

## **Minerals**

Minerals provide the material used to make most of the things of industrial- based society; roads, cars, computers, fertilizers, etc. Demand for minerals is increasing worldwide as the population increases and the consumption demands of individual people increase. The mining of earth's natural resources is, therefore accelerating, and it has accompanying environmental consequences. Types of Mineral Resources: Fuel Minerals, Metallic and Non-metallic Minerals:

### **Iron Ore**

Iron ore is the source of primary iron for the world's iron and steel industries. It is therefore essential for the production of steel, which in turn is essential to maintain a strong industrial base. Almost all (98%) iron ore is used in steelmaking. Iron ore is mined in about 50 countries. The seven largest of these producing countries account for about three-quarters of total world production. Australia and Brazil together dominate the world's iron ore exports, each having about one-third of total exports

The iron ore is found in following four types:

**Magnetite:** It is the most important and best kind of iron ore. It contains about 72 percent metallic iron in it. It is black in colour.

**Hematite:** It is also an important source. It contains about 60-70 percent metallic iron in it. It is red and brown in colour. **Limonite:** It contains about 30 to 40 percent metallic iron in it. It is mostly yellow in colour. It is a low-grade iron ore.

**Siderite:** It has more impurities. It contains about 48 percent metallic iron content in it. It is brown in colour. It contains a mixture of iron and carbon. It is a low-grade iron ore.

**Distribution of Iron ore across the world** Iron ore is widely distributed around the world. China is the world's largest producer of iron ore followed by Brazil and Australia at the second and third position respectively.

Majority of the world's total reserves of iron ore of 3, 20,000 million tonnes is located in North America, Russia, United Kingdom, Brazil, South Africa and India.

## **Russia**

It has one of the largest proven reserves of iron ore. Important iron-producing regions of Russia are the Ural region, Kuzbas region in Siberia, Angara and Krasnoyarsk.

## **Ukraine**

Good quality ore with high iron content is found in Kirvoij Rog region of Southern Ukraine, Kursk Magnetic Anomaly (KMA) and Kerch peninsula.

## **Europe**

Sweden is an important region where good quality iron ore is found. Major areas of iron-ore mining in Sweden include Kiruna, Gallivare and Danmora. Another important region is Lorraine in France. Apart from this, Normandy, Pyrenees, Selsia and Phalia region of Germany, and Cleveland, Midland and Scotland region of United Kingdom are major mining ore areas of Europe.

## **North America**

The major iron ore mining areas are the Lake Superior region including Mesabi, Vermillion, Marquette, Cuyana, Manomimi and Gogebic; Alabama state including the Birmingham and Red Mountain region of South Applatians; and in Canada including the Wright, Sept Isles and Schefferville regions.

## **South America**

Brazil is known for its one of the largest reserves of iron ore in the world. Other important regions of iron ore mining are Orinoco Valley of Venezuela and La Sarena area of Chile.

## **Africa**

The major iron ore mining areas of Africa are Liberia, South Africa, Algeria, Morocco and Tunisia. The iron and steel industry of Africa is still under-developed. As a result, most of the iron is exported.

## **Australia**

Pilbara region, Mt. Goldsworthy, Mt. Tom Price, Mt. Newman, Tailoring peak, Kalanooka region, Queensland, New South Wales and Tasmania are important iron ore bearing areas of Australia.

## **Asia**

China has large iron ore reserves in Shenyang region of Manchuria; Muhar and Tahyeh region of Xinjiang valley. The Philippines has also good quality iron ore deposits in Mindanao.

## **Distribution of Iron Ore in India**

India is one of the richest countries of the world in iron ore deposits, particularly the hematite ore. According to the latest Indian Year Book, 95 percent of the hematite resources are distributed in Odisha, Jharkhand, Karnataka and Goa. Magnetite resources are estimated at around 10,619 million tons out of which only 59 million tons is situated mainly in Goa, Rajasthan and Jharkhand. The rest 10,560 million tons or the 99 percent of the magnetite resource is in 'Remaining Resources' category which is mainly found in Karnataka (74 percent) and Andhra Pradesh (14 percent).

## **Copper**

Copper is found in every continent and produced in more than 40 countries of the world.

- **Area distribution:** Copper ore resources are abundant in the world, and mainly distributed in North America, Latin America and central Africa.
- **Country distribution:** In the world, copper resources are mainly concentrated in Chile, the United States, Zambia, Russia and Peru. Chile is the country with the richest copper resources in the world, its copper metal reserves accounting for around 29% of the worldwide total. At the same time, Chile is the world's largest copper producer and exporter.

## **Manganese**

Manganese is a chemical element with the symbol Mn and atomic number 25. It is not found as a free element in nature, it is often found in minerals in combination with iron. Manganese

is a transition metal with a multifaceted array of industrial alloy uses, particularly in stainless steels.

Manganese phosphating is used for rust and corrosion prevention on steel. Ionized manganese is used industrially as pigments of various colors, which depend on the oxidation state of the ions. The permanganates of alkali and alkaline earth metals are powerful oxidizers. Manganese dioxide is used as the cathode (electron acceptor) material in zinccarbon and alkaline batteries.

### **China:**

China now emerged as a highest manganese-producing country in the world. Its production in 2007 was 3,16,500 metric tons which was 21.6 per cent of the total world production. The major manganese-producing areas of China are Kiangsi, Hunan, Kuangsi, Kwangtung, Kuangsi and Kwichou.

Kazakhstan: It is the second largest producer of manganese in the world. Its production in 2007 was 23, 69,000 metric tons, which was 16.2 per cent of the world production.

South Africa: It produces about 1.62 million tons of manganese annually. It ranks third in the world and its share is 11 per cent in the world manganese production. The important manganese-producing area of South Africa is the Cape Province where Krugersdorp, Postonaburg, Manganore are the major mining areas. Australia: The manganese production of Australia is 7.6 per cent of the total world production. The manganese-producing areas are located in Leonara, Victoria, Queensland and Woodie

### **India:**

Although India ranks 8th in the production of manganese in the world, but its reserves are of considerable importance because it possesses the largest manganese reserves in the world. At present, manganese is produced in Odisha, Madhya Pradesh, Chhattisgarh, Maharashtra, Jharkhand, Andhra Pradesh and Karnataka. It produced nearly 4.7 per cent manganese output of the world. The main manganese reserves exist in a 1,250 km long belt stretching from Vadodara (Gujarat) in the west to the Damodar valley (Jharkhand) in the east.

### **Mica**

- Mica is a naturally occurring non-metallic mineral that is based on a collection of silicates.
- Mica is a very good insulator that has a wide range of applications in electrical and electronics industry.
- It can withstand high voltage and has low power loss factor.
- It is used in toothpaste and cosmetics because of its glittery appearance. It also acts as a mild abrasive in toothpaste.
- **India** is one of the foremost suppliers of mica to the world. Mica-bearing igneous rocks occur in AP, Bihar, Jharkhand, Maharashtra,

#### **Major Reserves in India:**

- Andhra Pradesh (41 per cent)
- Rajasthan (21 per cent)
- Odisha (20 per cent)
- Maharashtra (15 per cent)
- Bihar (2 per cent)
- Jharkhand (Less than 1 per cent)

#### **Exports**

- India is the largest exporter of mica.
- Certain grades of Indian mica are and will remain vital to the world's electrical industries.
- Major exports are carried out through Kolkata and Vishakhapatnam ports.
- Important imports of Indian mica are Japan (19%), the USA (17%), U.K, etc.

### **Iron and Steel Industries**

#### **World's Major Industries**

Yes, there are lot many industries, and it is not possible to analyze location details of all. So we are limiting this post on the world's major industries (article courtesy: NCERT). Our focus is on three major industries in the world, but aspirants are advised to go through other industries like petroleum, fertilizers, automobile, pharmaceuticals, sugar etc too.

The world's major industries are:

1. Iron and steel industry – Germany, USA, China, Japan and Russia.
2. Textile industry – India, Hong Kong, South Korea, Japan and Taiwan.
3. Information technology industry – Silicon Valley of Central California and the Bangalore region of India.

The iron and steel and textile industry are the older industries while information technology is an emerging industry.

### **Factors influencing the locations of Iron and steel industries:**

- Raw material: Mostly large integrated steel plants are located close to source of raw materials, as they use large quantity of heavy and weight losing raw materials. Eg: Concentration of Iron and steel industry in Chota Nagpur region-Presence of Iron ore in this region. TISCO at Jamshedpur.
- Markets: As its heavy & bulky transportation cost is high. Therefore nearness to market is important especially for mini steel plants access to nearby markets is most important in order to minimize transportation cost. Also as mini steel plants rely on scrap metal they are mostly present in Maharashtra. Visakhapatnam steel plant located near the coast has excellent import-export facility
- Labour: Availability of cheap labour is also important. Eg: Rourkhela plant, Orisa; Bhilai steel plant in Chattisgarh, mostly in Chota Nagpur region

## **India**

The iron and steel industries are among the most important industries in India. India replaces Japan as second top steel producer in January, 2019. As per worldsteel, India's crude steel production in 2018 was at 106.5 MT, 4.9% increase from 101.5 MT in 2017, and means that India has replaced Japan as world second largest steel production country. Japan produced 104.3 MT in year 2018, decrease of 0.3% compared to year 2017. Industry produced 82.68 million tons of total finished steel and 9.7 million tons of raw iron. Most iron and steel in India is produced from iron ore.<sup>[2]</sup>

Policy for the sector is governed by the Indian Ministry of Steel, which concerns itself with coordinating and planning the growth and development of the iron and steel industry, both in the public and private sectors; formulation of policies with respect to production, pricing, distribution, import and export of iron and steel, Ferro alloys and refractories; and the development of input industries relating to iron ore, manganese ore, chrome ore and refractories etc., required mainly by the steel industry.

There are more than 50 iron and steel industries in India. Given below are major steel plants:

<b>Name</b>	<b>Location</b>	<b>Operator</b>
Alloy Steel Plant	Durgapur, West Bengal	SAIL
Bhilai Steel Plant	Bhilai, Chhattisgarh	SAIL
Bokaro Steel Plant	Bokaro, Jharkhand	SAIL
Chandrapur Ferro Alloy Plant	Chandrapur, Maharashtra	SAIL
Durgapur Steel Plant	Durgapur, West Bengal	SAIL
Essar Steel India Limited	Hazira, Gujarat	ArcelorMittal Nippon Steel India
IISCO Steel Plant	Asansol, West Bengal	SAIL
Jindal Steel and Power Limited	Raigarh, Chhattisgarh	Jindal Steel and Power

Jindal Steel and Power Limited	Angul, Odisha	Jindal Steel and Power
JSW Steel	Hospet, Bellary, Karnataka	JSW Steel
JSW Steel	Tarapur, Boisar, Maharashtra	JSW Steel
JSW Steel	Dharamtar, Maharashtra	JSW Steel
Rourkela Steel Plant	Rourkela, Odisha	SAIL
Salem Steel Plant	Salem, Tamil Nadu	SAIL
Tata Steel Limited	Jamshedpur, Jharkhand	Tata Steel
Tata Steel Limited	Kalinganagar, Odisha	Tata Steel
Visakhapatnam Steel Plant	Visakhapatnam, Andhra Pradesh	Rashtriya Ispat Nigam Limited
Visvesvaraya Iron and Steel Plant	Bhadravati, Karnataka	SAIL

The iron and steel industry in India is organised into three categories: main producers, other major producers, and secondary producers. In 2004-05, the main producers i.e. SAIL, TISCO and RINL had a combined capacity of around 50% of India's total steel production capacity and production. The other major producers — ESSAR, ISPAT and JVSL — account for around 20% of the total steel production capacity.



National steel policy – 2005 has the long-term goal of having a modern and efficient steel industry of world standards in India. The focus is to achieve global competitiveness not only in terms of cost, quality, and product-mix but also in terms of global benchmarks of efficiency and productivity. The Policy aims to achieve over 100 million metric tonnes of steel per year by 2019-20 from the 2004-05 level of 38 mt. This implies an annual growth of around 7.3% per year from 2004-5 onward.

The strategic goal above is justified because steel consumption in the world, around 1000 million metric tonnes in 2004, is expected to grow at 3.0% per annum to reach 1,395 million metric tonnes in 2015, compared to 2% per annum in the past fifteen years. China will continue to have a dominant share of the demand for world steel. Domestically, the growth rate of steel production over the past fifteen years was 7.0% per annum. The projected rate of 7.3% per annum in India compares well with the projected national income growth rate of 7-8% per annum, given an income elasticity of steel consumption of around

Subsequent steel policies have been drafted each year. The Indian Ministry of Steel has released draft National Steel Policy (NSP), 2017. The problems identified in this sector include:

- Steel companies are plagued with huge debts.
- Lack of domestic demand. This is a major concern
- Low quality of metallurgical coke for blast furnace iron making.
- High input costs.
- Cheap imports from China, Korea and other countries are also a matter of concern for domestic producers.

The aim of the draft NSP is to develop a self-sufficient steel industry that is globally competitive. The policy proposes setting up Greenfield Steel Plants along the Indian coastline under the Sagarmala Project.

This has been proposed in order to tap cheap imported raw materials such as coking coal and export the output without incurring huge cost burden. The policy has also proposed the idea of gas-based steel plants and use of electric furnaces in order to bring down the use of coking coal in blast furnaces. The policy targets to achieve production of 300 million tonnes by 2030-31.

**Some of the major problems faced by Indian iron and steel industry are as follows:**

- Capital: ...
- Lack of Technology: ...
- Low Productivity: ...
- Inefficiency of public **sector** units: ...
- Low potential utilisation: ...
- Heavy demand: ...
- Shortage of metallurgical coal: ...
- Inferior quality of products:

## **Cotton Textile Industry**

### **Background**

- India's textiles sector is one of the oldest industries in Indian economy dating back to the 19th century.
- The Indian textiles industry is extremely varied, with the hand-spun and hand-woven textiles sectors at one end of the spectrum and the capital-intensive sophisticated mills sector at the other end of the spectrum.
- The sector caters to a wide range of segments ranging from traditional handloom products to cotton, wool and silk products and has products that vary across natural & man-made fiber, yarn and apparel.

Weaving cloth from yarn is an ancient art. Cotton, wool, silk, jute, flax have been used for making cloth. The textile industry can be divided on the basis of raw materials used in them. Fibres are the raw material of textile industry. Fibres can be natural or man-made. Natural fibres are obtained from wool, silk, cotton, linen and jute. Man-made fibres include nylon, polyester, acrylic and rayon. The cotton textile industry is one of the oldest industries in the world. Till the industrial revolution in the 18th century, cotton cloth was made using hand spinning techniques (wheels) and looms. In 18th century power looms facilitated the

development of cotton textile industry, first in Britain and later in other parts of the world. Today India, China, Japan and the USA are important producers of cotton textiles.

## OSAKA-JAPAN

It is an important textile centre of Japan, also known as the 'Manchester of Japan'. The textile industry developed in Osaka due to several geographical factors. The extensive plain around Osaka ensured that land was easily available for the growth of cotton mills. Warm humid climate is well suited to spinning and weaving. The river Yodo provides sufficient water for the mills. Labour is easily available. Location of port facilitates import of raw cotton and for exporting textiles. The textile industry at Osaka depends completely upon imported raw materials. Cotton is imported from Egypt, India, China and USA. The finished product is mostly exported and has a good market due to good quality and low price. Though it is one of the important textile cities in the country, of late, the cotton textile industry of Osaka has been replaced by other industries, such as iron and steel, machinery, shipbuilding, automobiles, electrical equipment and cement.

## **India**

India has a glorious tradition of producing excellent quality cotton textiles. Before the British rule, Indian hand spun and hand woven cloth already had a wide market. The Muslins of Dhaka, Chintzes of Masulipatnam, Calicos of Calicut and Gold-wrought cotton of Burhanpur, Surat and Vadodara were known worldwide for their quality and design. But the production of hand woven cotton textile was expensive and time consuming. Hence, traditional cotton textile industry could not face the competition from the new textile mills of the West, which produced cheap and good quality fabrics through mechanized industrial units.

## **Mumbai**

The first successful mechanized textile mill was established in Mumbai in 1854. The warm, moist climate, a port for importing machinery, availability of raw material and skilled labour

resulted in rapid expansion of the industry in the region. Initially this industry flourished in the states of Maharashtra and Gujarat because of favourable humid climate. But today, humidity can be created artificially, and raw cotton is a pure and not weight losing raw material, so this industry has spread to other parts of India. Coimbatore, Kanpur, Chennai, Ahmedabad, Mumbai, Kolkata, Ludhiana, Puducherry and Panipat are some of the other important centres.

### **Ahmedabad**

It is located in Gujarat on the banks of the Sabarmati river. The first mill was established in 1859. It soon became the second largest textile city of India, after Mumbai. Ahmedabad was therefore often referred to as the 'Manchester of India'. Favourable locational factors were responsible for the development of the textile industry in Ahmedabad. Ahmedabad is situated very close to cotton growing area. This ensures easy availability of raw material. The climate is ideal for spinning and weaving. The flat terrain and easy availability of land is suitable for the establishment of the mills. The densely populated states of Gujarat and Maharashtra provide both skilled and semi-skilled labour. Well-developed road and railway network permits easy transportation of textiles to different parts of the country, thus providing easy access to the market. Mumbai port nearby facilitates import of machinery and export of cotton textiles

### **Status of Indian Textile Industry**

- The textile industry covers around 4.5 crore workers including 35.22 lakh handloom workers all over the country.
- As per India Brand Equity Foundation, the production of raw cotton in India is estimated to have reached USD 36.1 million bales in FY19, which plays a crucial role in the textile industry to flourish.
- Indian Textile industry contributes to 7 per cent of industrial output in terms of value, 2 per cent of India's GDP and to 15 per cent of country's export earnings.
- India is the second largest producer and exporter of cotton in the world at \$6.3 billion which is marginally close to China.

### **Importance of Textile Industry to India**

- The close linkage of the textile industry to agriculture for raw materials such as cotton has helped the growth of both the sectors and contributing to Indian economy.
- The ancient culture and traditions of the country in terms of textiles make the Indian textiles sector unique in comparison to the industries of other countries.
- The industry is capable of producing a wide variety of products suitable to different market segments, both within India and across the world.
- The demand for textiles can be increased by penetration of organized retail, favourable demographics.
- The textile industry in India has large and diversified segments that in-turn enable businesses and end-consumers to choose from a wide array of products.
- The availability of highly skilled manpower provides a suitable platform for the textile industry to have an upper hand as compared to its counterparts.
- There is a huge potential in the domestic and international markets that will help the industry tackle any possible headwinds in the coming decade.
- The incomparable employment potential owing to the presence of the entire value chain from fibre to apparel manufacturing within the country is an inherent and unique strength of the industry.
- It promotes buyer-driven value chains where large retailers, marketers and branded manufacturers play the pivotal roles in setting up decentralized production networks in a variety of exporting countries, typically located in developing countries.

### **Challenges faced by Indian Textile Industry**

- Highly fragmentation and domination by the unorganized sector and small and medium industries poses a serious challenge to the Indian textile industry.
- The continuous and ill-planned changes in the government policies at the state and central government levels also add to the problem faced by the industry.
- The introduction of new tax structure under GST (Goods and Service Tax) makes the garments expensive.
- Another serious threat to the industry is the raising interest rates and labor wages and workers' salaries.
- The industry faces a lack of access to the latest technology and fails to meet the global standards in the highly competitive export market.

- The fierce competition from China, Bangladesh and Sri Lanka in the low price garment market.
- The tariff and non-tariff barriers coupled with quota in the global market are posing major challenges to the Indian textile Industry.
- The environmental and social issues like child labor and personal safety norms are also some of the challenges for the textile industry in India.

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