18BGE52C- GEOGRAPHY OF WORLD RESOURCES-UNIT 4

Factors Influencing the Location of Industries: Geographical and Non-Geographical Factor

Geographical Factor

1. Raw Materials
2. Power
3. Labour
4. Transport
5. Market
6. Water
7. Site/Location
8. Climate

Non-Geographical Factor

1. Capital
2. Government policies
3. Industrial Inertia
4. Efficient organisation
5. Banking Faciliti and insurance

Iron and Steel Industry

The primary difference between iron and steel is that the former is a metal, whereas the latter is an alloy. Iron is simply a metal element that occurs naturally on Earth. In comparison, steel is a man-made alloy that's made by mixing iron and carbon together.

Difference between iron and steel?

- Is the percentage of carbon in main ferrous alloy element.
- Those iron contain less than 2% carbon is called steel.
- More than 2% carbon called iron

- Iron is most widely found in the crust of the earth, in the form of various minerals (oxides, hydrated ores, carbonates, sulphides, silicates and so on).
- Steel production is an index of national prosperity and the basis of mass production in many other industries such as shipbuilding, automobiles, construction, machinery, tools, and industrial and domestic equipment.
- iron and steel industry is a reflection of global economy
- America, Western Europe and Japan accounted for nearly two-third of the world’s steel production, mid-1970s

- last century, the growth of steel production in countries like China, South Korea, Brazil and India has changed the entire pattern of steel production in the world.

Production of iron and steel in major countries of the world:

Countries	Production (in crore tons)	
	Pig iron	Crude steel
China	131.23	128.5
Japan	80.5	105.4
USA	47.9	102.0
Russia	43.3	55.5
Germany	27.3	41.7
South Korea	24.8	43.4
Brazil	27.7	27.8
Ukraine	25.7	31.7
India	21.3	26.9
France	13.6	20.0
Italy	10.9	26.6
Great Britain	10.9	16.1

China is having the oldest system of fabricators of iron, as is evident from its historical records. But until the adoption of her five-year plan in 1953, China had only insignificant iron and steel manufacturing of modern type.
Gradually, China has developed the iron and steel industry and now it is the highest producer of iron and steel in the world.
Within a span of 15 years China was able to increase its production of crude steel to 217 percent.

At present, China is having following important areas of iron-steel industry:

(i) Southern Manchuria is the largest steel plant of China at Anshan and other plants at Pensihu and Mukden.
(ii) Shansi is also an old region of iron and steel production. In this region Taiyuan has been developed as a major steel centre.
(iii) The Lower Yangtze Valley: In this region Hankow, Shanghai, Hanyang and Chungking are the main centres of iron and steel industry.
(iv) Other centres are located at Paotow, Chinling Chen, Canton, Singtao and Huangsih.
The growth of iron and steel industry in China has been spectacular. Since 1973, China has increased its production of steel by 220 per cent, although her consumption of steel has also increased more than 300 per cent.

Japan

In spite of the shortage of raw material (iron and coal), Japan has become one of the leading steel producers of the world. After China, Japan is the second largest producer of pig iron and crude steel in the world.
Almost all the iron and steel plants of Japan are situated near tidewater. These steel plants, at or near tidewater, are thus able to draw raw materials from many parts of the world and similarly to ship finished products.
In Japan, large-scale concentration of iron and steel industry has occurred in the following regions:

1. *The Tokyo-Yokohama Region:*
2. *Nagoya Region:*
3. *Osaka-Kobe Region:*
4. *Fukuoka-Yamaguchi Region:*
5. *Oka-Yamaha Region:*
6. *Hokkaido Region:*

USA

Once USA was the highest producer of iron and steel but now its rank is third in the world, next to China and Japan. In the US first iron and steel plant was estab-lished in 1629 at Massachusetts.
During last 380 years or so the US steel industry has undergone through several changes. This change has not only occurred in growth and production pattern but also in localisation pattern.
The major iron and steel regions in the USA are as follows:
(i) Appalachian or Pittsburgh Region
(ii) Lake Region
(iii) Atlantic Seaboard Region
(iv) South Appalachian
(v) Western Region

Russia-Ukraine

Prior to disintegration in 1991, USSR was the leading steel-producing country of the world. Now also Russia and Ukraine are important iron and steel producers of the world. Russia ranks 4th in the production of pig iron and crude steel, while Ukraine stands 8th in world ranking.
In the post-revolution period, the Soviet steel industry had achieved a remarkable expansion. During the Second World War, however, the Soviet iron and steel industry was affected badly.

Most of the large production centres were either destroyed or damaged. However, soon the country recovered and by 1975 became the largest producer of iron and steel in the world.
The four important iron- and steel-producing regions are:
(i) Ural Region
(ii) Kuznetsk or Kuzbas Region
(iii) Moscow Region
(iv) Others

Ukraine

Now, Ukraine is an independent country and has 8th position in world s production of iron and steel. In this region all the raw materials, i.e., iron ore, coal, limestone, manganese are available for steel production.
The main centres of iron and steel plants are Krivoirog, Kerch, Zhdanow, Tagarerog, Zaporozhye, Pittsburgh, Dniepropetrovsk, etc.
Other notable steel-producing centres of independent countries are Tbilisi, Tashkent and Bogovat in Uzbekistan and Tamir Tan in Kazakhstan.

Germany:

After re-unification of East and West Germany in 1990, the country is now one of the leading steel-producing countries in the world and ranks 5th in the world with an annual production of 27.3 crore tons of pig iron and 41.7 crore tons of crude steel.
The most important centre of iron and steel industry in Germany is the Rhenish-Westphalia, contributing more than 80 per cent of the steel produced in Germany, and 85 per cent of pig iron. It manufactures a wide variety of specialities.
Other regions of importance are the Siegerland Hessen-Nassau, Northern and Central Germany, Saxony, and South Germany. The greatest centre is Essen in the Ruhr valley where the world famous works of Krupp are situated.

India has a long history of the use of iron and steel. However, it was only after the first decade of the 20th century that manufacture of iron and steel as a modern industry made a beginning in this country.
It was in 1911 that India's first iron and steel plant – the Tata Iron and Steel Company Ltd. (TISCO) was set up in Jamshedpur in Bihar in private collaboration with a US firm.
Nearly three and a half decades later another plant was launched at Burnpur in neighbouring Bengal — the Indian Iron and Steel Company Ltd. (IISCO) — with British participation.
At the commencement of Five-Year Plans (1951) there were three steel plants located at Jamshedpur, Asansol and Bhadravati. Not only capacity of these plants was increased but six integrated plants in public sector have been established at Durgapur, Rourkela, Bhilai, Bokaro, Vishakhapatnam and Salem,
Apart from these more than 140 mini steel plants have also been set up to meet the growing internal demand. India is having the largest iron ore deposits in the world and also having coal, therefore, having very good prospects of the further growth of iron and steel industry.

SHIP BUILDING INDUSTRY

- There are five major types of natural or man-made ports which are Inland port, fishing port, dry port, warm water port and seaport.
- Among all these types of ports, seaports are the largest and busiest type of ports.
- There is a wide range of materials used in shipbuilding comprising ferrous metals, non-ferrous metals, plastics, GRP (Glass Reinforced Plastics/ fiber glass) and wood.
- The most widely used material in ship building remains steel especially plan carbon or mild steel approximately 90%.
- Shipbuilding is the construction of ships and other floating vessels.
- It normally happens in a specialized facility known as a shipyard.
- Shipbuilding and ship repairs, both commercial and military, are called to as "naval engineering".
- The construction of boats is a similar activity termed as boat building.

Shipbuilding Types

By Product Types:
- Bulkers
- Tankers
- Containers
- Cruise and Ferry
- Others

By Applications:
- Passenger Transportation
- Goods Transportation

Ship Building Countries

- South Korea has the largest market share in the global shipbuilding market, followed by China and Japan.
- The global market share of the Korean shipbuilding industry has reached 34%; the global market share of China's shipbuilding industry is 33%; the global market share of the Japanese shipbuilding industry is 17%.
- In Japan, several reforms have taken place. The global shipbuilding market is expected to grow in future due to increasing seaborne trade and economic growth, rising energy consumption, demand of eco-friendly ships and shipping services, and the advent of robotics in shipbuilding.
- North America (United States, Canada and Mexico)
- Europe (Germany, UK, France, Italy, Russia and Turkey etc.)
- Asia-Pacific (China, Japan, Korea, India, Australia, Indonesia, Thailand, Philippines, Malaysia and Vietnam)
- South America (Brazil, Argentina, Columbia etc.)
- Middle East and Africa (Saudi Arabia, UAE, Egypt, Nigeria and South Africa)

AUTO MOBILE INDUSTRY

- Automobile industry is a symbol of technical marvel by human kind.
- Being one of the fastest growing sectors in the world its dynamic growth phases are explained by nature of competition, product life cycle and consumer demand.
- The production of automobiles in volume began in the early 1890s, in Western Europe.
- The USA started the production of both electric and gas automobiles by 1896 and in 1903, Ford stepped in.
- The great depression and the World Wars saw a drop in sale; but the 1950s and 1960s were the glorious era for automobiles (driven by Ford, GM and Chrysler) producing 11 million units in 1970
- Ford Motor Company's mass-production model from the U.S. to Western Europe and Japan followed both World Wars I and II. This gives rise to two important trends
- The advancements in industrialization led to significant increase in the growth and production of the Japanese and German automotive markets.
- Due to the oil embargo from 1973 to 1974, the export of fuel efficient cars started from Japan to the U.S.
- The world automobile industry is witnessing an unprecedented scale of change from the 1990

Global market leader in automobile industry are

1. Volkswagen AG (16%)
2. Toyota (13%)
3. Daimler (10%)
4. GM (9%)
5. Ford (9%)
6. BMW (6%)
7. Nissan (6%)
8. Honda (6%)
9. Hyundai (5%)
10. SAIC (5%)
11. Peugeot SA (4%)

- Contribution of Automobile industry in Economy o Automobiles are a liberating technology for people around the world.
- The personal automobile allows people to live, work and play in ways that were unimaginable a century ago.

- Automobiles provide access to markets, to doctors, to jobs. Nearly every car trip ends with either an economic transaction or some other benefit to our quality of life.
- If auto manufacturing were a country, it would be the sixth largest economy .
- In 2011-2012, automobile industry contributed about 0.5% to the Australian economy including auto parts manufacturing which is $5.4 billion

Automobile Industry- An employer

- The world's automotive industry made over 75 million cars, vans, trucks and buses .
- These vehicles are essential to the working of the global economy and to the wellbeing of the world's citizens. This level of output is equivalent to a global turnover (gross revenue) of almost €2 trillion.
- Building sixty-six million vehicles requires the employment of more than eight million people directly in making the vehicles and the parts that go into them. This is over five percent of the world's total manufacturing employment.
- In addition to these direct employees, about five times more are employed indirectly in related manufacturing and service provision, such that an estimated more than 50 million people earn their living from cars, trucks, buses and coaches.
- Automobile industry create jobs, jobs and jobs

CHEMICAL INDUSTRY

- The chemical industry comprises the companies that produce industrial chemicals.
- Central to the modern world economy, it converts raw materials (oil, natural gas, air, water, metals, and minerals) into more than 70,000 different products.
- The plastics industry contains some overlap, as some chemical companies produce plastics as well as chemicals.

Product Type	**Examples**
Inorganic industrial	ammonia, chlorine, sodium hydroxide, sulfuric acid, nitric acid
Organic industrial	acrylonitrile, phenol, ethylene oxide, urea

Ceramic products	silica brick, frit
Petrochemicals	ethylene, propylene, benzene, styrene
Agrochemicals	fertilizers, insecticides, herbicides
	polymers, polyethylene, Bakelite, polyester
	elastomers, polyisoprene, neoprene, polyurethane
Oleo chemicals	lard, soybean oil, stearic acid
Explosives	nitroglycerin, ammonium nitrate, nitrocellulose
Fragrances and flavors	benzyl benzoate, coumarin, vanillin
Industrial gases	nitrogen, oxygen, acetylene, nitrous oxide

Locational factors of Chemical Industry depends on

- High degree of industrial development and stable economy.
- The development of science and technology.
- Abundant raw material reserve.
- Steady demand of the products.

Leading Countries are producing Chemicals

1. United States:
2. Russia
3. Japan
4. United Kingdom
5. Italy
6. France
7. China
8. India

This interdependence or symbiotic relationship between the chemical plants forced most of the industrial establishments to settle within the same region. The other reasons responsible for this higher concentration in those states are the presence of nearby market, excellent transport facilities and availability of all kinds of raw materials within their periphery.

COTTON

- Cotton textile industry is quite widespread in the world and as many as 90 countries are producing cotton yarn and/or cloth in varying quantity.
- But the main concentration of textile industry is limited to few countries.
- There are two types of production related with cotton textile, one is the production of cotton yarn and another is the production of cotton cloth.
- Although many countries produce both the items.

Leading producers of cotton yarn in the world

Countries	Production (in lakh metric tons)	Percentage of world production
China	284.0	26.4
India	226.7	21.0
USA	158.8	14.7
Pakistan	115.0	10.7
Indonesia	75.4	7.0
Brazil	40.5	3.8
Turkey	40.0	3.7
South Korea	23.7	1.2.
Italy	21.2	2.0
Egypt	16.4	1.5
Japan	15.8	1.5

Important producers of cotton cloth in the world:

Countries	Production (in' OO million sq metres)	Percentage of world production
China	2256	25.7
India	1250	14.2
Russia	865	9.8
USA	373	4.2
Japan	177	2.0
Germany	90	1.0
Hong Kong	82	0.9
Egypt	61	0.7
France	81	0.9
Romania	54	0.6

WOOL

- Wool is obtained from the fleece of sheep, muskoxen, goats, rabbits, came lids, and other animals that possess long hair.
- The Merino wool fibre is considered the best quality, especially with regards to textile production.
- Animals are normally sheered annually and their fleece is taken to industries for processing.
- The main use of wool is in the production of clothing. However, it is also used to make carpets, upholstery, saddle cloths, and horse rugs.
- In 2016-2017, the top wool producers were Australia, China, the United States, and New Zealand.
- The major wool-producing countries, with the ex-ception of the U.S.S.R. are in the southern continents, where the warmer climates related to the limited southerly extent of the continents, provide better con-ditions for wool production than the damper, cooler conditions of many temperate areas in the northern hemisphere.
- The rather dry climates of interior Aus-tralia and South Africa and the rain-shadow region of Patagonia in Argentina are ideal for wool production.

- Sheep farming on a very extensive scale is often the most economic use of land in the drier regions and in turn extensive production has economies of scale which make for lower-cost production.
- This enables the southern continents to compete with European or North American producers despite the added costs of transporting the wool to the wool manufacturing countries.
- Sheep production for wool in Europe is often a less economic form of land use than the raising of sheep for meat or arable farming.
- Thus Australia (27 per cent), New Zealand (12 per cent), Argentina (6.5 per cent) and South Africa (4 per cent) are the leading wool producers. The U.S.S.R. raises its wool sheep in the semi-arid regions around the Caspian Sea and in Central Asia and accounts for 18 per cent of world wool production.
- Wool is produced not only by these few large-scale producers but also by a very large number of minor producers. Many of the minor producers are in areas where sheep farming has been going on for centuries, such as in Europe, Asia, North Africa and the Middle East.
- These countries, such as Britain, France, Italy, Germany, Spain and Portugal in Europe; Iran, Afghanistan, Iraq, Pakistan, India, Syria and Morocco are not only ancient sheep-rearing areas but also have long-established woollen textile industries.

PAPER AND PULP

- Paper is an important and ubiquitous material, used daily for many purposes worldwide.
- The global production of paper and cardboard stood at 419.72 million metric tons in 2018.
- More than half of that production was attributable to packaging paper, while almost one third was attributable to graphic paper.
- The world's three largest paper producing countries are China, the United States, and Japan.
- These three countries account for more than half of the world’s total paper production, while the leading paper importing and exporting countries are Germany and the United States. The pulp and paper industry consumes a significant amount of water and energy and produces

wastewater with a high concentration of chemical oxygen demand (COD);

- Recent studies underline as an appropriate pre-treatment of the wastewater (e.g. the coagulation) is cost-effective solution for the removal of COD and the reduction of the pressures on the aquatic environment.

World production of Paper and Pulp

Rank 2011	Country	Production in 2011 (1,000 ton)	Share 2011	Rank 2010	Production in 2010 (1,000 ton)
1	China	99,300	24.9%	1	92,599
2	United States	75,083	18.8%	2	75,849
3	Japan	26,627	6.7%	3	27,288
4	Germany	22,698	5.7%	4	23,122
5	Canada	12,112	3.0%	5	12,787
6	South	11,492	2.9%	8	11,120
7	Finland	11,329	2.8%	6	11,789
8	Sweden	11,298	2.8%	7	11,410
9	Brazil	10,159	2.5%	10	9,796
10	Indonesia	10,035	2.5%	9	9,951
	World Total	398,975	100.0%		394,244

MAJOR INDUSTRIAL REGIONS OF THE WORLD

Moscow-Tula region of Russia: an industrial city and the administrative center of Tula Oblast, Russia; it is located 193 kilometers south of Moscow, on the Upa River. The region is rich in iron ore, clay, limestone, and deposits of lignite (coal). It is a prominent industrial center with metalworking, engineering, coalmining, and chemical industries.

Magnitogorsk: is an industrial city in Chelyabinsk Oblast, Russia, located on the eastern side of the extreme southern extent of the Ural Mountains by the Ural River. It was named for the Magnitnaya Mountain that was almost pure iron, a geological anomaly. Huge reserves of iron ore in the area made it a prime location to build a steel plant. The city played an important role during World War II because it supplied much of the steel for the Soviet war machine and its strategic location near the Ural Mountains meant Magnitogorsk was safe from seizure by the German Army.

Donbas of Ukraine (Donets Basin): is a historical, economic and cultural region of eastern Ukraine. A coal mining area since late 19th century, it has become a heavily industrialized territory suffering from urban decay and industrial pollution. The coal mines of Donbas are one of the most hazardous in the world due to enormous working depths (down from 300 to 1200 m) as a result of natural depletion, as well as due to high levels of methane explosion, coal dust explosion and rock burst dangers.

Kuzbass region: located in southwestern Siberia, where the West Siberian Plain meets the South Siberian Mountains. It is one of Russia's most important industrial regions, with some of the world's largest deposits of coal. The south of the region is dominated by metallurgy and the mining industry, as well as mechanical engineering and chemical production.

Great lakes region: The Great Lakes region of North America is a bi-national, Canadian-American region that includes the eight U.S. states of Illinois, Indiana,
Michigan, Minnesota, NewYork, Ohio, Pennsylvania and Wisconsin as well as the Canadian province of Ontario. Navigable terrain, waterways, and ports spurred an unprecedented construction of transportation infrastructure throughout the region. The region is a global leader in advanced manufacturing and research and development, with significant innovations in both production processes and business organization.

Appalachian region: is a 205,000-square-mile region that follows the spine of the Appalachian Mountains from southern New York to northern Mississippi. The Region's economy, once highly dependent on mining, forestry, agriculture, chemical industries, and heavy industry, has become more diversified in recent times, and now includes a variety of manufacturing and service industries. Coal mining is the industry most frequently associated with Appalachia due in part to the fact that the region once produced two-thirds of the nation's coal.

New England: is a region in the northeastern corner of the United States consisting of the six states of Maine, Newhampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. It historically has been an important center of industrial manufacturing and a supplier of natural resource products such as granite, lobster, and codfish. Exports consist mostly of industrial products, including specialized machines and weaponry. About half of the region's exports consist of industrial and commercial machinery, such as computers and electronic and electrical equipment.

Yokohama region of Japan: Yokohama is the capital city of Kanagawa Prefecture and the second largest city in Japan by population after Tokyo. It is a major commercial hub of the Greater Tokyo Area. The city has a strong economic base, especially in the shipping, biotechnology, and semiconductor industries.

Manchurian region of China: is a great industrial hub, with huge coal mines, iron- and steelworks, aluminum-reduction plants, paper mills, and factories making heavy machinery, tractors, locomotives, aircraft, and chemicals. The chief commercial port is Dalian. The great Manchurian plain crossed by the Liao and Songhua rivers, is the only extensively level area. Fertile and densely populated, it has been a major manufacturing and agricultural center of China.

Sao Paulo region: is the largest city in Brazil & is considered the "financial capital of Brazil", as it is the location for the headquarters of many major corporations and the country's most renowned banks and financial institutions. Once a city with a strong industrial character, Sao Paulo's economy has become increasingly based on the tertiary sector, focusing on services and businesses for the country.

Lorraine region of France: is situated in the north east corner of France bordering Germany, Belgium and Luxembourg. This region of France is mostly rich farming country through which the rivers Meuse and Moselle flow, rising onto the forested slopes of the Vosges. The region is known for its iron and steel industry and crystal works.

Ruhr and Silesia of Germany: Ruhr valley is an urban area in North Rhine-Westphalia, Germany. It is Germany's most densely populated region & is known for coal mining and steel industries.

West coast region of Canada: Energy and agriculture are Western Canada's dominant industries – and this region, with only 10 million inhabitants, is one of the world's largest net exporters of both energy and agricultural commodities. Approximate breakdown: Oil (13% of world reserves; 4% of world production) Uranium (8% of world reserves; 20% of world production), Potash (60% of world reserves; 30% of world production), Wheat, coarse grains, oilseeds (21% of the world export market for wheat; 10% for oilseeds)