Chapter 11

Industries

EVOLUTION OF INDUSTRIES

Industrial development is considered as one of the important indicators of socioeconomic and human development. Before the rise of modern industries, India was known all over the world for its cottage and household industries. Indian muslin, silk goods, and artistic pottery were in great demand the world over. The arrival of English resulted in the decay of traditional handicrafts. The East India Company developed a policy of export of raw material from India to Britain and the import of finished products to India from Europe. It was because of this policy that no industry could be developed in India before 1854. In the later part of the 19th century the growth and development of industries in India was stunted and slow.

The industrial development in India started after 1854 when some cotton and jute mills were established by the British in Mumbai and Calcutta (Kolkata) respectively. The beginning of modern industrial phase may be traced back to the establishment of the first iron and steel charcoal plant at Port-Navo (Tamil Nadu). This mill was closed down in 1886. The first cotton textile factory was established at Mumbai in 1854, followed with the opening of a jute mill at Rishira near Calcutta (Kolkata) in 1855. The cotton textile industry expanded during 1870s when there was civil war in America. The number of cotton mills grew to 275 before the First World War. The progress in jute industry was, however, not satisfactory.

The beginning of iron and steel industry was even more delayed. The first iron and steel mill was established by Bengal Iron Works Ltd. at Kulti in 1874. It resulted in a failure and was shut down in 1881. The real development of iron and steel industry started in 1908 when a steel plant was established at Jamshedpur.

The first successful paper mill started at Ballygunj Circular Road in Kolkata in 1870. Two more paper mills in Kolkata and one in Lucknow (1879) started in 1905. It was in 1870, when the woollen textile mills were established in Bangalore (1886) (Karnataka), Dhariwal (1881) (Punjab), and Kanpur (1876) (Uttar Pradesh).

After the First World War, the Indian industries got a good boost as India became the main supplier of cotton and woollen textiles and liquors. The government gave protection to some of the industries. The period during the Second World War was a time of crisis as India got involved

into war. After the Second World War, the production fell down due to decreasing demand for industrial products, lack of capital, political unrest, transport bottlenecks, and labour strikes. The partition of the country in 1947 gave a severe blow to jute and cotton textiles as the raw material producing areas of jute and good quality cotton went to Pakistan.

As stated above, the post Second World War period was characterised by industrial turmoil. Production in most of the industries declined. The condition of cotton textiles, cement, paper, iron and steel industries, and consumer goods was worst due to the non-availability of raw material.

After Independence, the Government of India realised the importance of an appropriate industrial policy, which led to the Industrial Policy Resolution, 1948. According to this policy, the concept of mixed economy was introduced in which the state and the private enterprise were allowed to co-exist and co-prosper in the fields demarcated for them. This resolution divided the industries between public and private sectors.

INDUSTRIAL DEVELOPMENT DURING THE FIVE-YEAR PLANS

The real growth and development of the industrial sector in India started during the period of Five-Year Plans.

First Five-Year Plan (1951–56)

The main thrust of the First Five-Year Plan was on agricultural development. Therefore, the emphasis was on increasing capacity of the then existing industries rather than the establishment of new industries. Cotton, woollen and jute textiles, cement, paper, newsprint, power-looms, medicine, paints, sugar, *vanaspati* (vegetable oil), chemical and engineering goods, and transport equipments showed some progress.

Second Five-Year Plan (1956–61)

Great emphasis was laid on the establishment of heavy industries during the Second Five-Year Plan. The second industrial policy was announced in 1956. The main thrust of industrial development was on iron and steel, heavy engineering, lignite projects, and fertiliser industries. Moreover, there was emphasis on the expansion of existing steel plants, like Jamshedpur, Kulti-Burnpur, and Bhadravati. Three new iron and steel plants were located at Bhilai, Durgapur, and Raurkela. The Chittranjan Locomotive Workshop, the Hindustan Ship-building Yard (Vishakhapatnam), the Sindri Fertiliser Factory, and Hindustan Machine Tools Ltd. (HMT) at Bangalore were expanded. Many of the targets, however, could not be achieved because of the war with China in 1962 and the failure of monsoon over greater parts of the country.

Third Five-Year Plan (1961–66)

There was emphasis on the expansion of basic industries like iron and steel, fossil-fuel, power, and machine building. The Ranchi Machine Tool and three more HMT units were established. Machine building, locomotive and railway coach making, ship-building, air-craft manufacturing, chemicals, drugs, and fertiliser industries also made steady progress.

Fourth Five-Year Plan (1969–74)

The period between 1966 and 1969 was the period of annual plans. The industrial period could not make much progress during the annual plans period. During the fourth Five-Year Plan there

was much emphasis on the agro-based industries such as sugar, cotton, jute, *vanaspati*, metal-based, and chemical industries. It was during this plan when much progress was made in alloys, aluminium, automobile-tyres, electronic goods, machine tools, tractors, and special steel. Efforts were also made to accelerate the process of industrial dispersal.

Fifth Five-Year Plan (1974–79)

The main stress in this plan was on rapid growth of steel plants, export-oriented articles, and goods of mass consumption. The steel plants at Salem, Vijaynagar, and Vishakhapatnam were proposed to create additional capacity. The Steel Authority of India (SAIL) was constituted. Moreover, drug manufacturing, oil refining, chemical fertilisers, and heavy engineering industries made steady progress.

Sixth Five-Year Plan (1980–85)

The main emphasis in the Sixth Five-Year Plan was on producing goods to exploit the domestic and international markets. To achieve this objective industries like aluminium, automobiles, electric equipments, thermostatics were given the priority. Production targets were achieved in industries like commercial vehicles, drugs, T.V. receivers, automobiles, cement, coal, jute industry, non-ferrous metals, textiles, railway wagons, sugar industry, etc.

Seventh Five-Year Plan (1985–90)

The main thrust of the Seventh Five-Year Plan was on 'high tech' and electronic industries. Industrial dispersal, self employment, exploitation of local resources, and proper training were the preference areas of the plan.

Eighth Five-Year Plan (1992–97)

The period between 1990 and 1995 was the period of annual plan. There was a major change in the industrial policy of the Government of India which was initiated in 1991. The policy of liberalisation was adopted for the investment of foreign multi-nationals. Emphasis was given on the removal of regional imbalances and encouraging the growth of employment in small and tiny sectors.

Ninth Five-Year Plan (1997–2002)

The main emphasis during this plan was on cement, coal, crude oil, consumer goods, electricity, infrastructures, refinery, and quality steel products.

Tenth Five-Year Plan (2002–07)

During the Tenth Five-Year Plan, the main emphasis was on:

(i) the modernisation, technology upgrading, reducing transaction costs, and increased export;
(ii) to enhance export and to increase global competitiveness; and
(iii) to achieve balanced regional development.

To achieve these objectives and reduce the regional inequalities Special Economic Zones (SEZs) policy has been adopted. Moreover, industrial packages have been given to Himachal Pradesh, Jammu and Kashmir, and Uttarakhand. In addition to these, production of basic foods, capital goods, intermediate goods, and consumer goods has been encouraged.

Eleventh Five Year Plan (2007–12)

The 11th plan document entitled "Towards Faster and More Inclusive Growth" gave priority to: agriculture, irrigation, and water resources, education, health, infrastructure, and employment, along with programmes for SCs/STs, other backward classes, minorities, women and children. Government has realised that in recent years although economic growth has accelerated but it has failed to be 'inclusive'. In other words benefits of growth have not reached all sections of population particularly small farmers, landless labourers and persons working in unorganised sector have remained beyond the benefits of development. Eleventh plan stresses that benefits of development should reach all sections of population. This plan emphasizes on social justice. Eleventh plan recognizes that we need a growth process that brings faster reduction in poverty, generate employment and ensures essential services such as health, and education to all sections of the society.

INDUSTRIAL POLICY

The first industrial policy was announced by the government of India on April 6, 1948. In this policy both the public and private sectors were involved towards industrial development. Accordingly, the industries were classified into four broad categories:

1. **Exclusive State Monopoly**: This includes the manufacturing of arms and ammunition; production and control of atomic energy; and the ownership and management of railways.
2. **State Monopoly for New Units**: This category included coal, iron and steel, aircraft manufacturing, ship-building, manufacturing of telephone, telegraph and wireless apparatus (excluding radio receiving sets), and mineral oil. New undertakings in this category could, henceforth, be undertaken only by the state.
3. **State Regulation**: This category included industries of such basic importance like machine tools, chemicals, fertilisers, non-ferrous metals, rubber manufactures, cement, paper, newsprint, automobiles, electric engineering, etc. which the central government would feel necessary to plan and regulate.
4. **Unregulated Private Enterprise**: The industries in this category were left open to the private sector, individual as well as co-operative.

Industrial Policy, 1991

A major shift in the industrial policy was made by the Congress Government, led by P.B. Narasimha Rao on July 24, 1991. The main aim of this policy was to unshackle the country's industrial economy from the cobwebs of unnecessary bureaucratic control, induced liberalisation with a view to integrate the Indian economy with the world economy, to remove restrictions on direct foreign investment and also to free the domestic entrepreneur from the restriction of MRTP (Monopolies and Restrictrive Practices Act). Moreover, the policy aimed at shedding the load of public enterprises which have shown a very low rate of return or incurred losses over the years. The salient features of the 1991 industrial policy were:

1. Except some specified industries (security and strategic concerns, atomic energy, coal, social reasons, environmental issues, railways, atomic minerals, hazardous projects, and articles of elitist consumption), industrial licensing would be abolished.
2. Foreign investment would be encouraged in high priority areas upto a limit of 51 per cent equity.

3. Government would encourage foreign trade companies to assist Indian exporters in export activities.
4. With a view to inject desired level of technological dynamism in Indian industries, the government would provide automatic approval for technology agreements related to high priority industries.
5. Relaxation of MRTP (Monopolies and Restrictive Practices Act) which has almost been rendered non-functional.
6. Dilution of Foreign Exchange Regulation Act (FERA) making Rupee fully convertible on trade account.
7. Disinvestment of Public Sector Units' shares.
8. Closing of such public sector units which are incurring heavy losses.
9. Abolition of C.C.I. and wealth tax on shares.
10. General reduction in custom duties.
11. Provide strength to those public sector enterprises which fall in reserved areas of operation or in high priority areas.
12. Constitution of special boards to negotiate with foreign firms for large investments in the development of industries and import of technology.

COTTON TEXTILE INDUSTRY

Textile industry includes cotton, jute, wool, silk, and synthetic fibre textiles. India is one of the leading producers of textile goods. It is one of the largest and most important sector in the economy in terms of output, foreign exchange earning, and employment in India. Its contributioin forms 20 per cent of the industrial production, 10 per cent of the excise collection, 18 per cent of employment in the industrial sector, 20 per cent of the country's total export earning and 4 per cent of the GDP. At present, India is the *third* largest producer of silk, *fifth* largest producer of synthetic fibres, and has the *largest* loomage and spindles in the world.

India enjoyed monopoly in the production of textile goods from 1500 BC to 1500 AD. Indian cotton and silk textiles were in great demand all over the world. It was the arrival of the British in India and the Industrial Revolution in Britain in 1779 which led to the downfall of the Indian manufacturing. The British after the consolidation of their rule in India encouraged the export of raw material from India to Britain and import of manufactured goods from Britain to India. The first textile mill was established in 1854 in Mumbai by C.N. Dewar. The fast growth of cotton textile occurred in 1870 when there was much demand of Indian goods in the wake of American Civil War. Before the First World War the number of Indian textile mills rose to 271. The demand for cloth during the Second World War led to further progress of the textile industry.

The industry suffered a setback in 1947 as good quality cotton growing area went to Pakistan. Consequently, India had to import cotton from the African countries.

Cotton being a pure raw material provides a chance to establish textile mill either in the areas of raw material or in the market. In India, most of the textile mills are in the cotton growing areas or in the neighbouring cities and towns. The location of cotton textile industry is mainly affected by: (i) raw material, (ii) proximity to market, (iii) moist weather, (iv) capital, (v) skilled and cheap labour, (vi) transport, (vii) sea-port, (viii) export facility and the domestic and international markets. The trend of growth in cotton textile industry has been given in **Table 11.1**.

Table 11.1 *Growth of Cotton Textile Industry in India 1950–2006*

Year	*Cotton cloth (million sq. metres)*
1950–51	4215
1960–61	6738
1970–71	7602
1980–81	8368
1990–91	15,431
2000–01	19,718
2005–06	19,250

Source: ***Economic Survey 2005–06.***

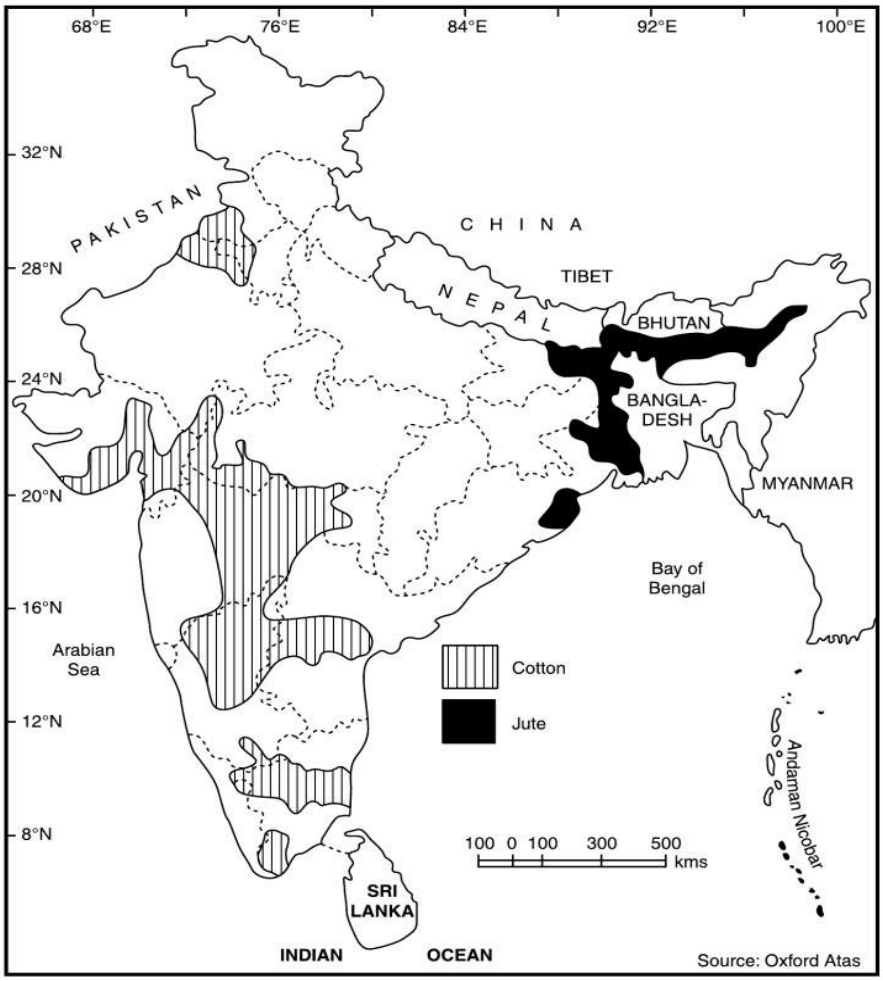

Fig. 11.1 Concentration of Cotton & Jute (2009–2010)

(i) **Cotton mills and factories:** In the earlier days of its development, mills were the main producers of cotton goods. For example, in 1950–51 over 80 per cent of the total cotton goods production was from the mills and factories, which dropped to only about 10 per cent in 2005–06. The production and employment is increasing steadily in the powerloom sector.

(ii) **Powerlooms:** The decentralised power-loom sector played a vital role in meeting the clothing needs of the country. The powerloom industry produces a wide variety of cloth with intricate designs and accounts for almost 83 per cent of the total cloth production.

(iii) **Handlooms:** The handloom sector provides over 12 per cent of the total production.

Most of the cotton mills and factories are located in the cotton producing regions of the country. The main cotton producing areas of the country have been shown in **Fig. 11.1.**

Distribution and Production of Cotton Goods State-wise

The cotton textiles production in India between 1980 to 2006 has been shown in **Fig. 11.2**. It may be seen from **Fig. 11.2** that the total production of cotton textile in 1980–81 was only about 8 million tonnes which rose to about 26 million tonnes in 2006.

The statewise distribution and production of cotton textile have been shown in **Table 11.2**. It may be seen from **Table 11.2** that Maharashtra is the leading producer of cotton textile, followed by Gujarat and Tamil Nadu. During 2010-11, the production of fabric was 61.81 billion sq. mtrs as compared to 49.58 billion sq. mtrs in 2005-06.

India's textile and clothing industry is one of the main stays of the national economy. It is also securing a 7 per cent share in the global textile trade (2011-12).

Table 11.2 *State-wise Production of Cotton Cloth in India*

State/Union Territory	*Production in sq metres*	*Percentage of All India Production*
1. Maharashtra	400,550	38.89
2. Gujarat	355,745	34.54
3. Tamil Nadu	65,850	6.40
4. Punjab	56,850	5.53
5. Madhya Pradesh	48,500	4.70
6. Uttar Pradesh	32,850	3.20
7. Rajasthan	28,880	2.80
8. Pondicherry	25,250	2.45
9. Karnataka	8,500	0.82
10. Kerala	6,850	0.67
Total	10,29,825	100.00

Source: ***Data Computed from Statistical Abstract, 2007***.

Maharashtra

The state of Maharashtra is the largest producer of cotton goods. The locational factors in the high concentration of cotton mills in the state of Maharashtra are:

(i) *Availability of raw material:* The state of Maharashtra is one of the leading producers of cotton.

(ii) *Climate:* The city of Mumbai where most of cotton mills are located has a mild climate with enough moisture in the air; so the thread does not break frequently.

(iii) Mumbai is close to Egypt, Sudan, and east African countries from where the long staple cotton is imported for the production of good quality of cloth.
(iv) *Labour:* Cheap skilled labour is available in the state.
(v) *Electricity:* Cheap electricity is available and there is not much power breakdown in the state.
(vi) *Market:* There is a large market of cotton products, both in India and abroad.

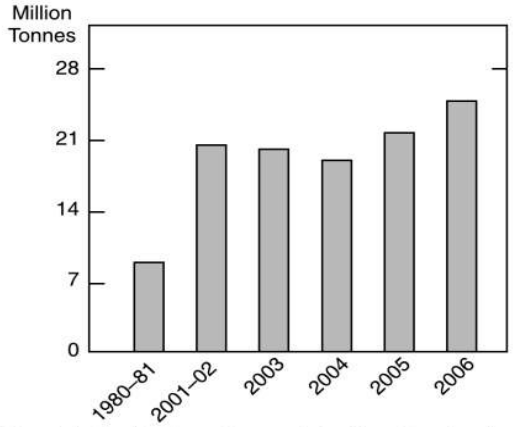

Fig. 11.2 India—Cotton Textiles Production

(vii) *Seaport:* The seaport of Mumbai is well connected by rails and highways.
(viii) *Investment:* There is no dearth of money investment in this industry.
(ix) *Entrepreneurs:* Mumbai being the commercial capital of the country enjoys the presence of entrepreneurs who are always willing to invest in this industry.
(x) *Early Start:* The state of Maharashtra and the city of Mumbai got the advantage of an early start in cotton textile industry.

With 122 cotton textile mills in Maharashtra, this industry contributes about 39 per cent of the total cloth production of the country. The city of Mumbai with 63 cotton mills is the largest producer of cotton in the country. The bulk production is in the form of light textured cloth, long cloth, shirting, domestics, sheets, *dhotis*, and coloured clothes. Due to the high concentration of cotton mills Mumbai is called the 'Cottonopolis of India'.

In Maharashtra, Sholapur is the second largest producer of cotton goods. It lies in the cotton growing area of south Maharashtra. Pune, Nagpur, Jalgaon, Akola, Sangli, Miraj, Kolhapur, Kalyan, and Thane are the other important cotton goods producing centres (**Fig. 11.3**).

Gujarat

Gujarat has 118 mills producing about 35 per cent of the total cotton goods of the country. The city of Ahmedabad is the second largest cotton producing centre after Mumbai in the country. It specialises in the production of fine qualities of *dhotis* and *saris* and a large variety of bleached, coloured, or printed fabrics. In addition to this Bhavnagar, Bharuch, Kalol, Kadi, Kelot, Khambat, Nanded, Porbander, Rajkot, Surat, Vadodra, and Viramgam are the other important cotton producing centres of Gujarat.

Tamil Nadu

Tamil Nadu has the largest number of cotton mills in the country. It is the third largest producer of cotton textile in the country. The largest number of mills are, however, in the city of Coimbatore which has over 200 small and big factories. Tamil Nadu's mills are however, smaller in size. This state produces about 45 per cent of the total yarn of the country. Chennai, Madurai, Perambur, Salem, Tiruchirappalli, Tirunelveli, and Tuticorin are the other important cotton textile centres in the state.

Fig. 11.3 Cotton Textile

Uttar Pradesh

Kanpur is the most important cotton textile centre of Uttar Pradesh. In addition to this, cotton textile industry is located in the cities of Agra, Aligarh, Bareilly, Etawah, Lucknow, Mirzapur, Modinagar, Modipuram, Moradabad, Saharanpur, and Varanasi.

West Bengal

Kolkata is the most important cotton textile producing centre of West Bengal. Cotton goods are also produced in Haora, Hugli, Murshidabad, Panihar, Sirampur, and Shiampur.

In addition to these, Ajmer, Beawar, Bhilwara, Ganganagar, Kishangarh, Jaipur, Kota, Pali, and Udaipur in *Rajasthan*; Amritsar, Ludhiana, and Phagwara in *Punjab*; Bhopal, Dewas, Gwalior, Indore, Jabalpur, Ratlam, and Ujjain in *Madhya Pradesh*; East Godavari, Guntur, Hyderabad, Secunderabad, and Udaygiri in *Andhra Pradesh*; Gaya, Bhagalpur and Patna in *Bihar*; Bhiwani, Hissar and Rohtak in *Haryana*; Bangalore, Belgaum, Chennapatnam, Chitradurga, Gulbarga, Mangalore, and Mysore in *Karnataka*; Alleppey, Alwaye, Kollam, Thiruvananthapuram, and Trichur in *Kerala* are the important cotton textile centres in the country.

In India, cotton goods are produced in the following three types of sectors: (i) Mills, (ii) Powerlooms, and (iii) Handlooms. The production of different sectors of cotton textile has been given in **Table 11.3**.

Table 11.3 *Production of Fabrics (in millions of sq metres)*

Sector	*2005–06*
1. Mills	1,656 (3.3 %)
2. Powerlooms including Hosiery	41,044 (82.8 %)
3. Handlooms	6,108 (12.3 %)
4. Others	769 (1.6 %)
5. Total	49,577

Source: ***Economic Survey, 2006-07***.

It may be observed from **Table 11.4** that in 1950–51 the total production of cotton textile was only 4225 million sq metres which increased to 55,000 sq metres in 2008–09 recording an increase of over 130 per cent.

Table 11.4 *Production of Cotton Cloth*

Year	*Production in million sq. metres*
1950–51	4225
1960–61	6750
1970–71	7600
1980–81	8400
1990–91	15,500
2000–01	19,700
2008–09	55,000

Source: India 2010, p. 643.

Problems of the Cotton Textile Industry

The cotton textile industry is suffering from many serious problems. Some of the problems of the cotton textile industry have been briefly presented here:

1. Shortage of Raw Material

There is a shortage of raw material especially of good quality cotton to meet the growing demand of the Indian textile industry. The fluctuating prices and uncertainties in the availability of raw material lead to low production and sickness of the mill. Consequently, long staple cotton is imported from Egypt, Sudan Kenya, Peru, Tanzania, Uganda, and USA. There is a need of Silver Fibre Revolution in the country.

2. Obsolete Machinery

Most of the Indian textile mills are working with obsolete machinery. According to one estimate 70 per cent of the spindles are more than 30 years of age. The outdated machinery cannot compete with the machinery of countries like China, Japan, South Korea, Taiwan, and USA which have the latest sophisticated machinery in their textile mills.

3. Erratic Power Supply

Power supply to most of the factories is inadequate and erratic which adversely affects the production of goods.

4. Strikes and Lockouts

The cotton textile industry suffers seriously because of frequent strikes by the workers. Occasionally the owners lockout the mills which decreases the production of goods.

5. Competition in Foreign Market

The Indian cotton goods are facing a stiff competition in foreign markets, especially from China, Egypt, Japan, South Korea, and Taiwan.

6. Heavy Excise Duties

The cotton textile industry suffered because of heavy excise duties. The high rate of duty on imported cotton has increased the cost of production of clothes which has created problems in selling the cloth in the international market.

7. Competition with Synthetic Fibres

The poor people of the country prefer to use synthetic fibre clothes which are more durable and attractive.

8. Sick Mills

In India more than 130 mills are sick. The machinery of these mills is obsolete which can only be replaced with heavy investment. The slow pace of modernisation, outdated machinery, and old technology are some of the long-term problems which need to be addressed.

JUTE TEXTILE

India is the largest producer and second largest exporter of jute goods in the world, contributing about 35 per cent of the total output of the world. It is a labour intensive industry which directly and indirectly provides job to more than 4 lakh people. The industry is, however, facing a tough competition from synthetics and its export market is shrinking.

The first jute factory in India was established at Rishira, about 20 km north of Calcutta in 1854. The industry made tremendous progress in the later part of the 19th century. Subsequently, the industry was boosted by the two world wars. The industry suffered a serious setback in 1947 due to the partition of the subcontinent. After partition about 80 per cent of the jute growing areas went to East Pakistan (Bangladesh), while nearly 90 per cent jute mills remained in India. In 1959, the international demand of jute products decreased substantially as a result of which 112 jute factories were closed down. At present there are only 79 jute producing mills in India. Most of these mills are along the Hugli river, especially to the north of Kolkata. Out of total 79 jute mills, 62 are located in West Bengal, 3 each in Bihar and U.P., seven in Andhra Pradesh and one each in Assam, Odisha, Tripura and Chhattisgarh.

The jute mills are integrated units consisting of both spinning and weaving units. The main products of jute industry are gunny bags, canvas, pack-sheets, cotton-jute, paper-lined Hessians, Hessian cloth, carpets, carpet-backings, rugs, cordage, and twines.

Jute industry is mainly a raw material based industry. Most of the jute mills are in the jute producing areas of the country. West Bengal alone accounts for 85 per cent of the total jute production of the country (**Fig. 11.1 and Fig. 11.4**). The high concentration of Jute mills in West Bengal (**Fig. 11.5**) is because of the following factors:

1. *Availability of raw material:* Jute cultivation needs highly productive, well-drained soils and hot and humid climate. These conditions are ideally available in many tracts of West Bengal and Lower Assam.
2. Cheap and skilled labour is available in West Bengal, one of the most densely populated state of the country.
3. Cheap water transport through the Hugli river.
4. Availability of coal from the Raniganj coal-mines.
5. Export facility through the port of Kolkata and Haldia.

In addition to West Bengal, jute mills are also located in Eluru, Guntur, Ongole and Vishakhapatnam (Andhra Pradesh); Darbhanga, Gaya, Katihar and Samastipur (Bihar); Kanpur (Uttar Pradesh); and Raigarh (Chhattisgarh). The jute mills outside the Hugli belt are generally smaller in size. The total production from these 25 mills is only about 3 per cent of the total production of jute goods.

Jute industry in India is essentially export-oriented. India stands second after Bangladesh in the export of jute and jute products. Jute goods are exported to USA (30 per cent), Russia (25 per cent), UAE ((10 per cent), and UK, and Germany (2 per cent each). Among the other importers of Indian jute goods, Argentina, Australia, CIS, Cuba, Indonesia, Japan, Myanmar, Malaysia, Singapore, Sudan, and Thailand are important.

Problems of the Jute Textile Industry

The jute industry of India is confronted with many problems. Some of the important problems of jute industry are given here:

1. Shortage of Raw Material

Despite expansion of jute growing area and intensification of its cultivation, India is not self-sufficient in the supply of raw material. To meet the growing need of the industry, raw material is imported from Bangladesh, Brazil, and Philippines. There is a need of Golden Fibre Revolution in the country.

2. Obsolete Machinery

Most of the machinery in jute mills is more than 25 years old. These machinery are outdated and lead to low production.

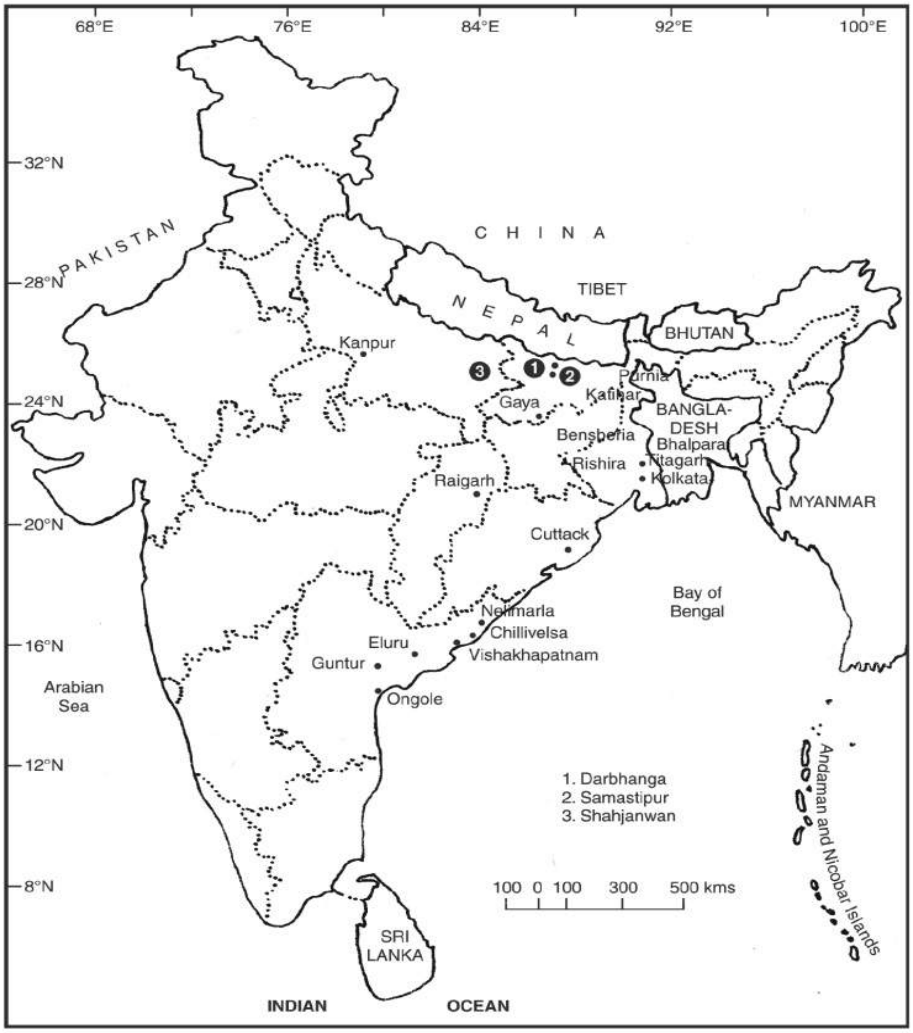

Fig. 11.4 Jute Industrial Centres

3. International Competition

India is facing a tough competition from Bangladesh, Brazil, Japan, Philippines, and South Korea.

4. High Prices

The high price of raw material is making the jute products expensive. Consequently, a number of jute mills are becoming sick units.

5. Decrease in the Demand of Jute Products

The overall demand of jute products is steadily decreasing in the international market.

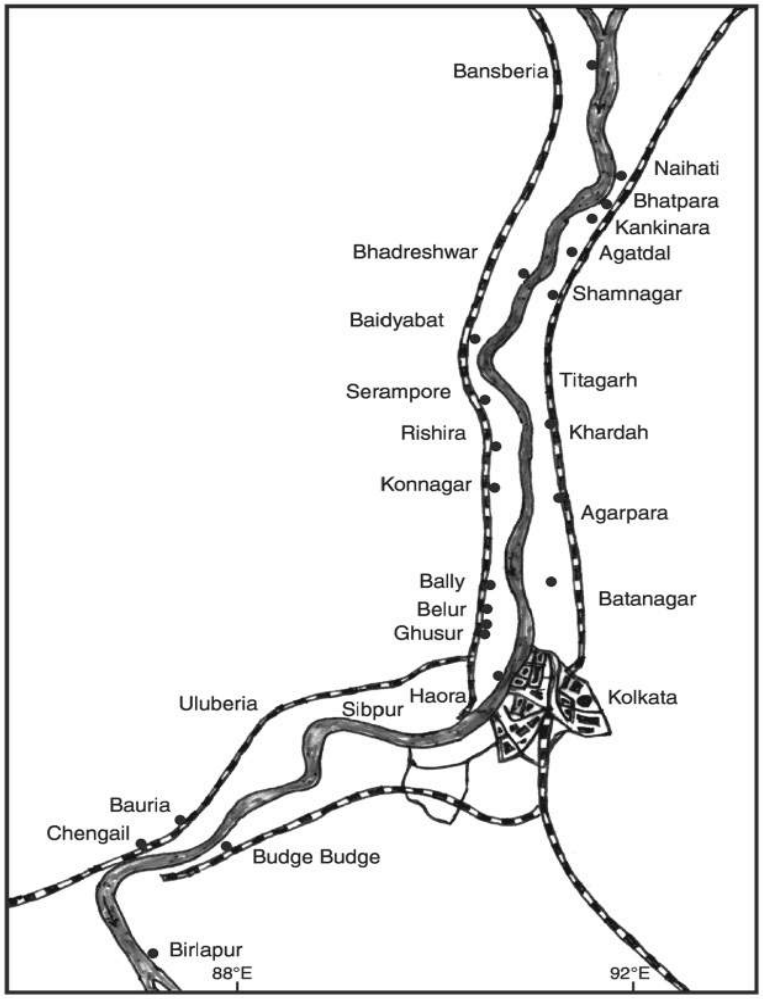

Fig. 11.5 Hugli Valley Jute Mills

6. Strikes and Lock-outs

The trade unions frequently go on strike which hamper the routine production of jute goods.

7. Competition from Substitutes

Jute industry is facing a tough competition from synthetic bags.

WOOLLEN TEXTILES

Woollen textile is one of the oldest industries of India. During the ancient and medieval periods woollen clothes were manufactured at the cottage industry level. The modern woollen textile industry

started with the establishment of '*Lal Imli*' at Kanpur in 1876. It was followed by the setting up of '*Dhariwal*' at Punjab in 1881. Subsequently woollen mills were established in Mumbai (1882) and Bangalore (1886). The industry made tremendous progress after Independence. At present there are 625 big and small woollen textile factories in the country.

The main concentration of woollen textile industry is found in Punjab, Maharashtra, and Uttar Pradesh. Other states which are producing woollen goods are Gujarat, Jammu and Kashmir, Karnataka, and West Bengal (**Fig. 11.6**).

In Punjab, there are more than 260 small and big mills which are located mainly in Amritsar, Dhariwal, Kharar and Ludhiana. In Maharashtra, Mumbai is the leading producer having 45 woollen factories. In Uttar Pradesh, woollen factories are located at Kanpur, Agra, Mirzapur, Modinagar,

Fig. 11.6 Woollen Textile

Shahjahanpur, and Varanasi. In Gujarat, Ahmedabad, Jamnagar, Kalol, and Vadodra are the main producers of woollen goods. In Haryana, Bahadurgarh, Faridabad, Gurgaon, and Panipat are the centres of woollen textile production. In Rajasthan, Alwar, Beawar, Bikaner, Bhilwara Jaipur, Jodhpur, Sikar and Nagaur are the important woollen textile centres. Bangalore, Kolkata, Haora, Srinagar, Kullu (Himachal Pradesh), Salem and Chennai are the other woollen textile centres. This industry provides employment to 27 lakh workers in the wide spectrum of activities (India 2012, p. 726).

India is not self sufficient in quality wool production. Good quality wool is, however, imported from Australia. The important items of export are blankets, caps, carpets, cardigans, druggets, gabbas, hosiery, jerseys, mufflers, *Namdas*, pullovers, shawls, and socks. These goods are exported to USA, UK, Australia, Belgium, Canada, Denmark, France, Germany, the Netherlands, Russia, South West Asian, and African countries.

Problems of the Woollen Textile Industry

The woollen textile industry is facing the problems of:

(i) Shortage of quantity and quality of wool
(ii) Obsolete machinery
(iii) Competition with more advanced countries
(iv) Competition with synthetic fibres
(v) Shortage of power
(vi) Low quality of goods
(vii) Lack of market
(viii) Strikes by the workers

SILK TEXTILE

India's position in silk production is number two in the world after China, contributing 18% of the total silk production of the world. India has the monopoly in the production of *muga* silk, produced in Assam and Bihar. Silk textile was essentially a household industry in the early stage of its development. The Mughals were very much fond of silk clothes. The cotton goods used to be exported to the countries of south-west Asia and Europe. The first silk mill was, however, located at Haora by the East India Company in 1832. The industry made tremendous progress after Independence.

Distribution

The states of Andhra Pradesh, Assam, Bihar, Jammu and Kashmir, Karnataka, Tamil Nadu, Uttar Pradesh, and West Bengal are the leading producers of silk textile goods. The silk manufacturing centres have been shown in **Fig. 11.7**.

The state of Karnataka is the largest producer of silk textile. Bangalore, Belgaum, Gokak, Kolar, Mandya, Mysore, and Tumkur are the main producing centres. Channapatna and Mysore are the main centres of silk textile in the state. Silk yarn from these centres is exported to Arani, Dharmavaram, Kancheepuram, Kumbakonam, Surat, and Varanasi.

In West Bengal, the main centres of silk textile are Basawa, Bishenpur, Chak-Islampur, Kolkata, and Madhu-Ghat (Maldah District). In Andhra Pradesh, silk textile is concentrated in Anantapur,

Chittor, Karimnagar, Vishakhapatnam, and Warangal. In Bihar, Bhagalpur; in Jharkhand, Hazaribagh and Ranchi; in Assam, Barpeta, Goalpara, Kamrup, Nalbari, and Naogaon are known for silk textile. In Tamil Nadu, Coimbatore, Dharmapuri, Kancheepuram, Nilgiri, Salem, and Tirunelveli; while in Madhya Pradesh, Balghat, Bastar, Bilaspur, Raigarh, and Surguja are the silk textile centres. Silk textile is also concentrated in Anantnag, Baramulla, Doda, Jammu, Riasi, Srinagar, and Udhampur in Jammu and Kashmir.

India is one of the important exporters of silk textile. Silk and silk products are exported to USA, UK, Kuwait, Russia, Oman, Saudi Arabia, Singapore, and UAE.

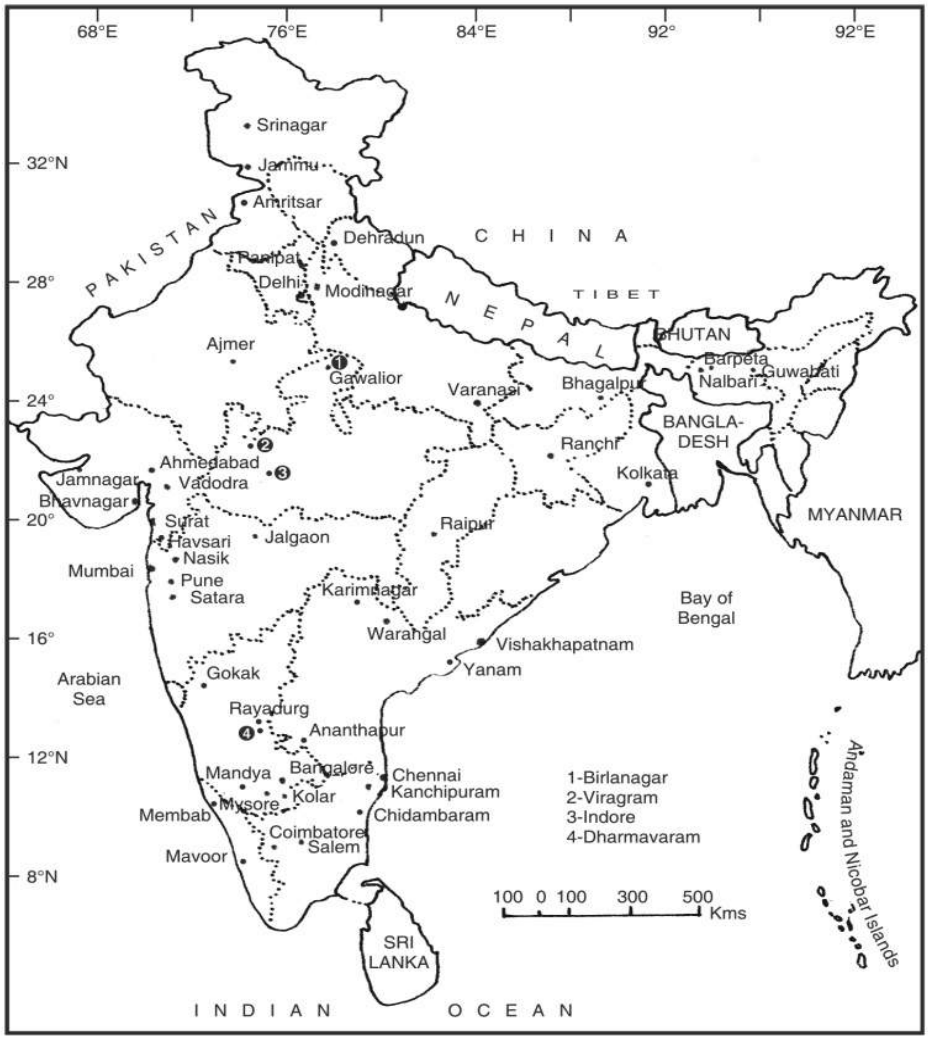

Fig. 11.7 Silk Textile

IRON AND STEEL INDUSTRY

The history of iron and steel industry in India is nearly 4000 years old. The famous iron pillar near Qutab Minar is dating back to 350 AD. The first attempt to produce iron and steel on modern lines was made in 1830 at Porto Nova, near Chennai (Tamil Nadu). But it was not successful as the smelting used to be done with the help of charcoal. Pig-iron was produced in 1874 for the first time by the Bengal Iron Works. The real progress in the iron and steel industry was made in 1907 when J.N. Tata established the smelting factory at Sakchi (the former name of Jamshedpur). Subsequently, the Indian Iron and Steel Company Ltd. (IISCO) was set up at Hirapur in 1918, and the Visveswaraya Iron and Steel Limited (VISL) at Bhadravati in 1923.

It was in the Second Five-Year Plan 1956–61, when tremendous progress was made by the iron and steel industry. It was during this plan, when integrated iron and steel plants were established at Bhilai, Durgapur, and Raurkela. The Bokaro Iron and Steel Plant was established with the help of Russian government in 1964. The Steel Authority of India (SAIL), was set up in January 1973. In the Fifth Five-Year Plan, it was resolved to set up four new iron and steel plants at Paradwip, Salem, Vijaynagar, and Vishakhapatnam. At present India is the 5th largest producer of crude steel in the world.

Locational Factors

The raw material used in the iron and steel industry are iron ore, manganese, flux, limestone, fuel (coking coal), and fire-clay. It consumes heavy quantity of coal and iron-ore. Both these minerals are weight-losing. Consequently, it is located either at the site of coal mines or near the iron-ore deposits. All these raw materials including water, bauxite, dolomite, etc. and coal are found in the Chotanagpur Plateau. The state of Bihar, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Odisha, Tamil Nadu, and West Bengal are rich in the raw material required for the smelting of iron-ore.

Iron and Steel Plants in India

There are twelve important iron and steel plants in India (**Fig. 11.8**). Except TISCO, all the big integrated plants are in public sector. The steel plants under public sector are supervised by the Steel Authority of India Limited (SAIL). A brief description of the main steel plants of India has been given in the following:

1. The Tata Iron and Steel Company (Jamshedpur)

TISCO Plant is located at the confluence of Subernrekha and Kharkai rivers about 240 km north-west of Kolkata in the Singhbhum District of Jharkhand. It was established in 1907; the production of pig-iron started here in 1908 and that of steel in 1911.

The Jamshedpur Steel Plant has an ideal location at which the transportation cost is the least (**Fig. 11.9**). It obtains the supply of iron-ore from Badam-Pahar (Mayurbhanj-Odisha), Noamundi (Singhbhum District of Jharkhand); coking coal from Jharia and Bokaro, manganese from Keonjhar (Odisha); limestone and fire-clay from Sundargarh District (Jharkhand), and fresh water from the Subernrekha and Kharkai rivers. Being situated in the tribal belt, cheap labour is also available and the finished products can be exported through the port of Kolkata.

TISCO produces pig iron, high grade steel, acid steel for making railway wheels, axles, bars,

bolts, corrugated-sheets, nails, nuts, rods, sheets, steel-casting, tinplates, tyres, and wires. Special alloy steel produced by the plant is used for making bullet-proof armour plates and for armour-piercing bullets.

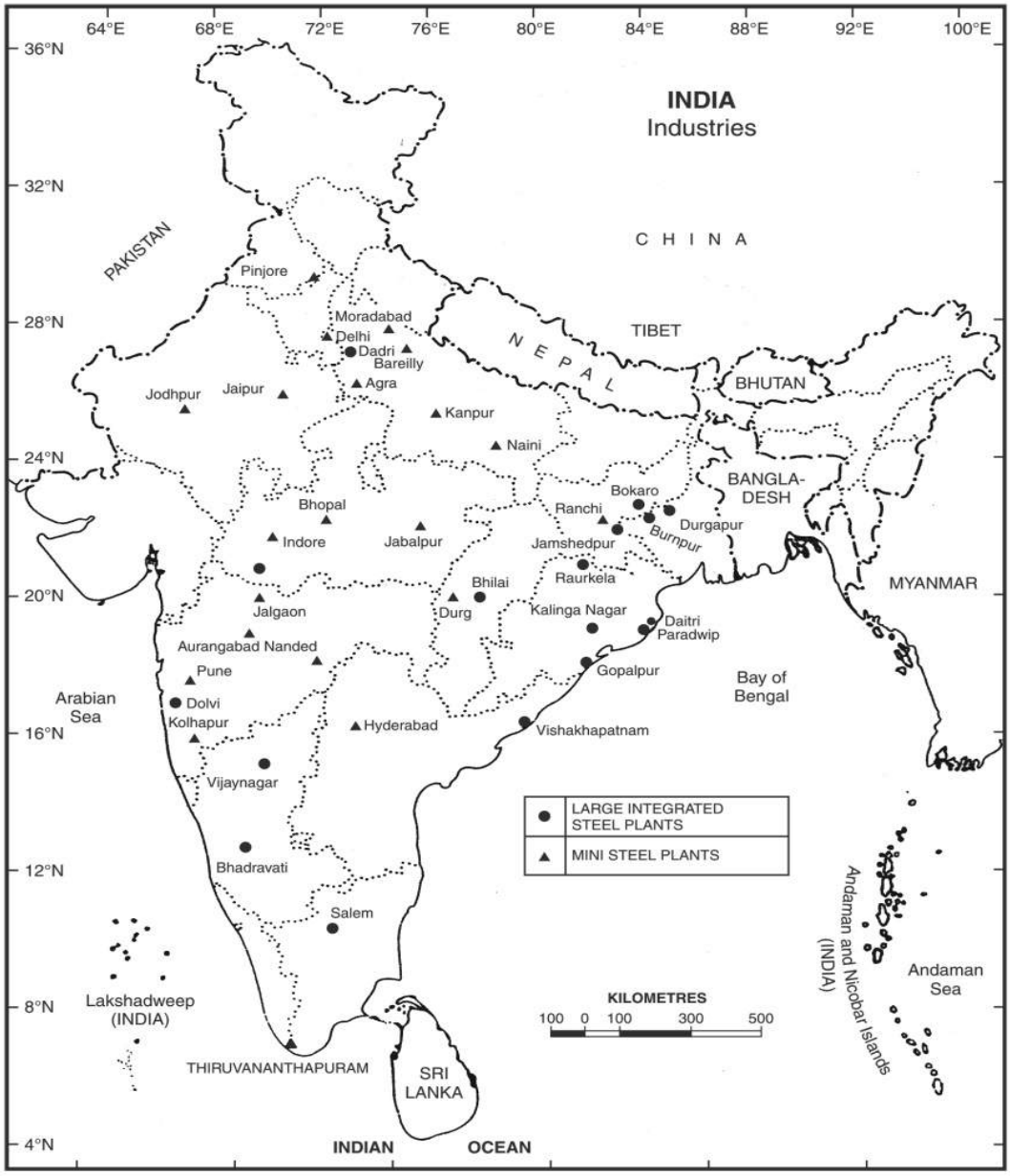

Fig. 11.8 Iron and Steel Industry

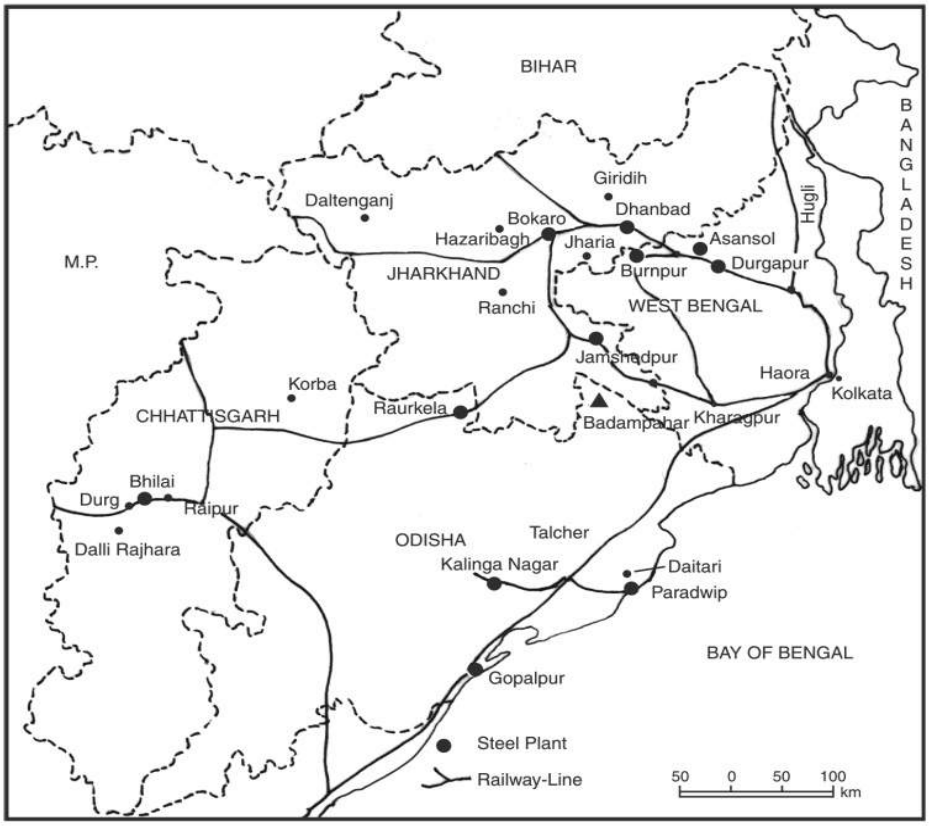

Fig. 11.9 Chotanagpur Plateau Iron and Steel Plants

2. Burnpur, Indian Iron and Steel Company (IISCO)

The Indian Iron and Steel Company, founded in 1918, and the Steel Corporation of Bengal, founded in 1927, were merged under the former name in 1952. It has three separate plants at Burnpur (about 5 km south-west of Asansol), Hirpur (about 6 km south of Asansol) and Kulti (about 16 km west of Asansol). The management of these steel plants was taken over by the government in 1972.

These steel plants obtain iron ore from their mines at Goa. The coal is obtained from Ramnagar mines of Jharia, which is only about 3 km from Kulti. Manganese is obtained from Bihar, Jharkhand, Madhya Pradesh, and Odisha; fire-clay from Singhbhum. Moreover, cheap hydro-electricity is available from the Damodar Valley Corporation (DVC) and water from the Damodar river. Cheap labour is available from within the tribal belt of the region and Bihar, while the seaport of Kolkata helps in the export of the finished product.

3. The Bhadravati Iron and Steel Plant (VISL)

The Visveswaraya Iron and Steel Limited at Bhadravati, formerly known as Mysore Iron and Steel Limited was established in 1823. The plant was taken over by the Central Government in 1962. It obtains iron ore from Kudermukh, Baba Budan Hills (Chikmaglur District of Karnataka). Manganese,

limestone, dolomite, and fire-clay are also available within a distance of 50 km, electricity from the Jog and Shravati Power Projects.

This plant is one of the major producers of alloy and special steel in the country. It also produces casting iron, ferro-silicon, mild-steel and, spun-pipes.

4. Bhilai Iron and Steel Plant (HSL)

The Bhilai Iron and Steel Plant was established with the technical co-operation of Russain Government (erstwhile Soviet Union) in the Durg District of Chhattisgarh in 1959. It obtains its iron ore from the Dhalli-Rajhara mines about 95 km south of the plant, coal from Korba (Chhattisgarh), Bokaro and Jharia (Jharkhand), manganese from Balaghat and Bhandara, limestone from Nandani mines only 18 km from Bhilai, water from Tandula Canal and Reservoir, electricity from the Korba Thermal Power Station. As it is located in the tribal belt of Chhattisgarh, cheap labour is locally available. The finished products are exported through the port of Vishakhapatnam.

Bhilai steel plant specialises in the production of pig-iron, crude-steel, and plates for ship-building industry. The plant also produces byproducts like ammonium sulphate, benzol, coal-tar, and sulphate-acid.

5. Raurkela Iron and Steel Plant (Hindustan Steel Limited)

The Raurkela Steel Plant is located in the Sundargarh District of Odisha along the Kolkata-Nagpur railway line. It was built with the technical co-operation from the German firm, Krupps and Demang in 1959. The plant obtains its iron-ore from Mayurbhanj; coal from Bokaro, Jharia, Talcher, and Korba; manganese from Sundargarh; water from the Sankha and Koel rivers (tributaries of Brahmani); and hydro-power from the Hirakud Dam. Cheap labour is available from the Jharkhand and densely populated Bihar state.

It specialises in the production of flat products. The main products of this steel plant are cold-rolled-sheets, hot-rolled-sheets, galvanised sheets and electrical steel plates. The plant also releases large quantity of nitrogen as by-product of fertilisers and various chemicals like anthracite-oil, benzole, crude-anthracite, crude-phenol, naphtha, naphthalene, and wash-oil.

6. Durgapur Iron and Steel Plant (HSL)

The Durgapur Iron and Steel Plant was established with the help of British companies in 1956; production started in 1962. The city of Durgapur is located along the Damodar River. It obtains iron-ore from Singhbhum (Jharkhand), and Kendujhar (Odisha), coal from Raniganj, manganese from Balaghat (M.P.), and water from the Damodar river. It produces ingot steel.

7. Bokaro, Bharat Steel Limited (BSL)

The Bokaro Steel Plant was located with the help of the Soviet collaboration in 1964. It obtains its iron ore from Keonjhar District; coal from Bokaro, Jharia, and Kargali coal mines; lime from Daltonganj in Palamu District; dolomite from Bilaspur District; and water from the Tenu Dam across the Damodar river.

Bakaro is essentially a flat product plant, and the hot and cold rolling mills are its main production units. Its sludge and slag are being used in making fertilisers at Sindri.

8. Salem Steel Plant

This steel plant was commissioned in 1982. It obtains iron-ore from the neighbouring areas, manganese, dolomite and limestone are also available within a distance of 60 km. Cheap power and labour and enormous market are the added advantage. It produces iron and steel of special grade.

9. Vijayanagar Steel Plant

This steel plant is located near Hosepet in the Bellary District of Karnataka. It obtains iron-ore from Hosepet; coal from Kanhan valley (Chhattisgarh)and Singareni (Andhra Pradesh); limestone and dolomite are also available within a distance of 150 km; water from the Tungbhadra Reservoir (about 35 km); and cheap hydel-power from the Tungbhadra Project. In this plant steel is produced with the Corex process which makes use of non-coking coal.

10. Vishakhapatnam Steel Plant

The foundation of this steel plant was laid in 1971 and the actual production was commissioned in 1992. This steel plant was established by the Rashtriya Ispat Nigam Limited (National Steel Corporation Ltd.). This is the only steel plant of India which has a coastal location. It obtains iron-ore from Bailadila (Chhattisgarh); coal from Bokaro, Raniganj, and Jharia; limestone and dolomite from Bastar (Chhattisgarh), Madhya Pradesh, and Odisha. It specialises in the production of steel and the quality of its steel can be compared to global standards.

11. Daitari Steel Plant

A steel plant has been located at Daitari near Paradwip in Odisha. Initially it was to be established in collaboration with the British and South Korean companies. Its responsibility has, however, been given to the Tata Group. It has a capacity of 2.6 million tonnes.

12. Dolvi Steel Plant

A new steel plant is being set up by the Ispat Industries Limited at Dolvi in the Ratnagiri District of Maharashtra. This steel plant is equipped with the latest technology in steel manufacturing. It requires less space, less energy, high labour productivity, and less cost of production. The plant is capable of producing strips as thin as 1.00 mm. Its annual capacity is 3 million tonnes.

13. Tata Steel, Kalinganagar

This steel plant has been undertaken by the Tata Steel Company. The first phase of the project was completed in 2005.

14. Pasco Steel, Paradwip

The Pohang Steel Company of South Korea has agreed with the Odisha Government to establish an iron and steel plant at Paradwip. The project is likely to be commissioned in 2016. It is one of the biggest foreign direct investment (FDI) in India. When complete, it will require over 600 million tonnes of iron-ore for the production of iron and steel.

15. Mini-Steel Plants

In addition to these, there are more than 225 mini-steel plants with a capacity of 10,000 tonnes to 5 lakh tonnes. The main factors responsible for the growth and establishment of mini-steel plants are:

(i) Heavy demand for iron and steel
(ii) Lower cost of production
(iii) Controlled price of the steel
(iv) Easy availability of scrap at lower prices from home and abroad
(v) Lower capital investment
(vi) Shorter gestation period

The production of steel in India between 1980 and 2006 has been shown in **Fig. 11.10** while **Table 11.5** gives the production of pig-iron and steel. It may be observed from Table 11.5 that the production of finished was only about one million tonnes in 1950–51 which rose to 32.50 million tonnes in 2005–06

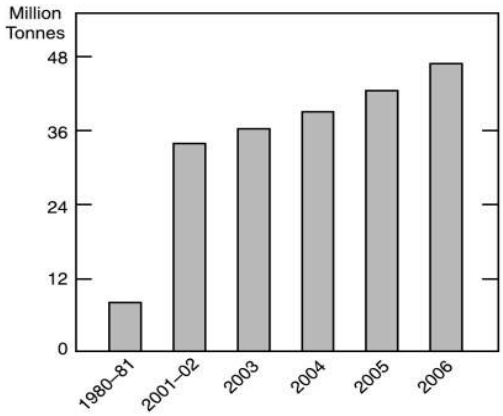

Fig. 11.10 India—Production of Steel

Table: 11.5 *Trends in the Production of Iron and Steel in India (in million tonnes)*

Year	*Pig iron*	*Steelingots*	*Finished steel*
1950–51	1.69	1.47	1.04
1960–61	4.31	3.48	2.39
1970–71	6.99	6.14	4.64
1980–81	9.55	10.33	6.82
1990–91	12.15	11.10	13.53
2000–01	03.39	25.88	29.27
2005–06	04.25	28.35	32.50

Source: ***Indian Economic Survey, 2005–06 and India 2007***.

Problems of Iron and Steel Industry

The Iron and Steel Industry of India is facing the following problems:

1. Heavy Investment

The establishment of iron and steel industry requires huge amount of capital. Moreover, the plant has a long gestation period. Construction of iron and steel plants is a difficult proposition, and therefore, most of the steel plants are in the public sector.

2. Obsolete Technology

The iron and steel plants established during the Second Five-Year Plan are not working to the full capacity as the machinery is outdated. Moreover, the high cost of coking coal has affected the industry adversely.

3. Inefficient Public Sector

Most of the iron and steel plants in public sector are incurring heavy losses mainly due to poor management and under-utilisation of capacity.

4. Controlled Prices

The government has fixed price for iron and steel which leaves very little margin of profit for the manufacturers.

5. Sickness of Mini-Steel Plants

Due to the inadequate supply of power and sharp increase in the raw materials, many of the small iron and steel plants are either experiencing sickness or are being closed down.

6. Inadequate Supply of Coking Coal

India's coking coal deposits are confined largely to the Raniganj and Jharia coal mines. These coal mines have become fairly deep and the cost of product of coal has gone up. Consequently, the input cost of energy is going up, affecting the output and margin of profit adversely.

7. Competition in the International Market

In the international markets, it is becoming increasingly difficult to compete with the steel of Australia, Brazil, France, Germany, Japan, Canada, Sweden, UK, and USA.

ALUMINIUM INDUSTRY

Aluminium is the second most important metallurgical industry of the country. It plays a very vital role in the overall industrial development of the country. Its elasticity and good conductivity of electricity and heat, and capacity to be moulded into any desired shape has made it a universally accepted metal. It is widely used in the generation and distribution of electricity, manufacturing of aeroplanes, railway coaches, defence and nuclear accessories, utensils, packing, and for making coins. It is a cheaper substitute of steel, copper, zinc, lead, etc. in a large number of industries.

Locational Factors: Availability of *bauxite* (raw material) and hydro-electricity are the basic requirements for the establishment of aluminium industry.

The production of one tonne of aluminium requires approximately six tonnes of bauxite. About 30 to 40 per cent of the production cost of aluminium is accounted for electricity alone. Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Tamil Nadu are the major producers of bauxite in India.

Development: The aluminium industry was started in India during the Second World War at Alupuram (Alwaye) by the Aluminium Company in 1938. It was later on converted into a public sector company in 1944. Another company, namely Aluminium Corporation of India started production of alumina in 1942 at Jaykaynagar (West Bengal). At the time of Independence, there were only two plants in the country with a total installed capacity of 4000 tonnes of ingots. During the Second Five-Year Plan two new aluminium plants were established at Hirakud (INDAL) and Renukoot (HINDALCO). Another plant was established in the Third Five-Year Plan at Mettur (MALCO) in 1967. The INDAL established a new plant at Belgaum in 1970. Later on the Bharat Aluminium Plant was established at Korba. Consequently the annual production increased to more than three lakh tonnes in 1979. At present, there are seven major aluminium producing plants in

the country. The location of aluminium plants have been shown in **Fig. 11.11.** A brief account of the important aluminium plants has been given here:

Important Aluminum Plants

1. The Indian Aluminium Company Ltd. (INDAL), Hirakud

This company started production in 1938 as a private company and was converted into a public company in 1944. It is an integrated plant having three units at five different places for the production of alumina and aluminium sheets. The plants for the extraction of alumina from bauxite are located at Muri (Jharkhand), near the bauxite mines. Its three smelting units are located at Alupuram (Alwaye in Kerala), Hirakud (Odisha), and Belgaum (Karnataka). The rolling mill at Belur (West Bengal)

Fig. 11.11 Aluminium Industry

manufactures aluminium sheets, rod, aluminium paste, electrical conductors, and domestic utensils. The plant gets bauxite from the Bagru Hills near Lohardaga, coal from Damodar valley, and hydro-electricity from Hirakud. The plant has an installed capacity of one lakh tonnes of aluminium ingots.

2. The Aluminium Corporation of India, Jaykaynagar (near Asansol)

The production from this plant was started in 1942. The plant gets bauxite from Ranchi (Jharkhand) and Unchera (M.P.). It has its own coal-mine, a thermal power plant and an alumina plant, a reduction plant, a sheet rolling plant and a utensils producing plant. It has a capacity of producing 90,000 tonnes of aluminium ingots annually.

3. The Hindustan Aluminium Corporation Ltd. (HINDALCO), Renukoot

This plant was set up at Renukoot, about 160 km south of Mirzapur, in 1958. It obtains bauxite from Lohardaga (Jharkhand and Amarkantak region of Madhya Pradesh), and power from the Rihand Dam. Its installed capacity is 1.26 lakh tonnes of ingots per annum, manufacturing mainly aluminium sheets and wires.

4. The Madras Aluminium Company Ltd. (MALCO), Mettur

This company set up its plant at Mettur near Salem in 1965. It obtains bauxite from the Shevaroy Hills and electricity from the Mettur Hydel Project. Its installed capacity is 25,000 tonnes of aluminium ingots.

5. The Bharat Aluminium Company Ltd. (BALCO), Korba

This is a public sector company which set up its plant at Korba (Bilaspur District, Chhattisgarh) in 1965. It obtains bauxite from the Amarkantak (Shahdol District of Madhya Pradesh) and electricity from the Korba Thermal Power Plant. The plant has an installed capacity of 2.00 lakh tonnes of ingots per year. The government has recently disinvested its share to a private company namely, Sterlite Industries, India (March 2001).

6. The National Aluminium Company Ltd. (NALCO), Koraput

Located at Koraput, it is the largest aluminium plant of the country. The Company was incorporated in 1981. It obtains bauxite from the bauxite mines at Panchpatmali (District Koraput). It has an installed capacity of 1.6 million tonnes of ingots per year. There is an alumina refinery at Damanjodi (District Koraput) and alumina smelter at Angul. It obtains hydro-electricity from the Angul Power Plant and the port facilities from the Vishakhapatnam for export of alumina and import of caustic soda. It has a capacity of production of alumina of 8 lakh tonnes per annum. The Central Government has disinvested about 45 per cent of NALCO's shares.

The Government has approved the second phase expansion of NALCO's Integrated Aluminium Complex in 2004 at the outlay of Rs. 4,091.51 crore to be completed by 2008. With this expansion, capacity of Bauxite Mines Refinery, Smelter, and Captive Power Plant will increase from 4.8 million tonnes per year to 6.3 million tonnes per year.

Table 11.6 *India: Trends of Aluminium Production (000 tonnes)*

Year	*Production*
1950–51	4.0
1960–61	18.5
1970–71	169.0
1980–81	199.00
1990–91	450.00
2000–01	560.00
2005–06	585.00

The aluminium industry has made a commendable progress during the planned period. It may be seen from **Table 11.6** that the total production of aluminium was only 4 thousand tonnes in 1950–51 which rose to 585 thousand tonnes in 2005–06. Despite appreciable progress in the production of aluminum, India is not self-sufficient in matter of aluminium.

Trade

India is almost self-sufficient in the matter of aluminium. Except some high quality aluminium which it imports from the foreign countries. The demand for good quality of aluminium is on the increase and consequently, India is importing aluminium and its products from the developed countries.

Problems

The major problem of the aluminium industry is international competition. India has the best grade of bauxite but unfortunately, the quality of products are not at par to that of the countries like Australia, Canada, France, Germany, Japan, UK, and USA.

Non-availability of power at a cheaper rate, strikes, and labour unrests are the other problems this industry is facing.

AUTOMOBILE INDUSTRY

Automobile indusry in india is one of the largest in the world and one of the fastest growing globally. India manufactures over 11 million vehicles (including 2 wheeled and 4 wheeled) and exports about 1.5 million every year. By 2050, India is expected to top the world in cars number with 600 million on the nation's roads.

The automobile industry of India made a steady progress after independence. It was in 1947 when the Premier Automobiles Ltd. was established at Kurla (Mumbai). In 1948, the Hindustan Motors Ltd. Uttarapara was established near Kolkata. Within a short period of about fifty years, automobile industry in India has made a tremendous progress. At present, there are 17 manufacturers of passenger cars, 9 manufacturers of commercial vehicles, 16 producers of two and three wheelers and 14 producers of tractors, besides 5 manufacturers of engines. In 2010-11, India produced about 3 million passenger vehicle, 7.5 lakh commercial vehicles, 8 lakh three wheelers, 13.38 million two wheelers. The percentage growth rate in 2010-11 was 27.45. (India 2012, p. 704)

The automobile industry was delicensed in July 1991 with the announcement of the New Industrial Policy. The passenger car was, however, delicensed in 1993. At present 100% Foreign Direct Investment

(FDI) is permissible in automobile industry. The auto industry directly or indirectly employ 12.5 million people and contributes 5 per cent of national GDP (India 2012, p. 704).

The automobile industry is mainly located near the iron and steel producing centres as steel is the basic raw material used in the industry. The automobile industry is also located near the markets and the seaports. Some of the automobile industries have been located in the under-developed areas of isolation and relative isolation (**Fig. 11.12**).

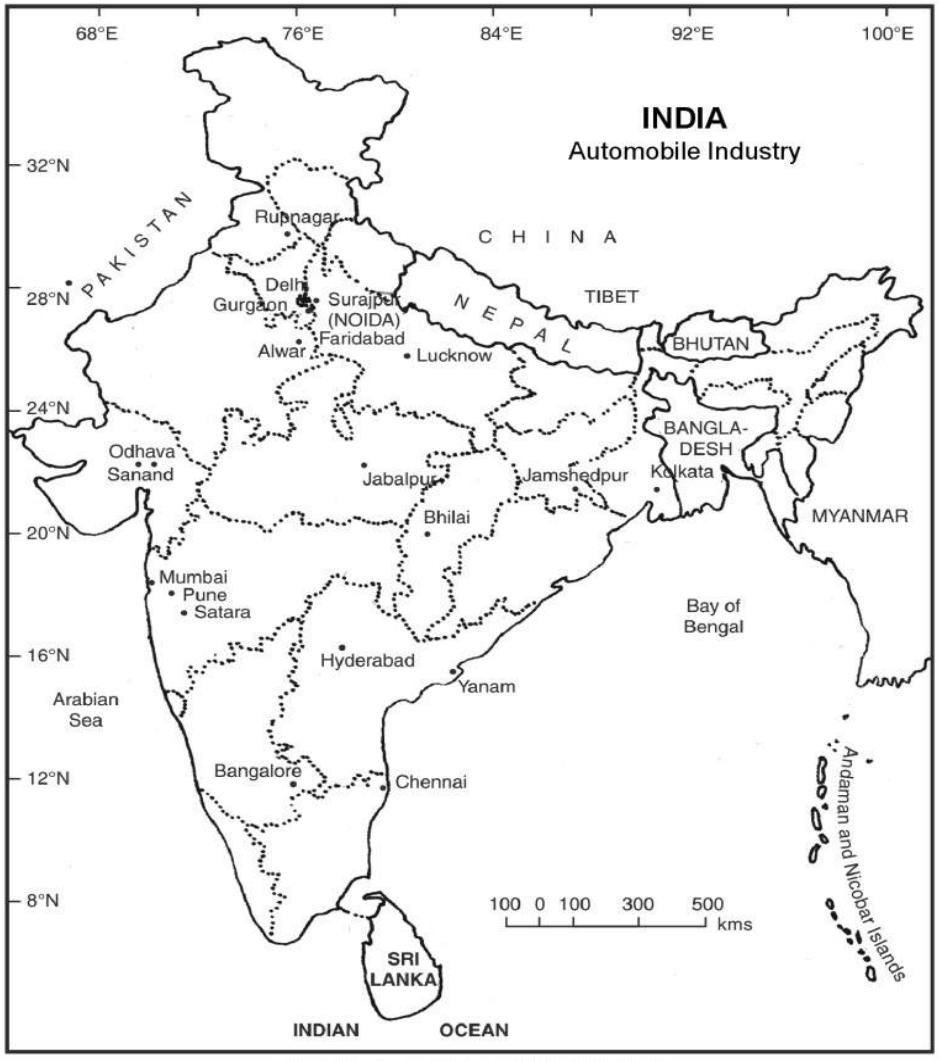

Fig. 11.12 Automobile Industry

The main automobile producing centres are: Chennai, Delhi, Gurgaon, Jabalpur, Jamshedpur, Kolkata, NOIDA (U.P.) and Mumbai. Motorcycles are produced at Faridabad and Mysore. Scooters

are manufactured at Akurdi (near Pune), Lucknow, Odhav (near Ahmedabad), Panki (near Kanpur), and Satara in Maharashtra.

The commercial vehicles are produced by Tata Engineering and Locomotive Co. (TELCO). It produces over 70 per cent of the total commercial vehicles. Its four plants are located at Hyderabad, Pithampur (Madhya Pradesh), Rupnagar (Punjab), Surajpur (NOIDA—Uttar Pradesh). The Premier Automobiles and Mahindra and Mahindra are located at Mumbai; Ashok Leyland Ltd. and Standard Motors at Chennai; Hindustan Motors Ltd. at Kolkata, and Bajaj Tempo Ltd. at Pune. Moreover, Shaktiman Trucks are manufactured under the Ministry of Defence and Nissan Jeeps at Jabalpur in collaboration with the Nissan Company of Japan.

Table 11.7 *Production of Vehicles in 2005–06*

Category	*Production in numbers in 2005–06*
Passenger Car	10,45,881
Multi-Utility Vehicles	2,63,032
Commercial Vehicles	3,91,078
Two Wheelers	76,00,801
Three Wheelers	4,34,424
Total	**97,35,216**

Source: ***India, 2007,*** pp.550–551.

Passenger Cars

The demand of passenger cars has increased tremendously during the last two decades (**Fig. 11.12**). There are a number of companies producing passenger cars. Some of the important car manufacturers are: (i) Maruti Udyog Limited, Gurgaon (Haryana); (ii) Hindustan Motors (Chennai and Kolkata); (iii) Premier Automobiles, (Mumbai); (iv) Standard Motor Products, Chennai; (v) Hyundai Motors India: Surajpur (NOIDA-Uttar Pradesh); (vi) Daewoo Motors India Ltd. near Pune; (vii) Honda City (Uttar Pradesh); (viii) The collaboration between Mahindra and Ford has introduced the Ford Escort; (ix) Mercedes Benz of Germany in collaboration with Telco is producing expensive E220 and 250D; and (x) the Premier Automobiles in collaboration with Fiat-Ind-Auto Limited has introduced Fiat Uno car.

Jeeps

The entire production of jeeps is contributed by Mahindra and Mahindra, Mumbai. It has a capacity to produce 15,000 jeeps annually.

Two and Three Wheelers

There is an increasing demand of two and three wheelers all over the country. In fact, the two-wheeler industry has a great future. The two-wheeler industry comprises moped, scooters, and motorcycles. Mopeds are produced mainly by TVS-Suzuki, scooters by Bajaj Auto and LML at Mumbai, Pune, New Delhi, and Kanpur. Public sector units are located at Alwar, Bangalore, Hyderabad, Lucknow, and Satara. The motorcycle producing units are located at Chennai, Delhi, and Mysore.

FERTILISER INDUSTRY

Fertiliser industry has made a tremendous progress after independence. The first fertiliser plant was established in India in 1906. The five decades of planning and development of fertiliser industry have brought India to the frontline of fertiliser producing countries. India today is the third largest producer of nitrogenous fertilisers in the world after China and USA. The domestic production of urea in the year 2010–2011 was about 164 lakh tonnes which is 85% of the urea requirement of the country, while the per hectare consumption was about 129 kg. per hectare.

The public sector has been playing a dominant role in the fertiliser industry. The first state-owned fertiliser unit was set up in 1951 at Sindri in Bihar (Jharkhand) which was followed by another plant at Nangal in Punjab. At present, there are, 57 fertiliser units manufacturing a wide range of nitrogenous and complex fertilisers, 29 units producing urea, and 9 units producing ammonium sulphate as a by-product. Besides there are 68 medium and small scale units in operation producing single superphosphate.

For a fertiliser industry, the basic raw materials are neptha, rock-phosphate, sulphur gypsum, and smelter gases. In case gas is not available, the plant may be operated with the help of coke and coke-oven-gas. In India, we have coal based fertiliser plants at Bhilai and Korba (Chhattisgarh), Durgapur (West Bengal), Ramgundam (Andhra Pradesh), Jamshedpur and Sindri (Jharkhand), and Rourkela and Talcher (Odisha). Neyveli is based on lignite while Hazira (Gujarat) and Thal (Maharashtra) use natural gas from the Bombay High. Most of the fertiliser plants are located close to the petroleum refineries. Plants near sea are based on imported material. Some of the fertiliser plants have, however, been located near the consumer centres. The maximum number of fertiliser plants are in the state of Gujarat and Tamil Nadu (**Fig. 11.14**).

Fertiliser Units in India

At present, there are 70 fertiliser producing units in the country. The Fertiliser Corporation of India (FCI), the National Fertilser Limited, the Hindustan Fertiliser Corporation, the Rashtriya Chemicals and Fertiliser Limited (RCF), the Fertilisers and Chemicals Travancore Limited (FACT), the Madras Fertiliser Limited, the Paradwip Phosphate Limited (PPL), and the Projects and Development Limited India are some of the important public sector undertakings.

1. The Fertiliser Corporation of India Limited (FCI)

The FCI was established in 1961 to take over the management of Sindri and Nangal (Punjab) fertiliser factories. Now the Fertiliser Corporation of India has four units, one each at Sindri (Jharkhand), Gorakhpur (UP), Talcher (Odisha), and Ramagundam (Andhra Pradesh). The Gorakhpur plant has remained closed since 1990 due to obsolete technology.

2. The National Fertilisers Limited (NFL)

The NFL was established in 1974. It has its units at Bhatinda, Nangal, Panipat, and Bijaipur. It specialises in the production of calcium ammonium nitrate.

3. The Hindustan Fertiliser Corporation Limited (HFC)

It was established in 1978. It has five operation units one at each at Barauni (Bihar) and Durgapur (West Bengal), and three at Namrup (Assam).

7. The Paradwip Phosphate Limited (PPL)

This was established in 1981. Its first plant was commissioned in 1986 and the second phase of the project was completed in 1992 to produce phosphoric acid and sulphuric acid.

Co-operative Sector

There are a number of fertiliser plants in the co-operative sector out of which, the Indian Farmers Fertiliser Co-operative Limited (IFFCO) is the most important. IFFCO has six production units one each at Aonla—two units (Bareilly), Kalol and Kandla (Gujarat), and Phulpur—two units (Allahabad). The KRIBHCO has a gas based urea-ammonia plant at Hazira in Gujarat.

India is not self sufficient in the matter of chemical fertilisers. About 50 per cent of the country's requirement is met by import.

The consumption, indigenous production, and imports of fertilisers in terms of fertiliser nutrients (NPK) during the period 2000–2001 and 2005–2006 are given below:

Table 11.8 *Consumption, Production, and Imports of Fertilisers (lakh tonnes)*

Year	*Consumption*	*Production*	*Imports*
2000–01	167.02	147.04	20.91
2007–08	225.70	147.06	77.56

Source: ***India, 2010***, p. 667.

It may be seen from **Table 11.8** that the consumption of chemical fertilisers in 2007–08 was 220 lakh tonnes out of which 190 lakh tonnes was produced indigenously and the remaining 30 per cent was imported.

Aonla: Situated in the District of Bareilly, the Aonla Chemical Fertiliser Plant was established by the Indian Farmers Fertilisers Co-operative Limited. The plant was commissioned in 1974. It meets the requirements of the farmers of the Rohilkhand Division of Uttar Pradesh.

Hazira: Situated in the state of Gujarat, Hazira is a modern chemical fertiliser plant. The smelting in this plant is done with the help of natural gas obtained from the Bombay High.

Kalol: Situated in the state of Gujarat, Kalol is one of the important petro-chemical complex of India. In addition to refinery it produces nitrogenous and phosphoric fertilisers. The natural gas for the production of fertilisers is obtained from the Gulf of Khambat.

Sindri: The first chemical fertiliser plant of India in public sector was established at Sindri in 1951 in the state of Jharkhand (erstwhile Bihar). The chemical fertilisers are produced with the help of coking coal. It is the main supplier of chemical fertilisers to the states of Bihar, Jharkhand, and West Bengal.

PAPER INDUSTRY

Paper industry is one of the core industries. It is a unique product which helps in the preservation of information and propagation of noble ideas and thoughts. In fact, the paper industry has a vital role to play in socioeconomic development of the country. It has great social and cultural significance. The per capita consumption of paper is considered as a bench mark of a country's modernization.

Paper making in India as a cottage industry was started during the Medieval Period, but the first paper mill was set up in 1832 at Serampore (West Bengal). It, however, resulted in a failure.

Problems of Paper Industry

Some of the important problems of paper industry are:

(i) Shortage of raw material
(ii) Inadequate supply of chemicals
(iii) Heavy investment
(iv) Strikes and lockouts
(v) Tough competition with the foreign paper producers
(vi) Obsolete machinery

Fig. 11.15 Paper Industry

(vii) High cost of basic inputs
(viii) Quality and environmental concern

PHARMACEUTICAL INDUSTRY

The drugs and pharmaceutical industry has made a phenomenal progress in India during the last four decades. The country now ranks 3rd in terms of volume of production (10% of global share) and 14th largest by value. Indian exports are destined to various countries around the globe including USA, Europe, Japan and Australia (2011-12). There are five Central Public Sector Undertakings and five joint Sector Undertakings in the pharmaceutical Industry Sector under the administrative control of the Department of Chemicals and Petrochemicals. Besides, there are two wholly-owned subsidiaries. A brief profile of these organisations is given in the following paragraphs.

1. Indian Drugs and Pharmaceuticals Limited (IDPL)

It was incorporated in 1961. The company has presently three manufacturing plants one each at Rishikesh in Uttarakhand, Hyderabad (Andhra Pradesh) and Gurgaon (Haryana). IDPL has two wholly owned subsidiaries, namely IDPL (Tamil Nadu) Ltd., Chennai in Tamil Nadu and Bihar Drugs and Organic Chemicals Limited at Muzaffarpur (Bihar). In addition, IDPL has two joint sector undertakings, promoted in collaboration with the respective State Governments. These are Rajasthan Drugs and Pharmaceutical Limited (RDPL), Jaipur and Odisha Drugs and Chemicals Ltd. (ODCL), Bhubaneshwar (**Fig. 11.16**).

2. Hindustan Antibiotics Limited (HAL), Pimpri (Pune)

It was incorporated in 1954. This was the first public sector company in drugs and pharmaceuticals. It has its plant located at Pimpri. There are three joint sector units promoted by HAL in collaboration with the respective State Governments. These are Karnataka Antibiotics and Pharmaceuticals Ltd. Bangalore (Karnataka), the Maharashtra Antibiotics and Pharmaceuticals Ltd. (MAPL) at Nagpur (Maharashtra), and Manipur State Drugs and Pharmaceuticals Ltd. (MSDPL) at Imphal (Manipur). The company produces a wide range of pharmaceutical formulations including agro-vet products.

3. The Bengal Chemicals and Pharmaceuticals Limited (BCPL)

It was incorporated in 1981. The company has four manufacturing units located at Maniktala (Kolkata), Panihati (24 Parganas West Bengal), one in Mumbai and one at Kanpur.

Most of the drugs and pharmaceutical units in India are located in Delhi, Gujarat, Maharashtra, Madhya Pradesh, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh, and West Bengal. The important centres are Ahmedabad, Delhi, Hyderabad, Indore, Kanpur, Kolkata, Jaipur, Mumbai, Muzaffarpur (Bihar), Pune, Rishikesh (Uttarakhand), and Vadodra. The Surgical Instruments Plant at Chennai produces different types of surgical instruments, while the Bengal Chemicals and Pharmaceutical Limited (BCPL) with four manufacturing units is the largest producer of anti-snake venom in India.

Although it is producing a large variety of drugs and is meeting 75 per cent of its requirements by indigenous products. India is importing expensive life saving drugs from Australia, France, Germany, Italy, Japan, Russia, Singapore, Spain, UK, and USA.

4. Measures to give further impetus to R & D in the drug sector:
   (a) Newly developed drugs would be put outside price control for a period of 10 years;
   (b) Department of Chemicals and Pharmaceuticals to set up inter-ministerial group to decide, within a set time frame, on measures to give further impetus to R & D in the drug sector; and
   (c) Ministry of Health and Family Welfare to take suitable steps for the quick clearance of new drug application, especially those developed through indigenous R & D.
5. The system of price control would be operated through a single list of price-controlled drugs, selected on the basis of transparent and objective criteria as laid down in the modification in drug policy 1986.
6. In case of basic manufacture, the rate of return would be higher by four per cent over the existing rates which are 14 per cent on net worth or 22 per cent on capital employed.
7. To achieve uniformity in prices of widely used formulations there should be ceiling on prices for commonly marked standard pack-sizes of price-controlled formulations.
8. The National Pharmaceutical Pricing Authority to entrust with the task of price fixation/ revision and other related matters.
9. Government to keep a close watch on the prices of medicines which are taken out of price control.
10. A National Drug Authority to be set up to look after the quality control aspects, national use of drugs, and related matters.
11. To provide better focus to all matters relating to developing and promotion of indigenous and other systems of medicines, a separate department would be created by the Ministry of Health and Family Welfare.

Pharmaceutical Policy, 2002

The government of India announced the New Pharmaceutical Policy 2002. The salient features of the policy are:

(i) Industrial licensing for all bulk drugs to be cleared by Drug Controller General of India.
(ii) Foreign direct investment upto 100 per cent will be permitted subject to the stipulations laid down from time to time.
(iii) Automatic approval for foreign technology agreement.
(iv) Ceiling price may be fixed for any formulation.
(v) Government will keep a close watch on the prices of medicines.
(vi) Price fixation by the Pharmaceutical Pricing Authority, an independent body of experts.

COTTAGE INDUSTRIES

The production of finished goods by a worker, sometimes together with his family, at home is known as cottage industry. The products may be sold directly to the public by the worker, or to an entrepreneur who pays according to number of goods produced. Cottage industry has a long history in India. It exists in almost all the states and regions of the country. Thus, the cottage industry involves the family labour and with the minimum investment the family attempts to increase its income. Some of the important cottage industries in India are *Bidi*-making, sports goods, basket-making, lac industry, manufacture of crackers, paper machie, perfumery, needlework on shawls, and wearings.

The main raw materials used in the *bidi* are *tendu* leaves (*Diospyros melanoxylon*) and *kachnal* (*Bauhinia racemosa*), found in the forests of Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, and Western and Eastern Ghats. Inferior tobacco which is an important ingredient of *bidi*-making is obtained from Andhra Pradesh, Bihar, Chhattisgarh, Madhya Pradesh and Uttar Pradesh. The annual production of *bidi* is more than 1000 crores. India exports *bidi* to the Asian, African, and European countries.

India produces the entire equipments for athletics goods: basket-ball, cricket, tennis, badminton, baseball, billiard, carrom, chess, dart, football, golf, gymnastics, squash, volleyball, and water-polo. Many of these products are produced in the cottage industry.

Bidi-making

This is a popular cottage industry. It is mainly produced in Bastar, Belgaum, Bhandara, Bhind, Gondia, Hyderabad, Jabalpur, Jagdalpur, Kamptee, Kheda, Mangalore, Nagpur, Nasik, Pune, and Vadodra.

Sports-goods

Sports goods making is a traditional cottage industry in the country. The raw materials used in sports goods are fine quality of wood, leather, cloth, rubber, and metal. These are locally available. Some of the finer quality of raw materials are, however, imported. Sports goods cottage industry, mainly concentrated in the rural and urban areas of Jalandhar, Ludhiana, Ahmedabad, Ambala, Chennai, Delhi, Jammu, Kolkata, Ludhiana, Meerut, Modinagar, Moradabad, Mumbai, Mysore, Nainital, Pune, Saharanpur, Shimla, and Srinagar.

Basket-making

This is generally confined to the hilly and mountainous areas of the country. The important raw materials used in the basket-making are bamboo, cane, and willow. The main producers of baskets are Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Sikkim, Tripura, and Uttarakhand.

Lac Industry

Lac is a natural resin secreted by an insect (*Cerria lacca*). This insect thrives on *babool, bargad, pipal, kusum,* and *palash.* The important products produced with the help of lac as a raw material are adhesives, electrical insulators, gramophones records, nail-polish, and printing ink.

This cottage industry is concentrated in the districts of Assam, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Nagaland, Odisha, Sikkim, Tripura, Uttar Pradesh, Uttarakhand and West Bengal.

India is the third most important lac producing country in the world after Thailand and Malaysia. About 85 per cent of the total production of lac is exported to France, Germany, Italy, Japan, Russia, UAE, UK, and USA.

Others

Needlework on cloths, especially on shawls is a speciality of the cottage industry in Kashmir, while Lucknow is famous for needlework on *kurtas* and wearings. In Tamil Nadu, cracker-making is an important cottage industry which has a great future.

INDUSTRIAL REGIONS OF INDIA

Delineation of industrial regions empirically has been attempted by a number of geographers. The parameters used by them, however, differ from each other. It was Trewartha and Burner (1944) who divided India into industrial regions. Subsequently, P.P. Karan and W.M. Jenkrins (1959) demarcated the industrial regions of India. Industrial regions of India were also delineated by Spencer and Thomas (1968), R.L. Singh (1971), B.N. Sinha (1972), M.R. Chaudhry (1976), and the Centre for Monitoring Indian Economy (1971, 1982) CMIE. These scholars adopted one or more than one of the following indicators for the demarcation of industrial regions of India:

1. Number of registered factories in a region.
2. Number of industrial workers.
3. Population engaged in the secondary activities.
4. Percentage of industrial workers to the total workers.
5. Gross industrial output.
6. Production in terms of money.

In the demarcation of industrial regions, most of the experts divided India into six major and six minor industrial regions. A brief description of the industrial regions of India as demarcated by Prof. R. L. Singh has been given here (**Fig. 11.17**).

The Major Industrial Regions

1. The Mumbai-Pune Industrial Region

This is the most important industrial region of the country (**Fig. 11.17** and **Fig. 11.18**). The region developed after the arrival of British in India who developed the Mumbai Seaport. After the opening of Suez Canal in 1869 the sea-route between India and Europe was reduced substantially. The development of this industrial region is closely connected with the history of development of cotton textile industry in India. The humid climate, natural port facilities, availability of hydro-power, skilled labour, and a vast hinterland producing cotton became the main factors in the development of this industrial region.

There are more than 8000 registered factories only in the Greater Mumbai, out of which 350 belong to cotton textile. The other industries of the region are engineering goods, chemical industries, food-processing industries, leather goods, pharmaceutical, and film industries. In Mumbai, the bulk of the production is light textured fine and super fine cotton cloths. Over 15 lakh people are engaged in the industrial sector of this region.

Pune is the second most important industrial centre of the region. It has more than 1200 registered factories. Its industries are producing metallurgical, chemical, engineering, and automobile goods. Pune has two factories producing scooters and mopeds.

In addition to Mumbai and Pune, the industrial centres of this region are: Ambarnath, Andheri, Bhandup, Ghatkopar, Hadapsar, Jogeshwari, Kalyan, Kirkee, Kolhapur, Kurla, Nashik, Sholapur, Thane, Trombay, Ulhasnagar, and Vikroli.

This industrial region has almost reached the saturation level. Some of the important problems of this industrial region facing are:

(i) Inadequate supply of power
(ii) Obsolete and outdated machinery

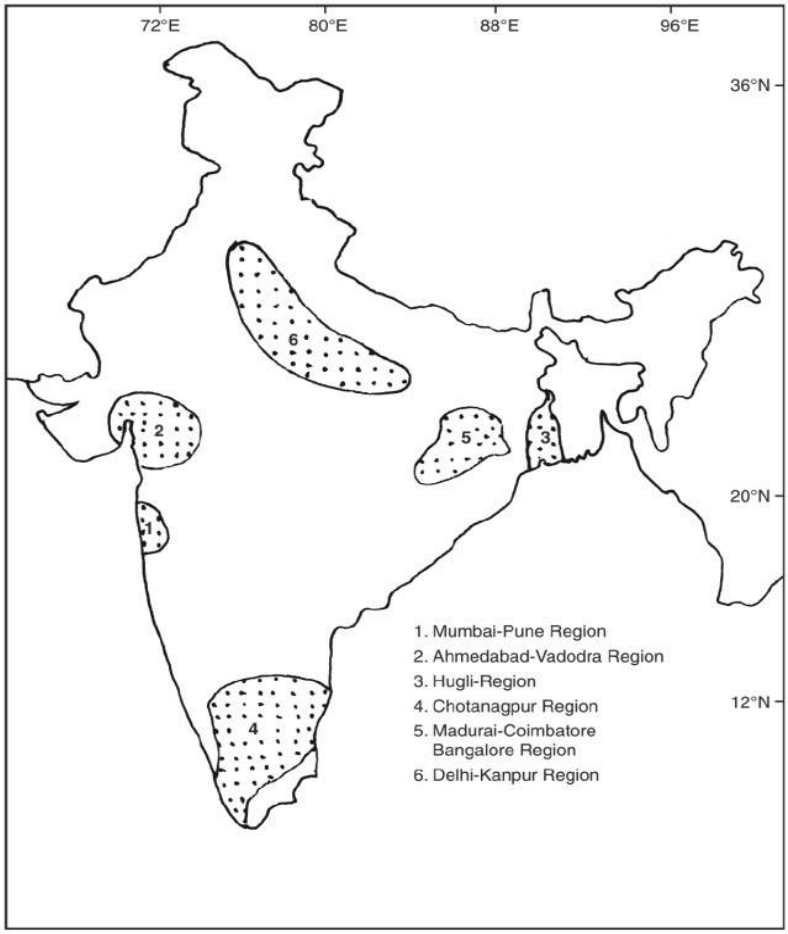

Fig. 11.17 Industrial Regions

(iii) High cost of land and high rent of commercial space
(iv) Labour unrest
(v) Increasing regionalism
(vi) High rate of crime
(vii) Increasing environmental pollution

2. The Kolkata-Hugli Industrial Region

The Kolkata-Hugli industrial region is located along the banks of the Hugli River. The availability of agro-raw material (jute, indigo, and tea), nearness of coal mines (Raniganj and Jharia), abundance of water, cheap labour, and facilities of export are the main factors which helped in the fast growth of this industrial region. Moreover, Kolkata was the capital of British India from 1773 to 1911. Being the capital, Kolkata attracted many of the industrialists to locate their industries in this region.

There are over 10,000 registered industrial factories in this region in which over 20 lakh people are engaged. This belt specialises in the production of jute, silk, cotton textiles, engineering, electrical goods, automobiles, chemicals, pharmaceutical, transport equipments, leather-footwear, iron and steel and food processing, light machine, locomotives, iron and steel, and spare goods for different types of machines.

The main industrial cities and towns of this region are Bansbeia, Naihati, Bhatpara, Kankinara, Jagatdal, Shamnagar, Bhadreshwar, Krishnanagar, Baidyabati, Serampore, Titagarh, Rishira, Konnagar, Agarpara, Baranagar, Ghusuri, Chunchra, Kolkata, Haora, Budge Budge, Bauria, Chengail, and Birlapur.

The main problems of this industrial region are:

1. Paucity of space and traffic jams
2. Shortage of drinking water, insanitation and lack of infrastructural amenities
3. Silting of the Hugli River resulting in the silting of Kolkata port
4. Obsolete machinery
5. Naxalites movement and political unrest
6. Strikes and lockouts
7. Shortage of power supply

In order to overcome these problems the government of West Bengal is pursuing the policy of liberalisation and inviting domestic and foreign entrepreneurs to invest in the region. Some progress has been made in this direction in recent years.

3. The Ahmedabad-Vadodra Industrial Region

This is the third largest industrial region of the country (**Fig. 11.18**). The main cause for the development of this industrial region is the availability of cotton in the hinterland, availability of cheap land, cheap skilled and unskilled labour, port facilities, and nearness of petroleum (Kioli), thermal (Dhuvaran), Hydel (Ukai Project), and nuclear power station (Kakrapara).

There are over 11 thousand registered factories in this region engaging over 15 lakh workers.

It is the second largest cotton textile industrial centre in the country. It also specialises in chemical industries, engineering goods, and pharmaceutical products. Vadodra is an important centre of woollen textile and petrochemical goods. Surat is well known for silk textile and diamond cutting. The other important industrial centres of this region are Anand, Ankleshwar Bhavnagar, Bharuch, Godhra, Himmatnagar, Jamnagar, Kalol, Kheda, Nadiad, Navsri, Rajkot, and Surendernagar.

Scarcity of water and shortage of good quality of cotton are some of the important problems of the region. For the last few years, communal tension has adversely affected the investment in industries in this region.

4. The Madurai-Coimbatore-Bangalore Industrial Region

Stretching over the State of Tamil Nadu and the southern parts of Karnataka is an important industrial centre which made great progress after independence. This region is mainly the cotton producing area of the country. The good climate, disciplined skilled and unskilled labour, regular supply of power (from the Mettur, Papanasam, Pykara, Savitri and Sivasamudram), and the nearness of Chennai, Kochi, Mangalore, and Tuticorin seaports have contributed in the fast development of this industrial region (**Fig. 11.18**).

About 60 per cent of the workers are engaged in the textile industry followed by engineering at 18%, and food-processing at about 12 per cent.

5. The Chotanagpur Industrial Region

This industrial region stretches over Jharkhand, Odisha, southern Bihar, and western parts of West Bengal. Having a large concentration of iron and steel industry, it is often called as the '*Ruhr* of India'. This region is rich in the fossil fuel, and metallic and non-metallic minerals. Power is available from the Damodar Valley Corporation. There is enormous supply of cheap labour from the states of Bihar, Jharkhand, Odisha, Uttar Pradesh, and West Bengal (**Fig. 11.18**).

The main iron and steel producing centres of the region are Asansol, Bokaro, Burnpur, Durgapur, Kulti, Jamshedpur, and Raurkela. The other important industrial centres of the region are Sindri for fertiliser, Chittranjan for locomotives, Khalari for cement, Ranchi for HMT, and Ramgarh and Bhurkunda for glass industry. The main problems of the region are shortage of power supply, and political unrest like those caused by Naxalites. The labour unrest has deterred many of the investors in this region.

6. The Agra-Delhi-Kalka-Saharanpur Industrial Region

This industrial region emerged mainly after independence. Being in and around the national capital and in the vicinity of the Indira Gandhi International Airport it has a more peaceful industrial environment, largely free from the labour unrest and Naxalite movement. It is located in the most productive part of the country providing enough raw material for the agro-based industries. The nearness of market and availability of hydro-power from Bhakra Nangal and thermal power from Badarpur, Faridabad, Harduaganj, and Indraprastha (Delhi) have helped largely in the development of this industrial region.

The main industries of this region are engineering, electronics, chemical, glass, textile, sugar, and food-processing and agricultural machinery (**Fig. 11.18**). The main industrial centres are Agra (textile, tourisms), Ambala (scientific instruments), Chandigarh (electronic and strategic goods), Delhi (textile, chemicals, drugs, pharmaceutical, light machine, electronic goods, food processing), Faridabad (engineering), Ghaziabad (synthetic fibre, chemicals, electronics, pharmaceuticals, agricultural equipments, iron & steel, cycle tyre and tubes), Gurgaon (automobiles), Kalka (HMT), Mathura (petrochemicals), Meerut (sugar and textile), Modinagar (textile, engineering goods, and paper), Modipuram (textiles), Mohannagar (brewery, alcohol), Moradnagar (ordinance), NOIDA (automobile, electronics, etc.), Panipat (textile, chemical and food processing), and Saharanpur (paper, wood-work, sugar, textile and food-processing).

High price of land, traffic jam, and high rate of crimes are the main problems of this region.

Minor Industrial Regions

Apart from the industrial regions described above there are several minor emerging industrial regions in the country. Some of them are as under:

(i) **Kanpur-Lucknow Industrial Region:** Cotton, woollen and jute textiles, leather goods, fertilisers, chemical, drugs, pharmaceuticals, electric goods, and light machinery.

(ii) **Assam Valley Industrial Region:** This region has the industries of petro-chemical, jute and silk textiles, tea-processing industry, paper, plywood, match, and food processing industries. Important industrial centres are: Bongaigaon, Dibrugarh, Digboi, Guwahati, Noonmati, and Tinsukia (**Fig. 11.19**).

(iii) **Darjeeling-Siliguri Industrial Region:** Tea-processing industry and tourism.
(iv) **North Bihar and Eastern Uttar Pradesh Industrial Region**: Sugar, cement, glass, jute, fertilisers, locomotive, paper, and food processing are the main industries of this region. The main industrial centres are Allahabad, Dalmianagar (Bihar), Gorakhpur, Patna, Sultanpur, and Varanasi.
(v) **Indore-Ujjain Industrial Region:** Main industries are cotton textile, chemicals, drugs, electronic and engineering goods, and food processing.
(vi) **Amritsar-Jalandhar-Ludhiana Industrial Region:** Sports goods, cotton and woollen, textiles, hosiery, food-processing, and tourism are the main industries of this region.
(vii) **Nagpur-Wardha Industrial Region:** Textiles, engineering, chemicals, and food processing are the main industries of this region.
(viii) **Godavari-Krishna Delta:** Main industries are iron and steel, ship-building, fertiliser, rice-milling, cotton textile, sugar, fish processing, engineering, and chemicals. Main industrial centres are Guntur, Machlipatnam, Rajamundry, and Vishakhapatnam.
(ix) **Dharwar-Belgaum Industrial Region:** Cotton textile, chemicals, spices packing, and food processing are the main industries.
(x) **Kerala Coast Industrial Region:** Main industries of this region are coconut-oil extraction, rice-milling, fish packing, paper, coir-matting, ship-building (Kochi), petroleum refining (Kochi), and chemical and electronic goods.

MULTINATIONALS

A firm which owns or controls production facilities in more than one country through direct foreign investment is known as a multinational or multinational corporation (MNC). These are also called the Transnational Corporations. During the colonial period, the East India Company, the Dutch East Indonesian Company, the Royal African Company, and the Hudson Bay Company were such multinational companies.

Although multinationals grew most rapidly in the 1960s, the foundations were laid in the inter-war period, notable examples being Ford, Vauxhall, and Phillips. In the mid-1980s, multinationals accounted for 14% of UK employment and 30 per cent of UK exports. The corresponding figures for France were 24% and 32% respectively. Multinationals are made possible by improved international communications which provide rapid containerised transshipment and foreign travel, easy communications of information, and international mobility of capital. When one market is saturated, the multinational can rapidly develop others, since foreign investment cuts transport costs, and makes possible a rapid response to local markets. It also eases tariff barriers. Moreover, multinationals can compare costs at different locations, and can switch activities to different areas as appropriate.

Multinational corporations are probably the major force affecting world wide shifts in economic activity, since the largest MNCs have a turnover greater than the GNP of many less developed countries. Although a developing country may benefit from the construction of a plant for a multinational corporation in terms of jobs and markets, it has been argued that the price is loss of local control.

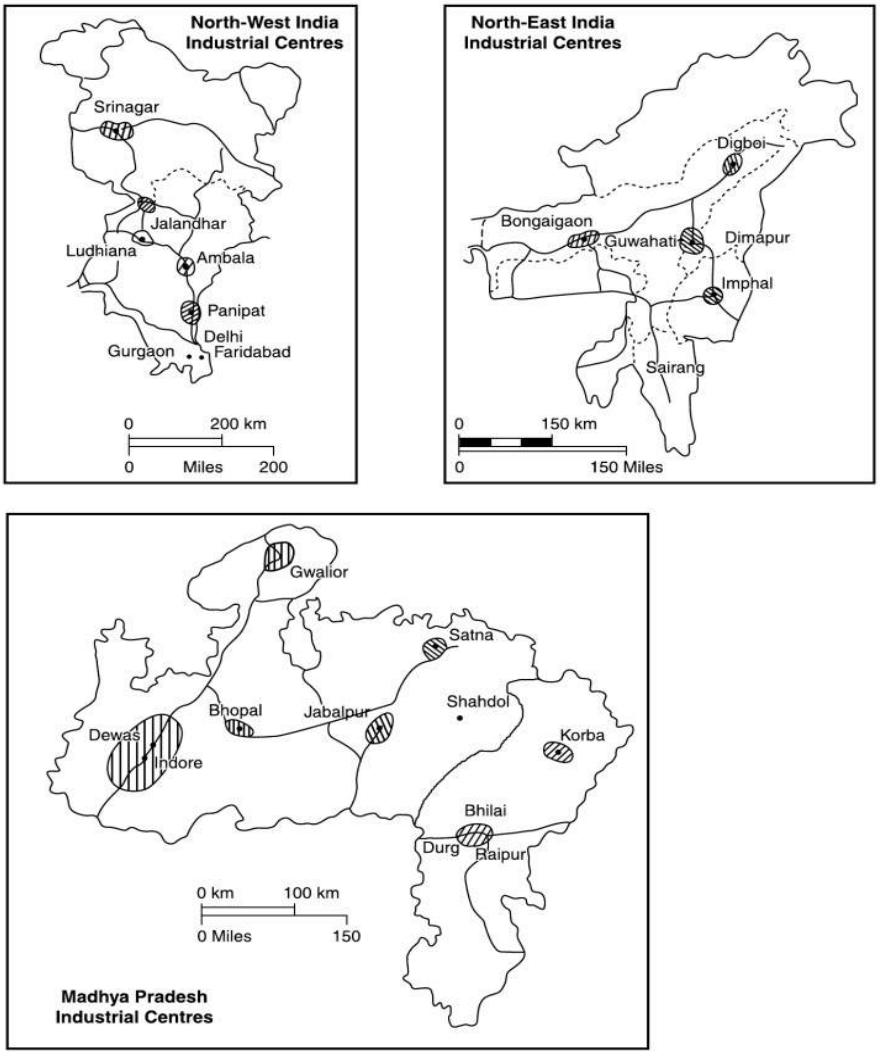

Fig. 11.19 India—Emerging Industrial Regions

Impact of Multinational Corporations

The multinationals have affected the Indian economy, society and ecology favourably and adversely. Some of the important impacts of multinationals have been presented here:

1. **Replacement of Technology:** The obsolete and outdated technology performing below the capacity has been replaced by the latest and more efficient technology by the multinationals.
2. **Damage to Cottage and Small Scale Industries:** The traditional cottage industries as well as small scale industries are not able to compete with the large-scale production of the

multinationals. These industries may disappear completely, unless special steps are taken to promote their interest.

3. **Heavy Remittance Abroad:** According to the Reserve Bank of India, the average rate of profit to the multinationals varies between 20 to 25 per cent. This is a huge profit remitted outside of the country.
4. **Low Foreign Investment:** Most of the foreign subsidiaries have raised financial resources from within India, and the transfer of capital from the parent company has been marginal.
5. **Change in the Initial Activities of the Multinational Corporation:** A number of foreign companies in India are acquiring the character of multi-product and multi-industry enterprises. For example, the Imperial (now India) Tobacco Company (ITC) has diversified its activities to hotel industry, constructing a chain of hotels all over India.
6. **Transfer of Technology—A Myth:** The assumption that the entry of multinational corporation would ensure transfer of latest sophisticated technology to developing countries has not been found valid in practice.

LIBERALISATION

Liberalisation in India is a reform adopted to accelerate the industrial growth and socioeconomic development of the country. The main objective of liberalisation is to permit Indian and foreign entrepreneurs to enter the power, road, and communication as well as in the petroleum sector so that the Central and State governments can lay greater emphasis on the social and economic development programmes. The salient features of the policy of liberelisation are as under:

1. Under liberalisation the new Industrial Policy, July 1991, was adopted to remove the bureaucratic control, which was a barrier in the industrial development of the country. In fact, liberalisation means deregularisation of the industrial sector by cutting down the minimum administrative interference in the operation, instead, letting the market forces operate through the profit motive of the producers and free competition among them to regulate and guide the future development of the sector.
2. Under the policy of liberalisation, the requirement of industrial licensing has been abolished for all industries except for 16 products, namely, (i) aerospace equipments, (ii) alcohol, (iii) asbestos, (iv) chamois leather, (v) coal and lignite, (vi) consumer electric goods, (vii) defence equipments, (viii) electric equipments, (ix) drugs and pharmaceuticals, (x) fur-skin, (xi) hazardous chemicals, (xii) industrial explosives, (xiii) paper and pulp, (xiv) petroleum and natural gas, (xv) plywood, and (xvi) sugar.
3. The liberalisation has opened the economy to direct foreign investment with 51 per cent equity, and started with the process of reducing government subsidies.
4. Abolition of restrictions on most import and export items.
5. Substantial reduction in import tariffs and almost complete removal of restrictions on foreign investments.
6. Disinvestment of shares of public undertakings to reduce government share holding to 51 per cent. This will improve the efficiency of the public sector as the decision-making process will be efficient and prompt.

differentiated economic management like relaxation in certain basic restrictions applicable to the rest of the economy; and free inflow of foreign capital.

Objectives of Special Economic Zone

The main objectives of SEZs are:

(i) To provide a conducive structure to increase foreign and domestic investment in industries.
(ii) To promote foreign trade.
(iii) To generate more employment.
(iv) To develop the relatively less developed areas.
(v) To accelerate the process of industrialisation and urbanisation.
(vi) To reduce the regional inequalities in socioeconomic development.

Historical Perspective

According to Robert C. Hayword, Director World Economic Processing Zones Association the concept of free economic zones dates back to 300 BC. The author notes that such enclaves were found in the Phoenician city of Tyre in the Greek island of Delos. The city became wealthy as a result of such policies and was viewed as a challenger to the centralism of the Roman Empire.

One of the earliest and most famous Special Economic Zones were founded by the government of China under Deng Xiaoping in the early 1960. Following the Chinese example, Special Economic Zones have been established in several countries including Brazil, India, Iran, Jordan, Kazakhstan, Pakistan, Philippines, Poland, Russia, and Ukraine.

Conditions for Ideal SEZ

If the SEZ policy is to provide a real economic impetus especially in the form of creation of world class infrastructure, the minimum size should be 1000 hectares or a minimum investment at Rs.10,000 crore.

Special Economic Zones of India

In order to enhance foreign investment and promote exports from the country and to provide liberal facilities to the foreign and domestic investors, the Special Economic Zones were created in India. The Government of India had in April 2000 announced the introduction of Special Economic Zones policy in the country, deemed to be foreign territory for the purpose of trade operations, duties, and tariffs. As of 2007, more than 500 SEZ have been proposed, 220 of which have been created. India passed Special Economic Zone Act in 2005.

The policy provides for setting up of SEZs in the public, private, joint sector or by state governments. It was also envisaged that some of the existing Export Processing Zones would be converted into Special Economic Zones. Accordingly, the government has converted Export Processing Zones located at: (i) Kandla and Surat in Gujarat, (ii) Cochin (Kerala), Santa Cruz, (Mumbai–Maharashtra), Falta (West Bengal), Chennai, Ilandaikulam, Nanguneri and Tirunelveli (Tamil Nadu), Vishakhapatnam (Andhra Pradesh), NOIDA (Uttar Pradesh), Rajiv Gandhi Info Tech Park, Hinjewadi, Pune-Maharashtra, and Indore (Madhya Pradesh).

At present, India has 81 units in operation in 8 functional SEZs, each with an average of 200 acres. Eight Export Processing Zones (EPZs) have been converted into SEZs. These are fully

The sustenance, prosperity, and development of the private sector and the rest of the economy today is closely dependent on how well the public sector functions. Castigating the public sector, however, is futile. The public sector, thus, has come to stay as an essential component of the economy. What is required is an objective analysis of what ails the public sector in India and the formulation and enforcement of remedial strategy.

Remedial Strategy

The future of a company or a corporation depends upon its profitability. If it has to depend on state subsidisation, its future is bleak.

Firstly, the unit should yield a surplus and profit.

Secondly, the unit should build such a surplus from one year to another. A viable public sector unit should generate a wholesale net annual or periodical surplus to be ploughed partly back towards expansion, modernisation, and development.

The public sector has come to such a sorry pass due to the spread of the unfortunate *civil service culture*. In such a culture, routine, red tape, and financial indiscipline rule at the cost of professionalism and profitability. In the opinion of experts:

(i) There should be freedom from red tapism, and financial and administrative recklessness.
(ii) Such freedom and decision-making levels can be useful and pragmatic only where it is matched by appropriate accountability in terms of productivity and profitability and does not proliferate a civil service culture.
(iii) Bureaucratic inroads into professionalism should be curbed and the reins of public sector should be entrusted to the hands of technologists, economists, and specialists. These experts can improve the viability and profitability of the unit.
(iv) The principle of *autonomy with accountability* is to be followed strictly.

TOURISM

Making a holiday involving an overnight stay away from the normal place of residence is known as tourism. This is in contrast to recreation which involves leisure activities lasting less than twenty-four hours. This holiday may be based on cultural, historic, and social attractions of an urban centre, or on the appeal of different environment.

Tourism is based on the tertiary sector, providing services to the tourists. It is one of the most important emerging industry of India. Tourism in India is an important foreign exchange earner. Tourism not only fetches foreign exchange, it has great potential to provide employment to the trained, skilled, and unskilled workers. Tourism is recognised as a powerful engine for economic growth and employment generating in the country. The contribution of tourism to the country's GDP and total jobs was 5.92 per cent and 9.24 per cent respectively during 2007-08. More importantly, tourism frames massive and continuous flows of people to more and more places of the country which ultimately leads to national integration and promotes international brotherhood.

India, a place of infinite variety, is fascinating with its ancient and complex culture, dazzling contrasts, and breathtaking physical beauty. Tourism in India is growing fast because of its cultural exuberance, and physical diversity. In fact, India is a vast country of great natural beauty and cultural diversity. India has a rich cultural heritage as superbly manifest in many of the architectural wonders like tombs, forts, palaces, temples, mosques, etc. With the great potential available and the

development initiatives taken by the government, inbound tourism has shown a substantial growth in the last two decades. In terms of visitors, at present, India is the 10th among Asia-Pacific countries. India's share in international tourist arrival was 5.6 million in 2010, constituting only 0.50% of the world tourists. The World Travel and Tourism Council has identified India as one of the foremost growth centres in the world in the coming decades. Domestic tourism is estimated to be much higher than that of international tourism which has been rising rapidly.

Tourism in India

In India tourism has emerged as an instrument of employment generation, poverty alleviation and sustainable human development. During 2008–09, direct imployment in the tourism sector was estimated to be over 50 million. Tourism promotes national integration and international understanding and gives support to local handicrafts and cultural activities.

Tourism in India may be examined under the following headings:

1. Nature Tourism and Hill Stations

India has great geographical diversity, which resulted in varieties of nature tourism. Its snow-covered peaks, waterfalls, valleys, gorges, high altitude lakes, and cliffs, provide enough attraction for the nature-loving tourists. India has numerous waterfalls in the Himalayas, Chotanagpur Plateau, and Western Ghats, including Jog Falls (the highest in India). The backwaters of Kerala, hill stations, national parks, natural vegetation in wilderness, and biosphere reserves are also fascinating and attract tourists in large numbers.

2. Hill Stations

The mountainous and hilly areas of India are dotted with places of tourist interest. The most famous hill stations have been shown in **Fig. 11.20**. Several of these hill stations have served as summer capitals of Indian provinces, princely states, or, in the case of Shimla, of British India itself. Since Indian Independence, the role of these hill stations as summer capitals has largely ended, but many hill stations remain popular summer resorts. Most famous hill stations of India are: Almora, Abu, Amarnath, Amarkantak, Chamba, Dalhousie, Darjeeling, Dharamshala, Gangtok, Gulmarg, Kasauli, Kodaikanal, Kullu, Mahabaleshwar, Lavasa, Manali, Matheran (Maharashtra), Mussoorie, Nainital, Ooty (Tamil Nadu), Pahalgam, Panchmarhi, Ranchi, Ranikhet, Shillong, Shimla, Sonmarg, Udhagamandalam, Yeusmarg, etc.

3. Historic Monuments and Archaeological Sites

India has a large cultural heritage. Its cultural, historical, and archaeological centres are of great interest for the domestic and international tourists. Places like Ajanta, Ellora, and some of the important historical monuments like Taj Mahal (one of the seven wonders of the world), Golden Temple, Qutab Minar, Red Fort, Jama Masjid, Humayun's Tomb, Char-Minar, Birla Mandir, the Victoria Terminus (Mumbai), Rashtrapati Bhavan, Gateway of India, India Gate, Lotus Temple (New Delhi), etc., attract a list of tourists.

4. Cultural and Religious Tourism

The main places of cultural tourism have been shown in **Fig. 11.21**. Places of cultural tourism include Allahabad, Ajmer, Amarnath, Ayodhya, Badrinath, Bhadrachalam, Bhubaneshwar, Bodh Gaya, Dwarka, Gangotri, Guwahati, Hardwar, Kanchipuram, Kedarnath, Kochi, Madurai, Mahabalipuram,

beach temples of Mahabalipuram, (vii) beaches of Andaman and Nicobar Islands, (viii) beaches in Mumbai, (ix) Gopalpur (Odisha) (x) beaches of Lakshadweep, and (xi) beaches of Diu.

6. Adventure Tourism

India has enormous potential for adventure tourism. For example: (i) river rafting and kayaking in Himalayas, (ii) mountain climbing in Himalayas, (iii) rock climbing, (iv) skiing in Gulmarg and Auli, (v) boat racing in Kerala, (vi) paragliding in Maharashtra, etc.

Tourism in India has great relevance to regional economic development. Since Independence, Indian tourism, especially the number of foreign tourists, has grown considerably as given in **Table 11.9**.

Table 11.9 *Foreign Tourists in India*

Year	*Number of Foreign tourists*
1951	16,830
1961	140,000
1971	301,000
1981	1,280,000
1991	1,670,000
2001	2,540,000
2010	5,580,000

Source: *India 2012,* p. 147

It may be observed from **Table 11.9** that in 1951 the total number of foreign tourists was only 16,830 which grew to 2,450,000 in 2006, an increase of more than about 150 times. Most of the foreign tourists who visited India were from West European countries (30%), South Asia (26%), North America (20%), South East Asia (6%), East Asia (5%), West Asia (4%), Africa (4%), Australia (3%), and East-European countries (2%).

Problems of Indian Tourism Industry

The tourism industry in India is confronted with many problems: Some of the problems of the tourist industry are given below:

(i) Lack of adequate infrastructure (transport, banking, and hotels)
(ii) Complex visa formalities
(iii) Multiplicity of taxes
(iv) Problem of law and order in some of the regions of the country like Jammu and Kashmir, and the states of North East India
(v) Safety and security of the tourists
(vi) Inadequacy of qualified tourist guides
(vii) Absence of participation of the people

Despite all these shortcomings and problems, India has great potential for tourism development. The World Tourism and Travel Council (WTTC) has estimated that India's travel and tourism potential can provide a substantial resource to economy (Rs. 500,000 crores to GDP) by 2010. The World Tourism and Travel Council has suggested the following four-fold plan of action to achieve the potentials of tourism:

ECO-TOURISM

Eco-tourism, also known as ecological tourism, is a form of tourism that appeals to the ecological and socially-conscious individuals. *Generally, eco-tourism focuses on volunteering, personal growth, and learning new ways to live on the planet, typically involving travel to destinations where flora, fauna, and cultural heritage are primary attractions.*

Much of what goes on in the name of eco-tourism is business as usual, albeit with a few peripheral changes like notices in your room requesting you to re-use the towel. Some visits are called eco-tourism simply because they take tourists to ecologically interesting areas, such as national parks. Most principles of genuinely sensitive tourism, developed internationally over the last years, are ignored.This includes carrying out assessments of the ecological impact of tourism and whether it actually benefits the local people or not.

According to some experts, eco-tourism is responsible tourism. Responsible eco-tourism includes programmes that minimise the negative aspects of conventional tourism on the environment, and enhance the cultural integrity of people. Therefore, in addition to evaluating environmental and cultural factors, an integral part of eco-tourism is in the promotion of recycling, energy efficiency, water conservation, and creation of economic opportunities for the local communities.

Ideally, eco-tourism should satisfy several criteria, such as:

(i) Conservation of biological diversity and cultural diversity through ecosystem protection.
(ii) Promotion of sustainable use of biodiversity, by providing jobs to local populations.
(iii) Sharing of socioeconomic benefits with local communities and indigenous people by having their informed consent and participation in the management of eco-tourism enterprises.
(iv) Tourism to unspoiled natural resources, with minimal impact on the environment being a primary concern.
(v) Minimisation of tourism's own environmental impact.
(vi) Affordability and lack of waste in the form of luxury.
(vii) Local culture, flora and fauna being the main attractions.

For many countries, eco-tourism is not simply a marginal activity to finance protection of the environment but a major industry of the national economy. For example, countries like Costa Rica, Ecuador, Kenya, Madagascar, and Nepal represent eco-tourism as a significant industry adding good revenue to their gross domestic product by playing a major role in their economic activity.

Growth and Development of Eco-tourism

Eco-tourism, responsible tourism, and sustainable development have become prevalent concepts since the late 1980s, and eco-tourism has experienced arguably the fastest growth of all sub sectors in the tourism industry. The popularity represents a change in tourist perceptions, increased environmental awareness, and a desire to explore natural environments. Such changes have become a statement affirming one's social identity, education, sophistication, and disposable income as they are about preserving the Amazon rainforest or the Caribbean coral reef for posterity.

With its great potential for environmental protection, the United Nations celebrated the International Year of Eco-tourism in 2002.

10. The Krisloskars

A highly reputed and amongst the oldest industrial houses in India, this establishment has enough contributions in the areas of heavy and light machine tools industries, with speciality in the areas of locomotion. It is credited to produce the first and the reputed 'diesel pump sets' in the country. It has played an important role in farm mechanisation by producing the 'first' and the most trusted 'tractors' in India. The company produces farm implements also. It has entered the fast-growing automobile industry with Toyota, the second largest car-maker in the world.

11. The Firodias

Being one of the oldest industrial houses of the country, the company has made important contributions in the areas of automobile, two-wheelers, generator sets, etc.

12. The UB Group

This group is amongst the oldest and the leading industrial houses of India with its traditional interest in the alcoholic drinks sector. Of late, it has also started diversifying in the areas such as airlines, infrastructure, hospitality, and real estate segments.

13. The Sarabhais

This is one of the important industrial houses in the country. The company has led the drug and pharmaceutical industries in India with a reputation well-established around the world.

14. The Jagatjit Group

This is amongst the oldest industrial houses of India and its focus remains the liquor industries.

15. The Godrejs

Amongst the top, oldest, and reputed industrial houses of the country, this organisation has contributed in the areas of detergents, refrigeration, almirahs, furniture, air-conditioning, and lock industries providing highest of the standards.

16. The Reliance Group

Though the group is now divided between two brothers, the industrial house is considered a rags-to-riches story, and represents the rise of a new entrepreneurial class in the country. It has paraffin and synthetic yarn as its traditional interests; today it has diversified in more than a dozen traditional and new industrial areas such as power, petroleum, textile, garments, hospitality, telecommunication, pharmaceuticals, software, banking, insurance, etc.

17. The Wipro Group

The doyen of sunrise industries in the country, the group functions in the areas of software development and export including the production of computer peripherals. This is one of the leading companies in the areas of business process outsourcing (BPO) and is also seriously involved in social work. This company is amongst the top names in the software around the world.

conservation-supporting, and environmentally-educated. The tourist industry and governments, however, focus more on the product aspect, treating eco-tourism as equivalent to any sort of tourism based in nature. As a further complication, many terms are used under the rubric of eco-tourism, and others have been used in literature and marketing. Although they are not necessary synonymous with eco-tourism.

The problems associated with defining eco-tourism have led to confusion among tourists and academics alike. Definitional problems are also subject of considerable public controversy, a trend towards the commercialisation of tourism schemes disguised as sustainable, nature-based, and environmentally-friendly eco-tourism. *According to McLaren, these schemes are environmentally destructive, economically exploitative, and culturally insensitive at its worst.* They are also morally disconcerting because they mislead tourists and manipulate their concerns for the environment. The development and success of such large scale, energy intensive and ecologically unsustainable schemes are a testament to the tremendous profits associated with being labelled as eco-tourism.

The Native and Psycho-Social Impact of Eco-tourism

Some of the negative impacts of eco-tourism are:

1. Commercialisation

Eco-tourism is a trend towards commercialisation of tourism throughout the nation. This trend has become one of the fastest growing sectors of tourism industry growing annually 10–15 per cent worldwide. Many of the eco-tourism projects are, however, not meeting these standards. Even if some of the guidelines are being executed, the local communities are still facing other negative impacts. For example, South Africa is reaping significant economic benefits from eco-tourism, but negative effects including physical displacement of persons, gross violation of fundamental rights, and environmental hazards far out weight the medium-term economic benefits.

2. Direct Environmental Impact

Eco-tourism operations typically fail to live up to conservation ideals. It is often overlooked that eco-tourism is a highly concentrated activity, and that environmental conservation is only means to further economic growth.

3. Problem of Garbage and Pollution

Apart from environmental degradation with tourist infrastructure, population pressure from eco-tourism also leaves behind garbage and pollution associated with the Western lifestyle. Although eco-tourists claim to be educationally sophisticated and environmentally concerned, they rarely understand the ecological consequences of their visits and how their day-to-day activities have physical impacts on the environment. The eco-tourists rarely recognise the great consumption of non-renewable energy required to arrive at their destination, which is typically more remote than conventional tourism destinations. For instance, an exotic journey to a place 10,000 km away consumes 100 litres of fuel per person.

4. Impact on Fauna and Flora

The eco-tourists disturb fauna and flora. Eco-tourists believe that because they are only taking pictures and leaving footprints, they keep eco-tourism sites pristine, but even harmless sounding activities such as a nature hike can be ecologically destructive. Where the eco-tourism activity involves wildlife viewing, it can scare away animals, disrupt their feeding and nesting sites.

Now as the economy is going for a process of reforms, many of these problems are being attended by the government with differing levels of success. As the process of economic reforms gets success, we may hope for the success of the industrial complexes in India, too.

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