MINERAL AND ENERGY RESOURCES.

- Geologists: studies these minerals deeply, its formation, age and physical & chemical properties.
- Geographers: studies minerals as part of Earth's crust.

Mode of Occurrence of Minerals:

- minerals are usually found in "ores". The term ores is used to describe an accumulation of any mineral mixed with other elements.
- The mineral content of the ores must be in sufficient concent" to make its extraction commercially viable

minerals generally occur in these forms:

i]. in igneous & metamorphic rocks, minerals may occur in cracks and joints.
- small cracks - veins
- large cracks - lodes.
- Tin, copper, zinc, lead.

ii]. in sedimentary rocks minerals occur in beds and layers.
- coal → heat & pressure
- potash salt, common salt, gypsum — in arid region formed due to evaporation.

iii]. decomposition of surface rocks, leaving a residual mass of weathered material.
- Eg: Bauxite.

iv]
- alluvial deposits in sands of valley floor and base of hills.
- these minerals are generally not corroded by water
- Eg: gold, silver copper.

v]. ocean contains a vast amount of minerals.
- But these are not easily accessible which makes it economically insignificant
- Eg: salt, magnesium, Bromine.

minerals

Metallic

Ferrous
- Iron ore
- i] Magnetite
  - high iron content (70%)
  - finest
- ii] Hematite
  - imp for industrial use
  - 50% - 60% iron
  - ↓ major iron belts:
    - Odisha-Jharkhand belt.
      - hematite ore
    - Durg-Bastar Chandrapur belt.
      - Chattisgarh & Maharastra
      - 14 deposits of high grade hematite ore
      - exported to Japan & South Korea.
    - maharashtra-Goa belt.
      - not high quality.
      - Ratnagiri district
      - marmagoo port.
    - Ballari-Chitradurga-chikkamagaluru-Tumakuru belt.
      - 100% export unit
      - from port of mangulutu
      - transported as slurry through pipeline.

Non ferrous
- copper
  - all metal ki properties
  - Location: MP, Rajasthan, Jharkhand
- Bauxite (ore)
  - a clay like substance that gives aluminium
  - Aluminium
    - ★ cheap
    - ✗ light weight
    - ★ good conductor
  - Locatn:- Amarkantak plat, maikal & odisha & Bilaspu-Katni

Non metallic
- mica
  - made up of series of plates or leaves
  - colour - black, green, red, yellow, brown
  - good insulator
  - Chota Nagpur plateau
  - Jharkhand
  - Rajasthan.
  - Andhra Pradesh
- Limestone
  - Calcium carbonate, magnesium carbonate.
  - raw material in cement industries
  - smelting.
  - Rajasthan no 1 producer.
- ② Petroleum
  - acts as nodal industries
  - The oil bearing layer is porous limestone.
  - The oil is prevented from sinking or rising by layer of non porous rocks.
  - Mumbai, Gujarat, Assam.
- ③ Natural gas:
  - found with petroleum, found when crude oil is released.
  - Krishna - Godavari Basin
  - Gas grid by linking all sources in India.
  - GAIL
  - CNG, PNG

Energy minerals
- ⑥ Geo-thermal Energy: electricity produced using interior of Earth.

Conventional source of energy
- ① Coal: bulky, heavy.
  - peat:
    - low Carbon
    - high moisture
  - Lignite:
    - brown
    - low grade
    - high moisture
    - generate electricity
    - Location: Neyveli
  - bituminous: 2nd best
    - most popular
    - smelting
  - Anthracite:
    - high quality
    - hard
    - Gondwana 200 million
    - tertiary coal 55 million.
- ④ Electricity:
  - ① Hydro water electricity
  - ② Thermal electricity
    - petroleum & Natural gas

Non-conventn source of energy
- ① Nuclear or Atomic energy:
  - alteration is made, much energy is released in form of heat → generatn of electric power
  - Uranium Thorium: Kerala, Rajasthan
- ② Solar Energy:
  - minimises dependance of rural household on firewood & dung cakes
  - conserves enviornment
  - sunlight → electricity
  - Photovoltaic technology
- ③ Wind power.
  - wind mills - Tamil Nadu, Gujarat, Karnataka Kerela.
- ④ Bio gas:
  - gobar gas plts
  - enviornmtn friendly
- ⑤ Tidal energy:
  - high tide → H2O gets trapped
  - low tides

Manganese → used to make steel and alloy → 10 Kg Mn → 1 tonne of steel
→ insecticides, paints etc

CONSERVATION of minerals

- minerals form only 1% of earth's crust.
- minerals are → finite
  → short-lived
  → non renewable.

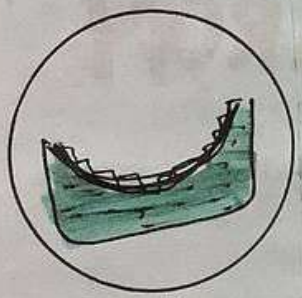
- Solⁿ:-

① improve technology to even use low grade minerals efficiently.
② Recycling ④ Promote sustainable development. ⑥ use power saving devices.
③ Finding substitutes ⑤ use public transport

HAZARDS OF MINING

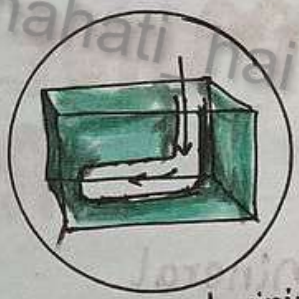
- The dust and noxious fumes inhaled by miners make them vulnerable to heart diseases.
- Risk of collapsing mine roofs, floods, fire etc.

important : 3 pie charts



open pit mining

quarry



underground mining with shafts.