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Industries – Distribution and Case Studies

Lesson Plan

Contents

- ▶ An overview of the distribution of three major industries
- ▶ Understanding the development and location of Iron and Steel, Cotton Textile and IT industries

Objectives

- ▶ To understand the development of industries based on three case studies
- ▶ To learn about three industries and their location and growth
- ▶ To know the location of these three industries in the world and in India
- ▶ To know the factors affecting industries and how they affect the environment

Chapter-3

Teacher's Aids

- ▶ Globe
- ▶ Pictures, charts, atlas and wall maps
- ▶ Blackboard
- ▶ Internet

Tips for Teacher

- ▶ Explain the factors that help industries develop and locate at certain regions.
- ▶ Explain the growth of industrial centres and cities and their impact on the environment.
- ▶ When dealing with each industry, share pictures and videos about it.
- ▶ Students should be encouraged to know places, locations and their placement on the maps.

Background and Reading

- ▶ Read the lesson aloud and explain, sharing the aids, etc., pausing to examine and explain the data in the boxes.
- ▶ Particularly focus on the factors affecting industry and the processes and impact of industry.

Industry and its Environment

- ▶ Many types of industries—produce variety of goods.
- ▶ Its importance depends on its distribution, its need for the existence and growth of human life.
- ▶ Most important industries in the world—iron and steel, and textile [both older industries] and IT [newly-developing industry].

The Iron and Steel Industry

- ▶ It is found in most parts of the world—major producers: Russia, Japan, USA, China, Germany, France, UK, Canada, India, Brazil, etc.
- ▶ Iron in use for more than 4000 years—early times—mixed with lime and charcoal and heated in a furnace for about 24 hours—results a spongy mass of iron.
- ▶ 20th century: Smelting—a process of obtaining metallic iron from iron ore.
- ▶ Main Inputs: Iron ore, limestone, coal, skilled and semi-skilled labour, a factory with machines, blast furnaces and infrastructure and a large amount of capital.
- ▶ Processes: Smelting iron ore in blast furnaces.
- ▶ Outputs: Steel—widely used as raw material in other industries.
- ▶ Varieties: Melted iron is pig iron—reheated to form cast iron—pig iron reheated to remove impurities, especially carbon, gives wrought iron that is tougher than cast iron.
- ▶ Steel is made by heating pure iron and adding controlled amounts of carbon and ferro-alloys [nickel, chromium, vanadium, etc.] according to the use for which steel is being made—steel is hard, strong and flexible—steel containing 0.4% of carbon is twice as strong as pure iron—as carbon content increases, steel becomes harder but its strength and ductility is reduced.
- ▶ Single blast furnace that can produce about 4 lakh tonnes of pig iron in a year consumes about 10 lakh tonnes of iron ore, 4 lakh tonnes of coking coal and limestone and about 80 lakh cubic metres of water—essential raw materials [iron ore, coking coal, limestone] should be assembled at factory site before loading furnace—equipment used to transform iron into steel by removing impurities is called a converter—molten steel poured into moulds to solidify as ingots of different shapes, sizes and weights.
- ▶ Integrated steel mills—combine on one site smelting iron in blast furnaces, making steel in converters and production of at least some finished products like sheets, pipes, girders, etc.
- ▶ Early 19th century—deciding factors for locating iron and steel mills: Availability of raw materials, power supply and water supply.
- ▶ Later emphasis—coalfield and efficient system of transport.
- ▶ Now—more steel mills near coast or where port facilities available—helps import of iron ore and coking coal from other countries.
- ▶ India's advantages for growth and development of iron and steel industry—adequate and rich quality of iron ore and other raw materials, cheap labour, efficient and well-developed network of transport and a ready market.

- ▶ Main centres–Jamshedpur, Bokaro [Jharkhand]; Burnpur, Durgapur [W. Bengal]; Bhilai [Chhattisgarh]; Raurkela [Odisha]; Bhadravati, Vijaynagar [Karnataka]; Vishakhapatnam [Andhra Pradesh]; Salem [Tamil Nadu]–over 200 mini steel plants–total steel production about one million tonnes in 1947, now about 35 million tonnes.

Tata Steel Ltd., Jamshedpur, India

- ▶ 1947–India had only one steel plant at Jamshedpur–Tata Iron and Steel Company [TISCO]–started in 1907 by Jamsetji Tata–at Sakchi located at confluence of Subarnarekha and Khorkai rivers in erstwhile Bihar now Jharkhand–Sakchi close to Bengal-Nagpur railway line–essential inputs–iron ore, coal, limestone, manganese, etc., available in nearby areas.
- ▶ Iron ore from Odisha and Chhattisgarh, coal from Jharia coalfields–water from Khorkai and Subarnarekha rivers–later established many factories producing heavy automobiles, locomotives, agricultural equipment, machinery, tin-plates, cables, chemicals, etc.–Tata Steels’ products helped development and diversification of large variety of India’s industries–steel basic raw material of many engineering-based industries.
- ▶ Later Jamshedpur became not only important industrial centre but also became famous for technical colleges and scientific research laboratories, especially in metallurgy–Kolkata main market only 250 km from there.

Iron and Steel Industry, Pittsburgh, USA

- ▶ Pittsburgh–Steel Town–Pennsylvania state–located on confluence of Allegheny and Monogahela rivers–Ohio River starts from this confluence–highly accessible from Great Lakes and important trade route between the east and west.
- ▶ Pittsburgh–Lake Erie region has a number of industrial towns–various engineering industries depending on availability of steel from Pittsburgh–Wheeling, Youngstown, Warren, Cleveland, etc.–they also produce steel.
- ▶ Pittsburgh gets iron ore from Mesabi ranges via the Great Lakes; coal from the Northern Appalachian coalfields–steel mill began production in 1924–today most of the steel mills old and closed down–remaining steel mills along river courses–finished products from Pittsburgh taken by land and lake routes to market–railroad equipment, heavy machinery, agricultural implements, rails, military equipment, etc.

The Cotton Textile Industry

- ▶ One of the oldest industries in the world–growth and development closely linked with the Indus Valley civilisation in India and the Egyptian civilisation in the Nile region in Africa.
- ▶ Industrial Revolution in England beginning–centred on the cotton textile industry–started mass production and then spread to other parts of the world.
- ▶ Different fibres for cloth–cotton, jute, flax, wool, silk, rayon, nylon, polyester–fibres are basic raw materials for textile industry–natural [cotton, jute, flax, wool, silk] or man-made [rayon, acrylic, nylon, polyester].
- ▶ Before Industrial Revolution–cloth made by hand–propelled spinning wheels and looms–power looms first used in England.

- ▶ Important producers–India, China, Japan, USA, Russia, Brazil, Italy, etc.
- ▶ India producer of high quality cotton cloth from old times–muslin of Dhaka, calico of Calicut, chintz of Masulipatnam, etc.–made by hand–production was low, cost high.
- ▶ Mill-made cloth of England comparatively cheaper–led to death of handloom industry during British rule in India.
- ▶ Initially textile mills in Maharashtra and Gujarat states–advantage of warm, moist climate, ports for importing machinery, raw material [cotton] and skilled labour available–rapid expansion.
- ▶ Now–most of the initial advantages become secondary–so industries spread to other cities and towns–Kanpur, Indore, Coimbatore, Ludhiana, Amritsar, Puducherry, etc.

At Ahmedabad, India

- ▶ Ahmedabad–located on bank of Sabarmati river, Gujarat–second most important centre of textile industry–called Manchester of India–more than 70 textile mills, many started using man-made fibre.
- ▶ Many favourable factors helped development of the industry–(a) In heart of cotton growing belt of central and western India, so raw material easily available (b) Warm, humid climate ideal for spinning cotton yarn and weaving cloth, so helps to produce superior quality of yarn, some mills have adopted artificial humidifiers (c) Located in extensive flat region, so has adequate amount of level land for expansion of industry (d) Close to densely populated areas of northern India, so ready market available (e) Gujarat and Maharashtra densely populated, so skilled and semi-skilled labour available at comparatively cheap rates (f) Vast network of roads, railways and airports in the surrounding region–helps transport goods all over India (g) Not a port town, but close proximity to Kandla and Mumbai facilitates import of machinery and export of cotton textiles.
- ▶ First cotton textile mill established in 1859–spinning mostly in smaller units–main products–dhotis for men and saris for women–industry suffering now because of old, obsolete machinery, inadequate power supply and high labour costs–the industry needs upgradation of machines based on latest technology.

At Osaka, Japan

- ▶ Osaka – coastal town and one of the busiest ports of Japan – important textile manufacturing centre, called Manchester of Japan – located in midst of the industrial belt of Hanshin, with Osaka, Kobe and Kyoto as important centres.
- ▶ Most of textile industry destroyed during World War II – number of cotton textile mills established to produce textiles at low cost.
- ▶ Growth and development at Osaka due to: (a) Location in a vast plain area along coast ensures availability of land for expansion (b) Warm, humid climate suitable for spinning yarn and weaving cloth (c) Cheap semi-skilled female labour available in surrounding areas (d) Well-developed Osaka port helpful in import of raw cotton and export of finished cloth (e) Yodo river important source of supply of fresh and adequate quantity of water for processing (f) Raw cotton mostly imported from USA, China, India, Egypt, Sudan and Pakistan.

- ▶ Osaka has some very large textile plants and most work related to ginning, spinning, weaving and dyeing done with automatic machines—ensures good quality cloth at low rates—specialisation of one variety of cloth practised.
- ▶ Cotton textile industry facing some problems—some mills closed down, new factories manufacturing iron and steel, machinery, electrical equipment, shipbuilding, cement, automobiles, etc., being established—some now using man-made synthetic fibres.

Information Technology

- ▶ New addition to service industry—also called knowledge-based industry—deals with storage, processing and distribution of information.
- ▶ IT industry—includes services rendered to consumers on computers, radio, television, mobile phones, fax, etc.—most important factor for its growth and development is the computer.
- ▶ Computer first developed in USA in 1946 for defence purposes—helped storing large amount of information on tiny chips.
- ▶ India started late, but made rapid progress in the development of software—helped reducing brain-drain from India to the western world—main factors for growth and development of IT industry in India and the USA are availability of resources, cost of development and infrastructure.

At Bengaluru, India

- ▶ Bengaluru, capital of Karnataka—southern part of the Deccan—called the Silicon Plateau—city has dust-free mild climate almost throughout the year.
- ▶ Many high-tech industries located here—Indian Telephone Industries, Hindustan Aeronautics Ltd., Hindustan Machine Tools, Indian Space Research Organisation, etc. — city has a large population of technically educated people—large number of colleges imparting technical education and training—also a centre of manufacturing and transportation—computer software companies started establishments in 1980s—pioneer Infosys Technologies which developed links with many global companies.
- ▶ Karnataka Government—initiative announced its IT policy in 1992—many multinational companies: Hewlett-Packard, IBM, Siemens, Motorola, Compaq, etc., opened sub-offices or head offices here—about 2 lakh software professionals working in Bengaluru—[computer machines known as hardware; programme used known as software]—now called Silicon Valley of the East.
- ▶ Other state governments also taking initiative to establish IT centres—Mumbai, New Delhi, Hyderabad, Chennai, Gurgaon, Noida, Pune, Chandigarh, Thiruvananthapuram, Kochi, etc.—unique status of Bengaluru with highest availability of management talents.

At the Silicon Valley, USA

- ▶ Located on the San Francisco peninsula, California, USA—part of the Santa Clara County—located next to the Rocky mountains—lies in one of the most industrialised regions of the USA.

- ▶ Area with a mild climate—even winter temperatures never drop below freezing point—enough space for growth and development of the IT industry.
- ▶ Earlier called the Valley of Heart’s Delight—due to large scale production of apricots—first industrial park as a centre for higher technology established here in the 1950s—in collaboration with Stanford University—aim was to find highly placed technology work for the students of the university—main work done by Prof. Fredrick E. Terman of the university—invited computer hardware and software companies to come and establish their units in the park—the industrial and research activities in the Silicon Valley units are concentrating on software and the Internet.
- ▶ Name from silicon chip used in computers—at present over 1 lakh IT professionals and technicians working in companies there—presently computer software and hardware companies located in most of the cities of the USA.
- ▶ This knowledge-based industry can change India’s image and has many advantages compared to other countries too—India has enough skilled manpower and want to use computers to spread information and create awareness.

Assessment Corner

Oral Assignment

- A. Ask for answers at random from the students. Confirm the right answers. Let them write down the correct answers if they like in their books.

Written Assignment

- B–D. The teacher has two options—(i) Either do these exercises orally first and then ask the students to write them down. OR (ii) Ask the students to write the answers on their own. Then the teacher can announce the correct answers to the students and they can ask their partners to cross-check them.

In either case, the answers can be written as homework and the teacher can check them in the class.

Think Tank

- E. **HOTS questions:** Discuss the questions in class and let the students write the answers to E and F as homework. Teacher should assess individual work.