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NCERT Class 10 Geography

Chapter 5: Minerals & Energy Resources

Why we need minerals?

- Everything from pin to ship
- Toothpaste - silica, limestone, aluminum oxide and various phosphate
- Fluoride – reduce cavities
- Toothpaste are white – titanium oxide (from rutile, ilmenite & anatase)
- Toothpaste sparkle – mica
- Tube – made of plastics from petroleum
- Body requires 0.3% minerals of total nutrients
- Homogenous, naturally occurring substance with a definable internal structure
- Hard as diamond & soft as talc (Mohs scale – measure hardness)

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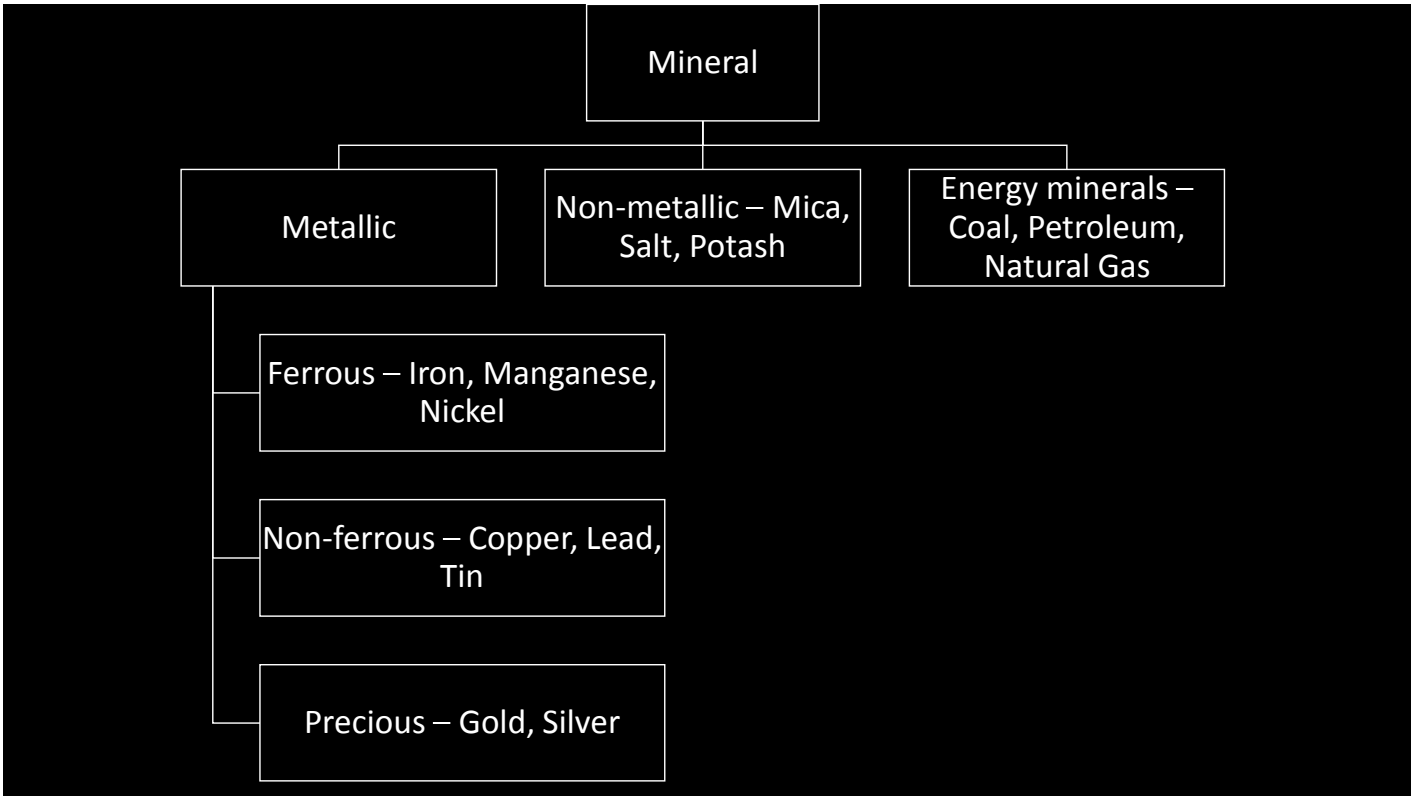
Mineral occur as ORE

- Rocks are combination of minerals
- Colors, hardness, crystal forms, lustre and density
- Igneous and metamorphic rocks minerals – in cracks, crevices, faults or joints.
- Smaller occurrences are called veins and the larger are called lodes
- Sedimentary rocks - occur in beds or layers – gypsum, potash & sodium salt
- Alluvial deposits in valley floor; placer – gold, silver, tin, platinum
- Ocean water – salt, magnesium, bromine
- Coal mining – Jowai & Cherrapunjee by long narrow tunnel – Rat hole mining
- Sedimentary rock in Assam and Gujarat – petroleum deposit



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Iron Ore - Ferrous

- Magnetite is finest – 70% iron – has magnetic property
- Hematite – lower iron (50-60%) – industrial use
- Top producer – Karnataka > Orissa > Chhattisgarh
- Orissa (Badampahar mines in Mayurbhanj & Kendujhar)-Jharkhand belt (Gua & Noamundi mines in Singhbhum): Hematite
- Durg-Bastar (Bailadila -14 deposits) -Chandrapur belt lies in Chhattisgarh and Maharashtra - Hematite - Exported to Japan & South Korea via Vishakapatnam port.
- Bellary-Chitradurga-Chikmaglur-Tumkur belt in Karnataka - Kudermukh – 100% export unit and amongst largest in the world. Transported as slurry by pipe to port near Mangalore.
- Maharashtra (Ratnagiri) -Goa belt - very high quality & exported by Marmagao port

Manganese - Ferrous

- Used in steel and ferro-manganese alloy
- 10 kg Mn used to make 1 ton steel
- Used on bleaching powder, insecticide & paint
- Orissa (1/3rd of total) > MP > Karnataka – production

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Copper – Non-Ferrous

- India is deficient
- Mainly used in cables, conductors & chemical ind.
- Balaghat Mines (MP) – 52% production
- Singhbhum in Jharkhand
- Khetri in Rajasthan

Bauxite – Non-Ferrous

- Ore of Aluminum
- Decomposition of rocks rich in aluminum silicates
- Light, conductive and malleable
- Highest production by Orissa (45% - max. in Panchpatmali in Koratpur), then Gujarat & Jharkhand
- Amarkantak plateau, Maikal hills and plateau region of Bilaspur-Katni
- *Napoleon III – used button & utensils of Al (lower people used gold & silver), then 30 years later Al used by beggars of France*

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Mica – Non-Metallic

- Layered into sheets
- Di-electric strength, low power loss factor, insulating properties and resistance to high voltage
- Northern edge of the Chottanagpur plateau.
- Koderma, Gaya – Hazaribagh belt of Jharkhand
- Ajmer – Rajasthan
- Nellore – Andhra Pradesh

Limestone – Rock Minerals

- Carbonates and sedimentary rocks
- Used in cement ind. & smelting of iron ore
- Production order – AP>MP> Raj.

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Mining & Conservation

- Mining – killer industry
- Pulmonary diseases
- Water contamination
- Slurry waste
- Collapse of roof, inundation and fires
- Workable deposits – only 1% of crust
- Replenishment < Consumption
- Finite and non-renewable resource
- Recycling of metals
- Energy saved is energy produced

Energy Resources

- Conventional – firewood & cattle dung cake (rural - 70% energy), coal, petroleum, natural gas and electricity
- Non-Conventional - solar, wind, tidal, geothermal, biogas & atomic energy

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Coal – Fossil Fuel

- Formed by compression of plants
- Peat – low carbon, high moisture (decaying in swamps)
- Lignite – low grade, brown – soft and high moisture (Neyveli – T. Nadu)
- Bituminous – Buried deep and higher temperature – in commercial use – smelting in blast furnace
- Anthracite – High quality

Coal Deposits

- Gondwana (>200 mya): Damodar valley (West Bengal-Jharkhand), Jharia, Raniganj, Bokaro, Godavari, Mahanadi, Son and Wardha valleys
- Tertiary (< 50 mya): NE states - Meghalaya, Assam, Arunachal Pradesh and Nagaland.
- Bulky – so heavy ind. & thermal plant near coalfields

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Petroleum

- Nodal industry for fertilizer, textile etc.
- Called liquid gold
- With anticlines and fault traps in tertiary rocks
- In Anticlines - oil is trapped in crest of upfold
- Fault trap b/w porous & non-porous rock (gas over oil)
- 63% production - Mumbai High, 18% from Gujarat and 16% from Assam
- Ankeleshwar - Gujarat
- Assam - oldest oil producing state (Digboi, Naharkatiya and Moran-Hugrijan)

Natural Gas

- Clean energy
- With or without petroleum
- Low CO_2 emission
- Krishna- Godavari basin, Mumbai High, Gulf of Cambay & A & N Is.
- Compressed Natural Gas (CNG) for vehicles to replace liquid fuels
- 1700 km pipeline: Hazira (Guj.) -Bijaipur (MP) –Jagdishpur (UP) links Mumbai High and Bassien
- HBJ - Gas daily to 3 power houses at Kawas (Gujarat), Anta (Rajasthan) and Auraiya (U.P.) & 6 fertilizer plants at Bijapur, Sawai Madhopur, Jagdishpur, Shahjahanpur, Aonla and Babrala

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Electricity

- Thermal – Use coal, petrol & gas
- Hydel – Bhakra Nangal, Damodar etc.
- Nuclear – Uranium & thorium form Jharkhand & Aravallis; monazite from Kerala (thorium)

Non-Conventional

- Solar – Sun – Madhapur in Bhuj (sterilize milk can)
- Wind - Tamil Nadu (Nagarcoil to Madurai), AP, Karnataka, Gujarat, Kerala, Maharashtra, Lakshadweep & Jaisalmer
- Biogas – Gobar gas – kerosene, dung cake, charcoal
- Tidal – Gulf of Kuchchh
- Geothermal - Parvati valley near Manikaran in HP & Puga Valley, Ladakh

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Tough Go! Race to be 100% Renewable

- Sweden – Aim to be 1st nation to 100% fossil fuel free
- Costa Rica - carbon-neutral by 2021
- Nicaragua – 90% by 2020
- Scotland – mainly wind – meet 97% household needs
- Germany – leads in solar – met 78% household needs