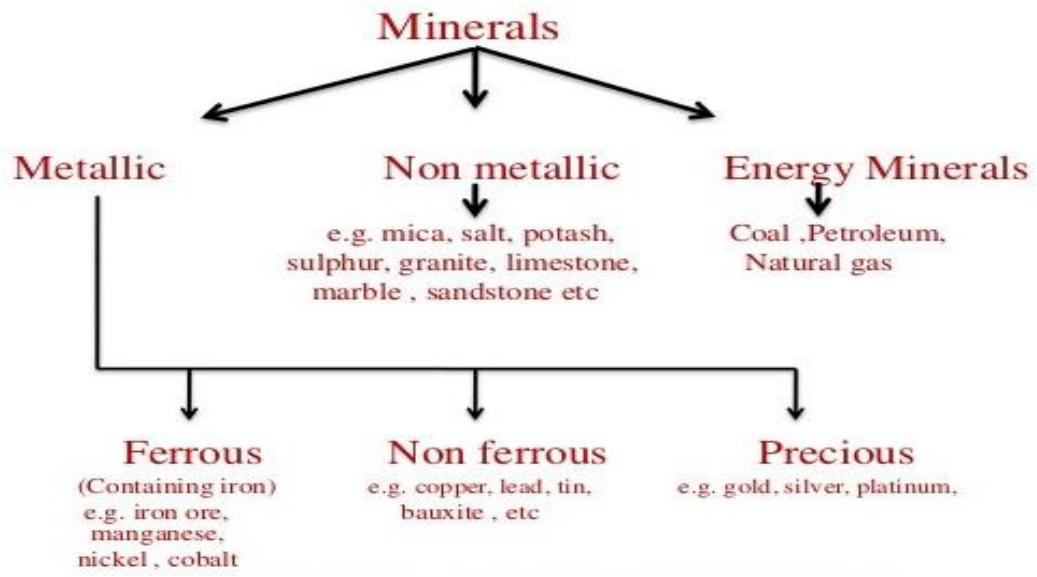
Minerals of India

Conventional wisdom and geological evidence suggest that India is richly endowed with mineral resources. Explorations have found over 20,000 known mineral deposits and recoverable reserves of more than 60 minerals.



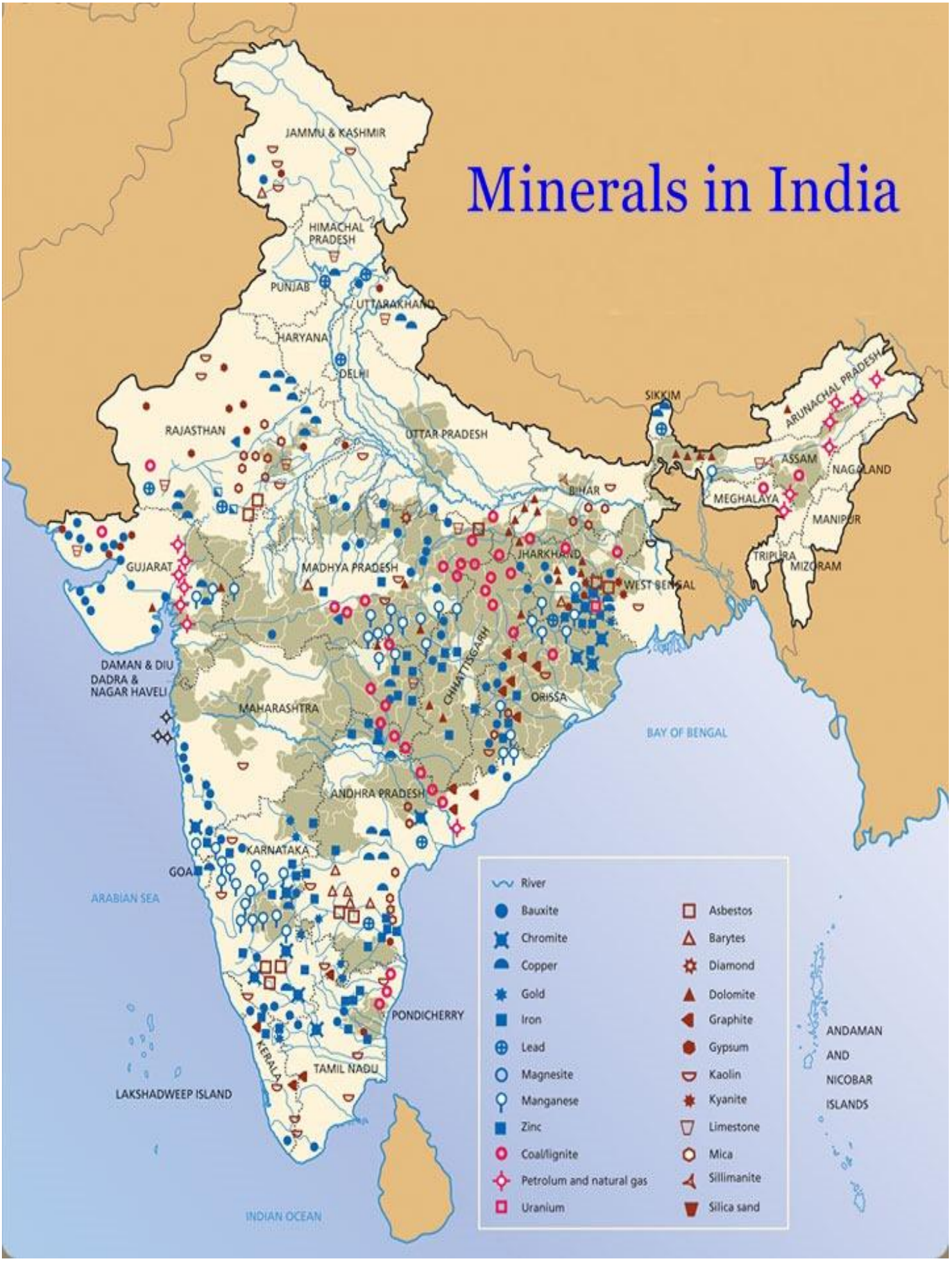
Distribution of Minerals

- Minerals are unevenly distributed on the earth's surface.
- All minerals are exhaustible in nature, i.e., will exhaust after a certain time.
- However, these minerals take long time to form, but they cannot be replenished immediately at the time of need.
- More than 97% of **coal** reserves occur in the valleys of Damodar, Sone, Mahanadi, and Godavari rivers.

Mineral Belts in India

There are **three major mineral belts** in India namely –

- The North-Eastern Plateau Region,
- The South-Western Plateau Region, and
- The North-Western Region.


Minerals in India
JAMMU & KASHMIR
HIMACHAL PRADESH
PUNJAB
UTTARAKHAND
HARYANA
DELHI
RAJASTHAN
UTTAR PRADESH
SIKKIM
ARUNACHAL PRADESH
ASSAM
NAGALAND
MEGHALAYA
MANIPUR
TRIPURA
MIZORAM
BIHAR
JHARKHAND
WEST BENGAL
GUJARAT
MADHYA PRADESH
CHHATTISGARH
ORISSA
DAMAN & DIU
DADRA & NAGAR HAVELI
MAHARASHTRA
BAY OF BENGAL
ANDHRA PRADESH
KARNATAKA
GOA
ARABIAN SEA
PONDICHERRY
KERALA
TAMIL NADU
LAKSHADWEEP ISLAND
INDIAN OCEAN
ANDAMAN AND NICOBAR ISLANDS
River
Bauxite
Chromite
Copper
Gold
Iron
Lead
Magnesite
Manganese
Zinc
Coal/lignite
Petrolum and natural gas
Uranium
Asbestos
Barytes
Diamond
Dolomite
Graphite
Gypsum
Kaolin
Kyanite
Limestone
Mica
Sillimanite
Silica sand

North-Eastern Plateau Region

- The major areas of north-eastern plateau region are Chhotanagpur (Jharkhand), Odisha, West Bengal, and parts of Chhattisgarh.
- Iron ore, coal, manganese, bauxite, and mica are the major minerals of the north-eastern plateau region.

South-Western Plateau Region

- The south-western plateau region covers major parts of Karnataka, Goa, and contiguous Tamil Nadu uplands and Kerala.
- Major mineral resources of south-western plateau region are iron ore, manganese, and limestone.
- Kerala has deposits of monazite and thorium, and bauxite clay and Goa has deposits of iron ore.

North-Western Region

- The north-western region covers the areas of Aravalli in Rajasthan and parts of Gujarat.
- Major minerals of north-western regions are copper and zinc; other significant minerals include sandstone, granite, and marble, along with Gypsum and Fuller's earth deposits.
- In addition, Gujarat and Rajasthan, both have rich sources of salt.
- The **Himalayan belt** is also an important mineral belt, as it has rich deposits of copper, lead, zinc, cobalt, and tungsten.

Major minerals found in the country :

1. Bauxite Ore (Aluminium):
The total in situation reserves is 3.076 million tonnes. About 84 per cent of this reserve is of metallurgical grade. The conditional resources of bauxite are about 5, 99,780 tonnes. In addition, prospective resources are placed at 90 million tonnes.

Orissa, Andhra Pradesh, Chhattisgarh, Gujarat, Maharashtra and Jharkhand are the principal states where bauxite deposits are located. Major reserves are concentrated in the East Coast Bauxite deposits of Orissa and Andhra Pradesh.

2. Chromite:

Total in situ reserves of chromite are estimated at 114 million tonnes. Total geological resources were estimated at 187 million tonnes, consisting of around 114 million tonnes in situ reserves and about 73 million tonnes as conditional resources.

The largest share (about 96 per cent) in the total geological resources is accounted by the Cuttack district in Orissa. Deposits of economic significance occur in Orissa, Karnataka, Maharashtra, Jharkhand, Madhya Pradesh, Chhattisgarh, Tamil Nadu and Manipur. However, refractory grade reserves of chromite are very meagre.

3. Copper:
The total in situ reserves of copper ore in the country are 712.5 million tonnes, equivalent to 9.4 million tonnes of metal content. The all-India conditional resources of copper are 722 million tonnes (3.15 million tonnes of copper metal) and prospective resources are 0.6 million tonnes of copper ore.

Major and important copper ore deposits are located in Singhbhum district (Jharkhand), Balaghat district (Madhya Pradesh) and Jhunjhunu and Alwar districts (Rajasthan). In addition, there are small copper ore deposits in Gujarat, Karnataka, Andhra Pradesh, Uttar Pradesh, Sikkim, Meghalaya, Maharashtra and West Bengal.

4. Gold:
There are three important gold fields in the country, namely, Kolar Gold Fields, Kolar district, Hutti Gold Field in Raichur district (both in Karnataka) and Ramgiri Gold Field in Anantpur district (Andhra Pradesh). Total in situ reserves of gold ore are estimated at 22.4 million tonnes, with 116.50 tonnes of metal.

5. Iron Ore:
The total in situ reserves of iron ore in the country are about 1,23,17,275 thousand tonnes of haematite and 53,95,214 thousand tonnes of magnetite. The resources of very high-grade ore are limited and are restricted mainly in the Bailadila sector of Chhattisgarh and to a lesser extent in Bellary-Hospet area of Karnataka and Barajamda sector in Jharkhand and Orissa.

Haematite resources are located in Orissa, Jharkhand, Chhattisgarh, Karnataka, Goa, Maharashtra, Andhra Pradesh and Rajasthan. Magnetite resources are located in Karnataka, Andhra Pradesh, Goa, Kerala, Jharkhand, Rajasthan and Tamil Nadu.

6. Lead-Zinc:
Lead-Zinc resources are located in Rajasthan, West Bengal, Andhra Pradesh, Gujarat, Madhya Pradesh, Uttar Pradesh, Orissa, Maharashtra, Meghalaya, Tamil Nadu and Sikkim. Total in situ reserves (all grades) of lead and zinc ores are 231 million

tonnes comprising metal content of 5.1 million tonnes of lead and 17.02 million tonnes of zinc metal.

7. Manganese:
The total in situ resources of manganese ore are 406 million tonnes out of which 104 million tonnes are proved, 135 million tonnes are in probable and 167 million tonnes are in possible categories. Main reserves fall in Karnataka, followed by Orissa, Madhya Pradesh, Maharashtra and Goa. Minor occurrences of manganese are in Andhra Pradesh, Jharkhand, Gujarat, Rajasthan and West Bengal.

8. Tungsten:
The total in situ reserves of tungsten ore have been estimated at 43.15 million tonnes or 1, 32,478 tonnes of W03 content. The main reserves are at Degana, Rajasthan. It also occurs in Maharashtra, Haryana, West Bengal and Andhra Pradesh.

9. Diamond:
Diamond deposits occur in three types of geological settings such as kimberlite pipes, conglomerate beds and alluvial gravels. The main diamond bearing areas in India are the Panna belt in Madhya Pradesh, Munimadugu-Banganapalle conglomerate in Kurnool district, Wajrakarur Kimberlite pipe in Anantapur district and the gravels of Krishna river basin in Andhra Pradesh.

Reserves have been estimated only in the Panna belt and Krishna Gravels in Andhra Pradesh. The total in situ reserves are about 26, 43,824 carats. There are conditional resources of 19, 36,512 carat. The new kimberlite fields are discovered recently in Raichur-Gulbarga districts of Karnataka.

10. Dolomite:
Dolomite occurrences are widespread in almost all parts of the country. The total in situ reserves of all grades of dolomite are 7,349 million tonnes. The major share of about 90 per cent reserves is distributed in the states of Madhya Pradesh, Chhattisgarh, Orissa, Gujarat, Karnataka, West Bengal, Uttar Pradesh and Maharashtra.

11. Fluorspar:
Total in situ reserves of fluorspar in India are 14.15 million tonnes. Commercial deposits of Fluorspar are located in Gujarat, Rajasthan, Madhya Pradesh and Maharashtra.

12. Gypsum:

The in situ reserves of gypsum are estimated at 383 million tonnes. Out of this, two millions are of surgical/plaster grade. 92 million tonnes of fertilizer/pottery grade, 76 million tonnes of cement/ paint grade, 13 million tonnes of soil reclamation grade and the rest is unclassified. The production of gypsum is confined to Rajasthan, Tamil Nadu, Jammu and Kashmir, and Gujarat. Rajasthan is the main producer of gypsum followed by Jammu and Kashmir.

13. Graphite:

The in situ reserves of graphite are 16 million tonnes. Orissa is the major producer of graphite. Almost the entire reserves of Tamil Nadu under the proved category are in Ramanathapuram district. Deposits of commercial importance are located in Andhra Pradesh" Jharkhand, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan and Tamil Nadu.

14. Limestone:

The total in situ reserves of limestone of all categories and grades are placed at 1, 69,941 million tonnes. The total conditional reserves have been estimated at 3,713 million tonnes.

The major share of its production comes from Madhya Pradesh, Chhattisgarh, Andhra Pradesh, and Gujarat: Rajasthan, Karnataka, Tamil Nadu, Maharashtra, Himachal Pradesh, Orissa, Bihar, Uttaranchal and Uttar Pradesh. The remaining part comes from Assam, Haryana, Jammu and Kashmir, Ker and Meghalaya.

15. Mica:

India is the world's leading producer of sheet mica and accounts for about 60 per cent of global mica trade. Important mica-bearing pegmatite occurs in Andhra Pradesh, Jharkhand Bihar and Rajasthan.

The total in situ reserves of mica in the country are placed at 59, often tonnes. The in situ reserves of mica in Andhra Pradesh are 42,626 thousand tonnes, Bihar 12,938 tonnes, Jharkhand 1,494 tonnes and in Rajasthan 2,007 tonnes.

16. Magnesite:

The total in situ reserves of Magnesite are about 415 million tonnes of which 76 million tonnes are in the proved category. Major deposits of magnesite are found in Uttaranchal, Tamil Nadu and Rajasthan while minor deposits are in Jammu and Kashmir, Karnataka, Himachal Pradesh and Kerala.

17. Other Minerals:

Other minerals occurring in significant quantities in India are bentonite (Rajasthan, Gujarat, Jharkhand and Jammu and Kashmir), corundum (Karnataka, Andhra Pradesh, Rajasthan and Chhattisgarh), clacite (Andhra Pradesh, Rajasthan, Madhya Pradesh, Tamil Nadu, Haryana, Karnataka, Uttar Pradesh and Gujarat), fuller's earth (Rajasthan, Jharkhand, Bihar, Andhra Pradesh, Tamil Nadu, Maharashtra, West Bengal and Karnataka), garnet (Tamil Nadu, Orissa, Andhra Pradesh, Rajasthan and Kerala), pyrites (Jharkhand; Rajasthan, Karnataka, Himachal Pradesh and Andhra Pradesh), steatite (Rajasthan, Uttar Pradesh, Kerala, Maharashtra and Madhya Pradesh), wollastonite (Rajasthan and Gujarat), zircon (beach sand of Kerala, Tamil Nadu, Andhra Pradesh and Orissa) and quartz and silica minerals are widespread and occur in nearly all states.

Besides, the country has vast marble, slate and sandstone. Granite is mainly mined in Tamil Nadu, Karnataka, Andhra Pradesh and Rajasthan; marble in Rajasthan, Gujarat and Uttar Pradesh; slate in Chhattisgarh, Madhya Pradesh. Haryana and Andhra Pradesh; and sandstone in Rajasthan.