



Distance Learning Programme

UPSC Prelims

Indian Geography





drishti

INDIAN GEOGRAPHY

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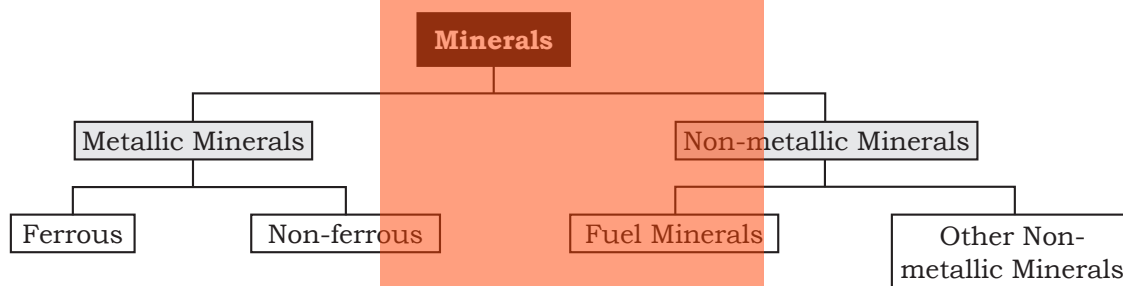
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MINERAL & ENERGY RESOURCES

Mineral resources are prerequisite for providing the necessary base for industrial development in a country. Fortunately, India is endowed with a rich variety of mineral resources due to its varied geological structure. It possesses more than hundred minerals, out of which, there are around thirty minerals which have economic significance. Some of the examples are coal, iron ore, manganese, bauxite, mica, etc. But the reserves of petroleum and some nonferrous metallic minerals, especially copper, lead, zinc, tin, graphite are inadequate.

Mineral Resources

Minerals can be grouped under two main categories of metallic and non-metallic on the basis of chemical and physical properties.



Metallic Minerals

- Metallic minerals are the sources of metals and provide a strong base for the development of metallurgical industry.
- Iron ore, bauxite etc. produces metal and are included in this category. Metallic minerals exhibit a metallic shine or lustre in their appearance.
- Metallic minerals can be further divided into ferrous and non-ferrous metallic minerals.

Ferrous Minerals

- All those minerals which have iron content are called ferrous minerals. Iron ore, manganese and chromites are examples of ferrous minerals.
- Ferrous Minerals account for about three-fourth of the total value of the production of metallic minerals. These minerals provide a strong base for the development of metallurgical industries, particularly iron, steel and alloys.
- India is well-placed in respect of ferrous minerals both in reserves and production.

Non-ferrous Minerals

- Minerals which do not contain iron are known as non ferrous mineral. Copper, bauxite, etc are non ferrous minerals.
- India is poorly endowed with non-ferrous metallic minerals, except bauxite.



Non-metallic Minerals

- Non-metallic minerals are either organic or inorganic in origin and do not contain extractable metals in their chemical composition.
- Based on their origin, they are further classified into two categories, i.e., mineral fuel and other non metallic minerals.
- India is endowed with a large number of non-metallic minerals, but only a few of these are commercially important. They are limestone, dolomite, mica, kyanite, sillimanite, gypsum and phosphate. These minerals are used in a variety of industries such as cement, fertilizers, refractories and electrical goods.
- **Mineral Fuels:** Mineral fuels are organic in origin and derived from the buried animal and plant life such as coal and petroleum. They are also known as fossil fuels.
- **Other Non-metallic Minerals:** Other non-metallic minerals are inorganic in origin such as mica, limestone and graphite, etc.

Characteristics of Minerals

Basic characteristics of a mineral are following:

- Definite crystalline structure
- Definite chemical composition
- Naturally occurring
- Formed by inorganic processes
- Solid

For a rock to be mineral it has to have at least three of these characteristics. Other characteristics of minerals are:

- These are unevenly distributed over space.
- There is an inverse relationship in quality and quantity of minerals i.e. good quality minerals are less in quantity as compared to low quality minerals.
- All minerals are exhaustible over time.
- Minerals take a long time to develop geologically and they cannot be replenished immediately at the time of need.

Distribution of Minerals

The distribution of mineral resources in India is uneven. The occurrences of mineral resources are associated with certain types of geological structure.

- Gondwana system is the repository of majority of Coal deposits.
- Dharwar and Cuddapah systems contain resources of major metallic minerals like copper, lead, zinc etc.

BOOSTER

Trends in Regional Distribution of Minerals in India

- Most of the major mineral resources occur to the east of a line linking Mangaluru and Kanpur.
- Over 97% of coal reserves occur in the valleys of Damodar, Sone, Mahanadi and Godavari.
- Petroleum reserves are located in the sedimentary basins of Assam, Gujarat and Mumbai High i.e. off-shore region in the Arabian Sea.
- New reserves have been located in the Krishna-Godavari and Kaveri basins.



- Vindhyan system contains major non-metallic minerals like limestone, dolomite, gypsum, calcium, sulphate etc.
- Most of the metallic minerals in India occur in the peninsular plateau region in the old crystalline rocks.

Major Mineral Regions of India

Although there may be some sporadic occurrences of minerals here and there in isolated pockets, but they are generally concentrated in three broad belts in India.

North Eastern Plateau Region

- It covers the Chhotanagpur plateau, Orissa plateau and the eastern Andhra plateau.
- This belt contains rich deposits of a variety of minerals, specially used for metallurgical industries such as iron ore, manganese, mica, bauxite, limestone, dolomite etc.
- This region has also rich deposits, coal, along the river valleys of Damodar, Mahanadi, and Son etc.
- This region has also a substantial amount deposit of copper, uranium, thorium, phosphate etc.

South-Western Plateau Region

- This region extends over the Karnataka plateau and adjoining Tamil Nadu plateau and is rich in metallic minerals, particularly in iron ore, manganese and bauxite and in some non-metallic minerals.
- All the three gold mines of India are found in this region. However, coal is not found in this plateau region except Neyveli lignite.
- Kerala has deposits of monazite and thorium, bauxite clay. Goa has iron ore deposits.

North-Western Region

- This belt extends from the gulf of Khambhat in Gujarat to the Aravalli range in Rajasthan.
- Copper, zinc has been major minerals in this belt.
- Rajasthan is rich in building stones, i.e. sandstone, granite, marble. Gypsum and Fuller's earth deposits are also extensive. Dolomite and limestone found in this belt provide raw materials for cement industry.
- Petroleum and natural gas are principal resources of this belt and other minerals are small and scattered.

Distribution of Important Minerals

Iron ore

India is endowed with fairly abundant resources of iron ore and the quality of Indian ore is very high with iron content of above 60 percent. Most of iron ore found in the country is of three types: Haematite, magnetite and limonite.

Types Iron ore	Iron content
Haematite (red ore)	68%
Magnetite (black ore)	60%
Limonite (yellow ore)	35%-50%

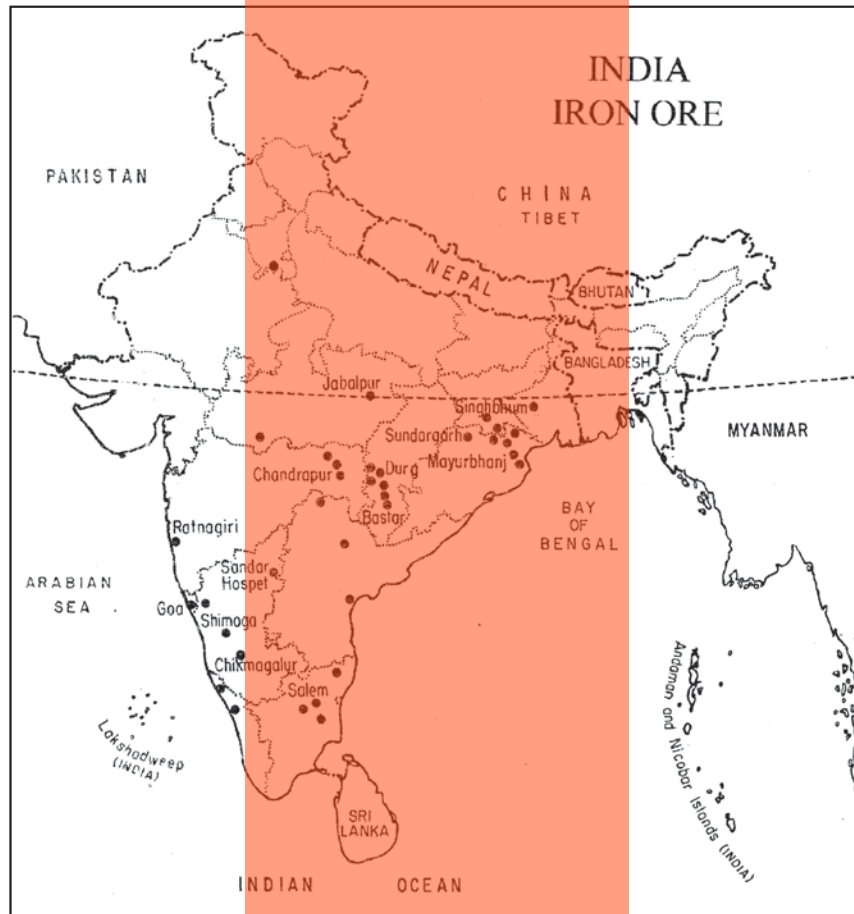


Fig: Distribution of iron ore in India

The iron ore mines occur in close proximity to the coal fields in the north-eastern plateau region of the country. About 95% of total reserves of iron ore is located in the States of Odisha, Jharkhand, Chhattisgarh, Karnataka, Goa, Telangana, Andhra Pradesh and Tamil Nadu.

States	Regions	Important Mines
Odisha	Sundergarh	Bonai
	Mayurbhanj	Gurumahisani, Sulaipet, Badampahar
	Jhar	Kiruburu
Jharkhand	Poorbi Singhbhum	Noamundi
	Pashchimi Singhbhum	Gua
Chhattisgarh	Durg	Dalli Rajhara
	Bastar	Dantewara, Bailadila
Karnataka	Ballari district	Sandur-Hospet
	Chikkamagaluru district, Shivamogga, Chitradurg Tumakuru	Baba Budan hills and Kudremukh

- Iron ore deposits of Andhra Pradesh are scattered in the Anantpur, Khammam, Krishna, Kurnool, Cuddapah and Nellore districts.
- Some deposits are also located in the state of Tamil Nadu, Maharashtra and Rajasthan.
- Bailadila and Rajhara mines in Chhatisgarh and Kiruburu mines in Odisha are being worked out specially for export purpose.
- Goa possesses inferior quality ore, but its contribution to the country's total production is impressive. Almost the entire production of iron from Goa is exported from Marmagao Port to Japan.

Manganese

India ranks third in the production of manganese ore in the world, next only to Russia and South Africa. Although Manganese deposits are found in almost all geological formations, but it is mainly associated with Dharwar system.

The important areas of production are in Odisha, Madhya Pradesh, Maharashtra, Karnataka and Andhra Pradesh. Over 78% of total reserves of manganese ore of India occur in a belt stretching from Nagpur and Bhandara districts of Maharashtra to Balaghat and Chhindwara district of Madhya Pradesh.

- Odisha is the leading producer of Manganese and accounts for 37% of the total production of the country. The important mining areas are Sundargarh, Rayagada, Bolangir, Keonjhar, Jajpur, Mayurbhanj, Koraput, Kalahandi and Bolangir.
- Karnataka is another major producer which accounts for 26% of country's total production and here the mines are located in Dharwar, Ballari, Belagavi, North Canara, Chikkmagalur, Shivamogga, Chitradurg and Tumakuru.
- Maharashtra is also an important producer of manganese, which is mined in Nagpur, Bhandara and Ratnagiri districts.
- The manganese belt of Madhya Pradesh extends in a belt in Balaghat-Chhindwara-Nimar-Mandla and Jhabua districts.
- Telangana, Goa, and Jharkhand are other minor producers of manganese. Manganese is an important raw material for smelting of iron ore and also used for manufacturing ferro alloys. About 85% of total manganese consumption in India is used by metallurgical industries.

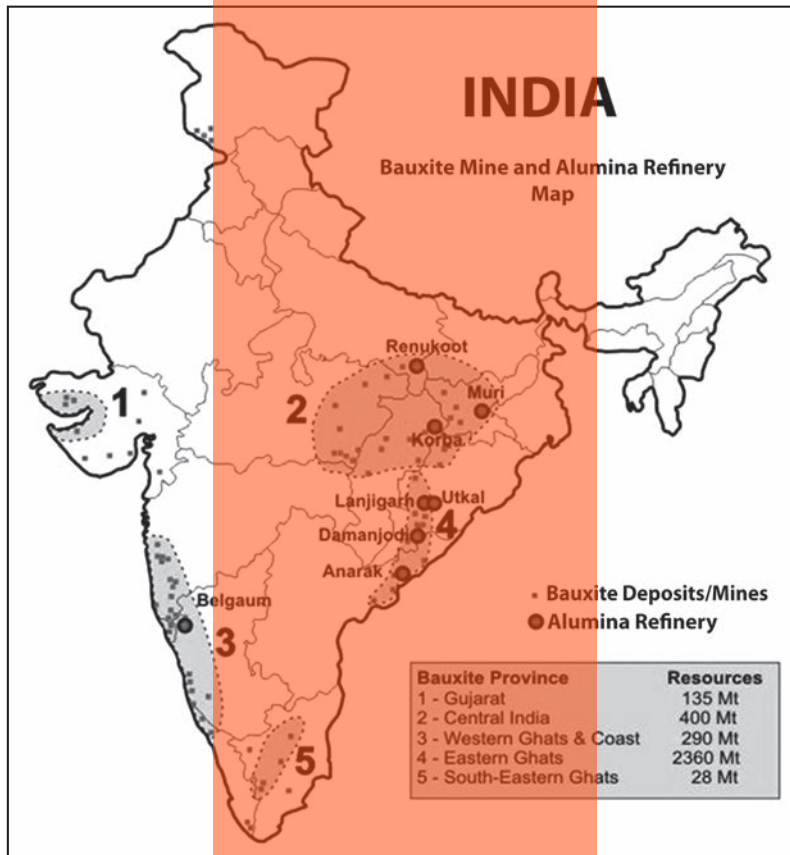
Bauxite

Bauxite is a non-ferrous metallic mineral which is used in manufacturing of aluminium. Bauxite is found mainly in tertiary deposits and is associated with laterite rocks.

Bauxite is found extensively either on the plateau or hill ranges of peninsular India and also in the coastal tracts of the country. India's reserves of bauxite are sufficient to keep the country self-reliant.

Major reserves occur in Jharkhand, Maharashtra, Madhya Pradesh, Chhatisgarh, Gujarat, Karnataka, Tamil Nadu, Goa and Uttar Pradesh. Huge deposits of bauxite have been discovered in the Eastern Ghats in Odisha and Andhra Pradesh, Salem, Nilgiri and Madurai district of Tamil Nadu, and Banda district of Uttar Pradesh also have workable deposits of bauxite.

- Odisha is the largest producer of Bauxite in India.



States	Region
Jharkhand	Palamau, Ranchi and Lohardaga districts
Gujarat	Bhavnagar, Junagadh and Amreli
Madhya Pradesh	Mandla, Shahdole and Balaghat and Katni district
Chhattisgarh	Sarguja, Raigarh and Bilaspur in amarkantak plateau
Maharashtra	Kolhapur, Raigarh, Thana, Satara and Ratnagiri districts
Karnataka	North-western parts of Belgaum district

- Kolaba, Thane, Ratnagiri, Satara, Pune and Kolhapur in Maharashtra are important producers.
- Tamil Nadu, Karnataka and Goa are minor producers of bauxite.
- Aluminium extracted from the ore is used in making aeroplanes, electrical appliances and goods, household fittings, utensils etc.

Copper

- Copper is an important metal in the electrical industry for making wires, electric motors, transformers and generators. India is a poor country with regard to reserves and production of copper.
- Major copper ore deposits are located in Singhbhum district (Jharkhand), Balaghat district (Madhya Pradesh) and Jhunjhunu and Alwar districts (Rajasthan).

- There are small deposits in Gujarat, Karnataka, Andhra Pradesh, Uttar Pradesh, Sikkim, Meghalaya, Maharashtra and West Bengal also.
- Madhya Pradesh is the largest producer of copper in India.
- Rajasthan is the second largest producing state in India and Khetri-Singhana belt in Jhunjhunu district is the most important copper producing area.
- The production of copper ore in the country always falls short of our requirements and India has to import copper from other countries.
- The major part of import comes from the USA, Canada, Zimbabwe, Japan and Mexico.

Mica

Mica is mainly used in electronic and electrical industries.

It can be split into very thin sheets which are tough and flexible. India is the leading producer in sheet mica.

Mica is widely distributed in India, but workable deposits occur in only three principle belts, i.e. states of Andhra Pradesh, Jharkhand, Bihar and Rajasthan.

- Bihar and Jharkhand are endowed with high-quality ruby mica. Mica deposit in Bihar is found in Gaya district, Munger district and Bhagalpur district.
- In Jharkhand the main mica belt is in Dhanbad, Palamau, Hazaribagh, Ranchi and Singhbhum districts.
- Nellore district in Andhra Pradesh produces the best quality mica. In Rajasthan, mica belt extends from Jaipur to Bhilwara and around Udaipur.
- Mica deposits are also found in Mysuru and Hasan districts of Karnataka, Coimbatore, Tiruchirapalli, Madurai and Kanniyakumari in Tamil Nadu, Alleppey in Kerala, Ratnagiri in Maharashtra, Purulia and Bankura in West Bengal.

Gold

- Gold is a precious metal and it occurs in auriferous lodes. It is used for making ornaments and is also used as international currency.
- There are three gold fields in the country, namely Kolar Gold Field, Kolar district, Hutti Gold Field in Raichur district (both in Karnataka) and Ramgiri Gold Field in Anantpur district (Andhra Pradesh).
- Karnataka is the largest producer of gold in India. The gold deposits in Kolar Gold Field occur in around 80 km long stretch. The area still continues to be the largest supplier of gold in India. Kolar Gold Fields is one of the deepest mines of the world. Mponeng

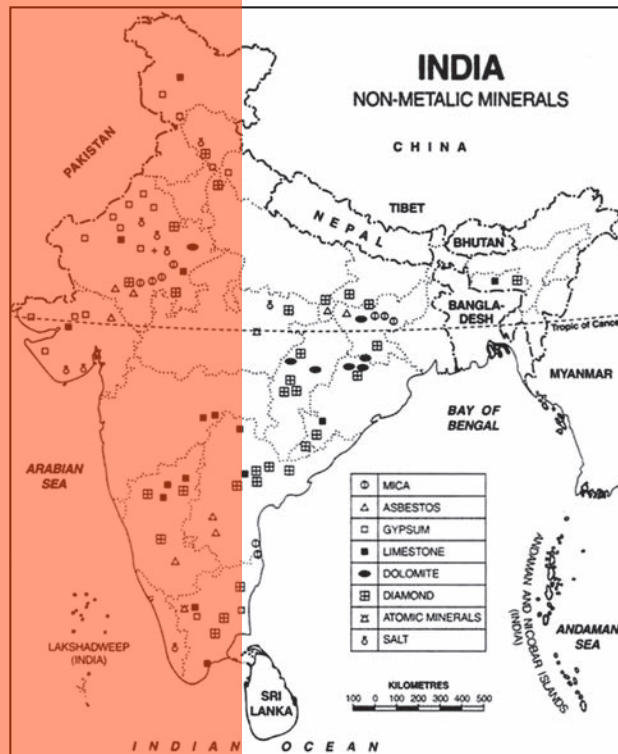


Fig: India: Distribution of Non-Metallic Minerals