Muzaffarnagar, Siwan, Darbhanga, and Gaya are the important sugarcane producing districts in Bihar
- In Haryana, sugar factories are located in Yamuna Nagar, Rohtak, Hissar and Faridabad districts
- Sugar mills are located in the cane growing tracts of Surat, Junagarh, Rajkot, Amreli, Valsad and Bhavnagar districts

**Petrochemical Industries**

- A variety of products come under this category of industries
- Many items are derived from crude petroleum, which provide raw materials for many new industries, these are collectively known as petrochemical industries
- This group of industries is divided into four sub-groups:
  (i) polymers, (ii) synthetic fibres, (iii) elastomes (iv) surfactant intermediate
- Mumbai is the hub of the petrochemical industries
- Cracker units are also located in Auraiya (Uttar Pradesh), Jamnagar, Gandhinagar and Hajira (Gujarat), Nagothane, Ratnagiri (Maharashtra), Haldia (West Bengal) and

Visakhapatnam (Andhra Pradesh)

- Three organisations are working in the petrochemical sector under the administrative control of the Department of Chemicals and Petrochemicals.These are-
    - Indian Petrochemical Corporation Limited (IPCL), a public sector undertaking. It is responsible for the manufacture and distribution of the various petrochemicals like polymers, chemicals, fibres and Fibre intermediates.
    - Petrofils Cooperative Limited (PCL), a joint venture of the Government of India and Weaver's Cooperative Societies. It produces polyester filament yarn and nylon chips at its two plants located at Vadodara and Naldhari in Gujarat.
    - Central Institute of Plastic Engineering and Technology (CIPET), involved in imparting training in petro-chemical industry

**Manufacturing of Polymers/Plastics**

. Polymers are made from ethylene and propylen

- These materials are obtained in the process of refining crude oil
- Polymers are used as raw materials in the plastic industry
- Among polymers, polyethylene is a widely used thermoplastic
- Plastic is first converted into sheets, powder, resin and pellets, and then used in manufacturing plastic product
- Plastic products are preferred because of their strength, flexibility, water and chemical resistance and low prices
- Production of plastic polymers started in India in the late fifties and the early sixties using other organic chemicals
- The National Organic Chemicals Industries Limited (NOCIL), established in private sector in 1961, started the first naphtha based chemical industry in Mumbai
- The plants located at Mumbai, Barauni, Mettur, Pimpri and Rishra are the major producers of plastic materials
- About 75% of these units are in small scale sector
- The industry also uses recycled plastics, which constitutes about 30% of the total production
- Synthetic fibres are widely used in the manufacturing of fabrics because of their inherent strength, durability, washability, and resistance to shrinkage.
- Industries manufacturing nylon and polyester yarns are located at Kota, Pimpri,

Mumbai, Modinagar, Pune, Ujjain, Nagpur and Udhna
- Acrylic staple fibre is manufactured at Kota and Vadodara

**Knowledge based Industries or IT(Information Technology)**

- The Information Technology (IT) revolution opened up new possibilities of economic and social transformation
- The IT and IT enabled business process outsourcing (ITESBPO) services continue to be on a robust growth path
- Indian software industry has emerged as one of the fastest growing sectors in the economy
- The software industry has surpassed electronic hardware production
- The IT software and services industry account for almost 2% of India's GDP
- A majority of the multinational companies operating in the area of information technology have either software development centres or research development centres in India
- A major impact of this growth has been on employment creation, which is almost doubled every year

**Liberalisation, Privatisation,Globalisation (LPG) and Industrial Development in India**

- The new Industrial Policy was announced in 1991
- The major objectives of this policy were
    - to build on the gains already made
    - correct the distortions or weaknesses that have crept in
    - maintain a sustained growth in productivity and gainful employment and attain international competitiveness

**Measures of Industrial Policy in India are-**

1. abolition of industrial licensing
2. free entry to foreign technology
3. foreign investment policy
4. access to capital market
5. open trade
6. abolition of phased manufacturing programme

7. liberalised industrial location programme

- The policy has three main dimensions: liberalisation, privatisation and globalisation
- The industrial licensing system has been abolished for all except six industries related to security, strategic or environmental concerns
- In the new industrial policy, Foreign Direct Investment (FDI) has been seen as a supplement to the domestic investment for achieving a higher level of economic development
- FDI benefits the domestic industry as well as the consumers by providing technological upgradation, access to global managerial skills and practices, optimum use of natural and human resources, etc
- The industrial policy has been liberalised to attract private investor both domestic and multi-nationals
- New sectors like, mining, telecommunications, highway construction and management have been thrown open to private companies
- Globalisation means integrating the economy of the country with the world economy
- Under this process, goods and services along with capital, labour and resources can move freely from one nation to another
- The thrust of globalisation has been to increase the domestic and external competition through extensive application of market mechanism and facilitating dynamic relationship with the foreign investors and suppliers of technology

**In Indian context, globalisation implies :**

i. opening of the economy to foreign direct investment by providing facilities to foreign companies to invest in different fields of economies activity in India
ii. removing restrictions and obstacles to the entry of multinational companies in India
iii. allowing Indian companies to enter into foreign collaboration in India and also encouraging them to set up joint ventures abroad
iv. carrying out massive import liberalisation programmes by switching over from quantitative restrictions to tariffs in the first place, and then bringing down the level of import duties considerably
v. instead of a set of export incentives, opting for exchange rate adjustments for promoting export

Out of the total proposed investment by the industrial entrepreneurs during 1991-2000 nearly one-fourth (23%) was for industrially developed Maharashtra, 17% for Gujarat, 7% for Andhra Pradesh, and about 6% for Tamil Nadu while Uttar Pradesh, the state with the largest population has only 8%

**Industrial Regions in India**

Several indices are used to identify the clustering of industries, important among them are :

i. the number of industrial units,
ii. number of industrial workers,
iii. quantum of power used for industrial purposes,
iv. total industrial output, and
v. value added by manufacturing, etc.

**Major industrial regions of the country are**

**1) Mumbai Pune industrial region**

- It extends from Mumbai-Thane to Pune & in adjoining districts of Nashik & Solapur
- Industrial development has been rapid in Kolaba, Ahmednagar, Satara, Sangli and Jalgaon districts

**Reason behind such development are**

i. Development of this is the location of cotton textile industry in Mumbai
ii. Mumbai, with cotton hinterland and moist climate favored the location of cotton textile industry
iii. Opening of the Suez Canal in 1869 provided impetus to the growth of Mumbai port
iv. Machineries were imported through this port
v. Hydro-electricity was developed in the Western Ghat region to meet the requirements of this industry
vi. With the development of cotton textile industry, chemical industry also developed
vii. Opening of the Mumbai High petroleum field and erection of nuclear energy plants added additional pull to this region.

- Engineering goods, petroleum refining, petrochemicals, leather, synthetic and plastic goods, drugs, fertilisers,electrical, shipbuilding, electronics, software, transport

equipments and food industries also developed in this region

- Important industrial centre's are Mumbai, Kolaba, Kalyan, Thane, Trombay, Pune, Pimpri, Nashik, Manmad, Solapur, Kolhapur, Ahmednagar, Satara and Sangli

**2) Hugli industrial region**

Reasons for development in this region are-

i. It is located along the Hugli river, this region extends from Bansberia in the north to Birlanagar in the south for a distance of about 100 km
ii. Industries also have developed in Mednipur in the west
iii. Kolkata-Haora form the nucleus of this industrial region
iv. It developed with the opening of river port on Hugli
v. Kolkata emerged as a leading centre of the country which was connected with interior parts by railway lines and road routes
vi. Development of tea plantations in Assam and northern hills of West Bengal, the processing of indigo earlier and jute later coupled with the opening of coalfields of the Damodar Valley and iron ore deposits of the Chotanagpur plateau, contributed to the industrial development of the region
vii. Cheap labour available from thickly populated part of Bihar, eastern Uttar Pradesh and Orissa also contributed to its development
viii. Kolkata, being the capital city of British India (1773-1911), attracted the British capital
ix. Cotton textile industry also grew along with jute industry, paper, engineering, textile machinery, electrical, chemical, pharmaceuticals, fertiliser and petrochemical industries have also developed within this region
x. Factory of the Hindustan Motors Limited at Konnagar and diesel engine factory at Chittaranjan are landmarks of this region
xi. Location of petroleum refinery at Haldia has facilitated the development of a variety of industries

Important industrial centres of this region are Kolkata, Haora, Haldia, Serampur, Rishra, Shibpur, Naihati, Kakinara, Shamnagar, Titagarh, Sodepur, Budge Budge, Birlanagar, Bansberia, Belgurriah, Triveni, Hugli, Belur, etc.

**4) Bangalore-Chennai Industrial Region**

- Till 1960, industries were confined to Bangalore, Salem and Madurai districts but now they have spread over all the districts of Tamil Nadu except Viluppuram
- Due to absence of coalfields in this region, its development is dependent on the Pykara hydroelectric plant, which was built in 1932
- Cotton textile industry was the first to take roots due to the presence of cotton growing areas
- Along with cotton mills, loom industry spread very rapidly in this region
- Aircraft (HAL), machine tools, telephone (HTL) and Bharat Electronics are industrial landmarks of this region
- Important industries are textiles, rail wagons, diesel engines, radio, light engineering goods, rubber goods, medicines, aluminium, sugar, cement, glass, paper, chemicals, film, cigarette, match box, leather goods, etc
- Petroleum refinery at Chennai, iron and steel plant at Salem and fertiliser plants are recent developments

**5) Gujarat Industrial Region**

The nucleus of this region lies between Ahmedabad and Vadodara but this region extends upto Valsad and Surat in the south and to Jamnagar in the west

**Reason for development in this region are-**

i. The location of the cotton textile industry since 1860s
ii. This region became an important textile region with the decline of the cotton textile industry at Mumbai
iii. Located in cotton growing area, this region has double advantage of the proximity of raw materials as well as of market
iv. The discovery of oil fields led to the establishment of petrochemical industries around Ankleshwar, Vadodara and Jamnagar
v. The port at Kandla helped in the rapid growth of this region
vi. Petroleum refinery at Koyali provided raw materials to a host of petrochemical industries

- Besides, textiles (cotton, silk and synthetic fabrics) and petrochemical industries, other industries are heavy and basic chemicals, motor, tractor, diesel engines, textile machinery, engineering, pharmaceuticals, dyes, pesticides, sugar, dairy products and food processing

- Largest petroleum refinery has been set up at Jamnagar
- Important industrial centres of this region are Ahmedabad, Vadodara, Bharuch, Koyali, Anand, Khera, Surendranagar, Rajkot, Surat, Valsad and Jamnagar

**6) Chotanagpur Region**

This  region extends over Jharkhand, northern Orissa and western West Bengal and is known for the heavy metallurgical industries

**Reason for development in this region are-**

i. Discovery of coal in the Damodar Valley and metallic and non-metallic minerals in Jharkhand and northern Orissa
ii. Proximity of coal, iron ore and other minerals facilitated the location of heavy industries in this region
iii. Six large integrated iron and steel plants at Jamshedpur, BurnpurKulti, Durgapur, Bokaro and Rourkela are located within this region
iv. To meet the power requirement, thermal and hydroelectric plants have been constructed in the Damodar Valley
v. Densely populated surrounding regions provide cheap labour and Hugli region provides vast market for its industries

- Heavy engineering, machine tools, fertilisers, cement, paper, locomotives and heavy electricals are some of the important industries in this region
- Important centres are Ranchi, Dhanbad, Chaibasa, Sindri, Hazaribag, Jamshedpur, Bokaro, Rourkela, Durgapur, Asansol and Dalmianagar

**7) Vishakapatnam-Guntur Industrial Region**

This industrial region extends from Vishakhapatnam district to Kurnool and Prakasam districts in the south

**Reason for development in this region are-**

i. This region hinges upon Vishakhapatnam and Machilipatnam ports and developed agriculture and rich reserves of minerals in their hinterlands
ii. Coalfields of the Godavari basin provide energy

iii. Petroleum refinery based on imported petroleum facilitated the growth of several petrochemical industries

- Sugar, textile, jute, paper, fertiliser, cement, aluminium and light engineering are principal industries of this region
- One lead-zinc smelter is functioning in Guntur district
- Iron and steel plant at Vishakhapatnam uses the Bailadila iron ore
- Vishakhapatnam, Vijayawada, Vijaynagar, Rajahmundry, Guntur, Eluru and Kurnool are important industrial centres

**8) Gurgaon-Delhi-Meerut Industrial Region**

- This region is located far away from the mineral and power resources, and therefore, the industries are light and market-oriented
- Electronics, light engineering and electrical goods are major industries of this region
- Besides, there are cotton, woollen and synthetic fabrics, hosiery, sugar, cement, machine tools, tractor, cycle, agricultural implements, chemical and vanaspati industries which have developed on large scale
- Agra-Mathura industrial area specialises in glass and leather goods
- Mathura with an oil refinery is a petrochemical complex
- Other important industrial center are Gurgaon, Delhi, Shahdara, Faridabad, Meerut, Modinagar, Ghaziabad, Ambala, Agra and Mathura

**9) Kollam-Tiruvanantapuram Industrial Region**

- This industrial region is spread over Tiruvanantapuram, Kollam, Alwaye, Ernakulam and Alappuzha districts
- Plantation agriculture and hydropower provide industrial base to this region
- Agricultural products processing and market oriented light industries predominate the region like cotton textile, sugar, rubber, matchbox, glass, chemical fertiliser and fish-based industries
- Food processing, paper, coconut coir products, aluminium and cement industries are also significant
- Important industrial centres are Kollam, Tiruvanantapuram, Alluva, Kocchi, Alappuzha, and Punalur