

### GEOGRAPHY – MODULE 3.3

#### **Mineral resources, localities, industrial scenario of India, factors and spatial patterns - major industries, industrial regions**

#### **MINERAL RESOURCES**

- Richness in mineral resources.
- Over 20,000 known mineral deposits and more than 60 recoverable resources – explored.
- Eleven states – 90% total number – operational mines.
- Andhra Pradesh, Maharashtra, Orissa, Chhattisgarh, Jharkhand, west Bengal, Tamilnadu, Gujarat, Madhya Pradesh, Rajasthan, Karnataka.

Chota Nagpur Belt	Northern Plateau Region	Kyanite reserves – 100% Iron ore – 93% Coal – 84% Chromite – 70%
Himalayan Belt		Poor in metallic minerals
Indian Ocean	Arabian Sea and Bay of Bengal.	Mineral oil and natural gas in Arabian Sea and Bay of Bengal. Contains poly metallic nodules. Phosphate, manganese, barium, silicon, iron, aluminum.
Midland Belt	Jharkhand, Odisha, Madhya Pradesh, Maharashtra, Andhra Pradesh.	Rich in manganese, bauxite, copper, graphite, mica, lignite, marble, limestone. Jharkhand, Odisha, Madhya Pradesh, Maharashtra, Andhra Pradesh.
Western Belt	Maharashtra, Gujarat, Rajasthan	Nonferrous metals. Maharashtra, Gujarat, Rajasthan - Sandstone, marble, granite, fullers, gypsum. Oil resources and granaries in Mumbai coast.
South Western Belt	Goa, Karnataka, Kerala	Rich iron ore deposit. Goa – iron ore deposit. Kerala – thorium, Mozart, bauxite clay.

#### **INDUSTRIES IN INDIA**

- India is an attractive hub for foreign investment in manufacturing sector.
- The major industries in Indian economy – Iron and steel, textiles, jute, sugar, cement, paper, petrochemicals, automobiles, information and technology, etc.

## COAL INDUSTRY

- 97% of coal reserves at river basin – Godavari, Mahanadi, Son, Damodar.
- Significant coal mining centres – Madhya Pradesh, Raniganj, Jharia, Bokaro.
- Largest coal producing firms in India – Singareni Collieries.
- Metallurgical or cooking coal – grade of coal.
- Used to produce good quality coke.
- Coke – an essential fuel and reactant in blast furnace process for primary steel making.
- Demand for Metallurgical or cooking coal is higher than demand for steel.
- Cooking coal is required for:
  - To remove oxide part from the iron ore.
  - Blend the iron ore with carbon dioxide, for the above process.
- Cooking coal comprises high carbon density as compared to lignite.
- Variety of coal is suitable for heating.

## IRON INDUSTRIES

- There are four types of iron:

Manganite	Used in electronic industries – 70% iron.
Hematite	Second largest producer of this ore – India. First position – Russia.
Limonite	Used in paint manufacturing industries – 50% iron.
Siderite	Mix of magnesium and manganese.

- Iron reserves are found in – Maharashtra, Jharkhand, Chhattisgarh, Odisha, Goa, Karnataka, Andhra Pradesh, Telangana, Tamilnadu.
- Kudremukh mines – in Western Ghats – export iron ores to foreign countries – largest in worldwide.

## STEEL INDUSTRIES

- Jharkhand – Jamshedpur TISCO, Bokaro.
- Chhattisgarh – Bhilai
- Odisha – Rourkela
- Karnataka – Vishweshwaraya
- Andhra Pradesh – Vishakapattanam
- West Bengal – Durgapur, Burnpur
- Tamilnadu – Salem.

Petroleum	<p>Extracted from sedimentary rocks.</p> <p>Major producing unit in India – Digboi in Assam.</p> <p>Major fields – Ankleshwar, Gujarat, Navagam, Lunej, Kosaniba.</p> <p>Found in the basins of Godavari, Krishna, Kaveri.</p> <p>Twenty-two – refineries in India.</p> <p>Major locations of Petroleum deposits – KG basin, Saurashtra Shelf, Brahmaputra shelf, Bengal, Bangladesh shelf.</p>
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Natural Gas	<p>Exercise wide usage in petrochemical industries as natural and compressed raw material.</p> <p>Environmentally friendly resources.</p> <p>Low traces of carbon dioxide.</p> <p>Found in Godavari – Krishna basin.</p> <p>1700km gas pipeline runs between Mumbai High and Bassein in the West and northern India.</p> <p>1984 – Gas Authority of India – set up to monitor the resources of natural gas in this country.</p> <p>Ethane, methane, propane, butane, hydrogen sulphide – contributors to natural gas.</p> <p>propane, butane – used in LPG.</p> <p>Tight gas sands are present deep within the sedimentary rocks.</p> <p>TAPI – natural pipeline stretching across four countries – Turkmenistan – Afghanistan – Pakistan – India.</p> <p>IPA – natural gas pipeline covering three nations – Iran, Pakistan, India.</p> <p>Government of India- proposed to install new natural gas pipeline between Iran, India, Russia, central Asia.</p>
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### NUCLEAR ENERGY RESOURCES IN INDIA

- Uranium and thorium.
- Districts that contain nuclear energy sources – Dhaiwarrocks, Singhbhum, Alwar, Jhunjhuru, Bhandara, Kullu, etc.
- Key source of thorium – Tamilnadu.
- Atomic Energy Commission – 1948 – regulates the production of Uranium and thorium in the country.
- Major nuclear power plants in India- Narora – UP, Kalpakkam – Tamilnadu, Kota – Rajasthan, Kakapara – Gujarat, Kaiga – Karnataka.

Biogas	<p>Key consumers – rural areas.</p> <p>Composed with – human and animal waste, shrubs, farm waste.</p> <p>Rich source off natural manure.</p> <p>Efficient source for domestic and agricultural uses.</p> <p>Gobar Gas – is famous.</p>
Manganese	<p>Odisha – heart of manganese.</p> <p>Manganese producing states – Karnataka, Jharkhand, Madhya Pradesh, Maharashtra, etc.</p> <p>To manufacture steel and ferromanganese ally.</p> <p>Manganese plants are located far from steel plants.</p>
Copper	<p>Jharkhand, Rajasthan, Andhra Pradesh, Karnataka, Madhya Pradesh.</p> <p>India imports most of the premium quality copper – ballerina copper – from abroad.</p> <p>One ton of copper require – total 1400KW of energy.</p> <p>Power plants are located – Lonavala and Hyderabad recycle scrap copper.</p>

	<p>Overall yield is low in India. Copper smelting leads to air pollution due to the release of Sulphur dioxide gas.</p>
Mica	<p>Odisha, Koderma – largest manganese producer in the world. Andhra Pradesh – produce substantial amount of Mica in India. Karnataka, West Bengal and Kerala – produce large amount of Mica. Rajasthan – districts of Jaipur, Udaipur, Bhilwara – produce Mica. Excellent insulating and resistant properties against high voltage. Beaten or spread into sheets. Jharkhand – mica belt- 150km long and 22 km wide. Stretches – Hazaribagh plateau.</p>
Bauxite	<p>Leading producer – Odisha. States – Gujarat, Madhya Pradesh, Jharkhand. Found in laterite rocks in hills and plateau. Useful for the manufacture of aluminum.</p>
Aluminum Bauxite Refining	<p>Aluminum is wide and bauxite is extracted from remote locations. Bauxite is crushed, blended with caustic soda to remove impurities. Blend is then kept for drying to remove moisture.</p>
Lead and Zinc	<p>The ores are produced and refined through the process of smelting and electrolysis. Ores are mixed with water, oil, chemicals for processing. India doesn't have sufficient lead and zinc. Imported from foreign countries. Lead belts in India – Jharkhand, Andhra Pradesh. Zinc belt in India – Rajasthan, Kerala.</p>

## ALUMINIUM INDUSTRIES

- Uttar Pradesh – Hindalco – Birla
- Odisha – Hirakud – Birla, Jharsuguda – Vedanta.
- Chhattisgarh – Kobra – Vedanta.
- BALCO – Ratnagiri – Maharashtra.
- NALCO – Koratpur – Odisha.
- MALCO – Mettur – Tamilnadu.

## COPPER REFINARIES

- Hindustan Copper – Khetri, Jhunjhunu district, Rajasthan.
- BALCO – Kobra, Chhattisgarh.
- Hindalco – Brila- Dahej, Bharuch district of Gujarat.
- Sterlite Industries – Tuticorin, Tamilnadu.