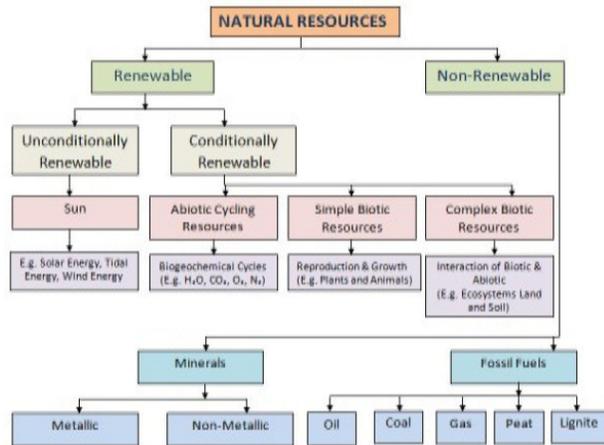
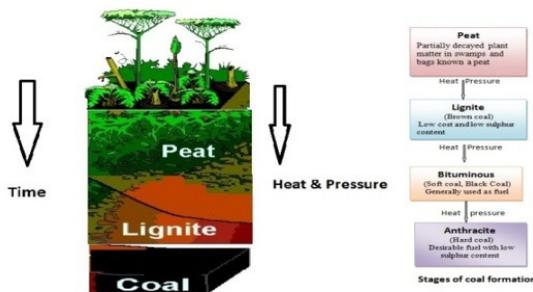


## 16. CONSERVATION OF OTHER NATURAL RESOURCES

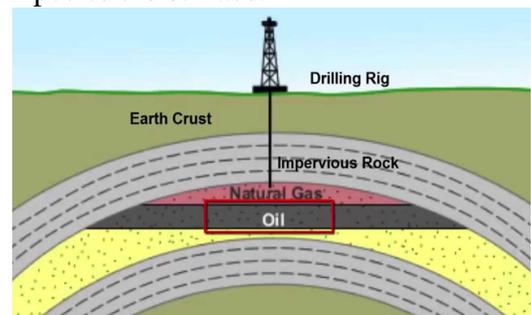
- Natural resource conservation involves wise use of natural resources so that they are not wasted, depleted or degraded and are available to both present and future generations
- Classification of natural resources



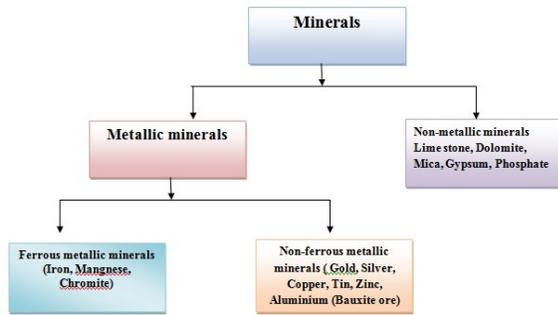
- Fossil fuel includes all forms of stored solar energy including coal, lignite, peat, crude oil (petroleum) and natural gas, are considered as primary sources of energy.
- These energy resources are non-renewable and exhaustible.
- Coal, oil and natural gas are three major fossil fuels that are conventional sources of energy.
- Coal is a solid fossil fuel that was formed in several stages (mentioned in fig.) as the buried remains of land plants that lived 300-400 million years ago



- Mining and burning of coal has severe environmental impact on air, water and land and accounts for more than one third of the world's annual CO<sub>2</sub> emissions.
- Petroleum or crude oil (oil as it comes out of the ground) is a thick liquid containing a complex mixture of hydrocarbons with sulphur, nitrogen and oxygen.
- Deposits of crude oil and natural gas are tapped together within the earth crust or under the seafloor.
- The crude oil is dispersed in pores and cracks in underground rock-formations like water saturating a sponge.
- The oil drawn out of the rock pores and into the bottom of the well and from where it is pumped to the surface.



- Natural gas contains methane and smaller amounts of propane and butane. When a natural gas field is tapped, propane and butane gases are liquefied and removed as liquefied petroleum gas (LPG).
- India has extensive and rich deposits of industrially important minerals.
- Minerals like water and land are invaluable treasure of the earth. Minerals play a significant role in industrialization and economic development of a country.
- Minerals are broadly divided into two groups- metallic and non-metallic minerals. Metallic minerals are further subdivided into ferrous and non-ferrous.



• **Metallic minerals and their uses**

Non Metals	Uses	Properties
Iron	Construction, ships, road vehicles, appliances eg. cookers	Malleable, can be moulded Rusts Forms alloys eg. Stainless steel
Aluminium	Packaging, vehicles, construction-window frames etc.	Malleable Good conductor of Heat and electricity Corrosion resistant
Copper	Electric cables Water pipes	Malleable Very good electric conductor Corrosion resistant
Chromium	Stainless steel	Forms alloys-makes steel harder and corrosion resistant

• **Non-metallic minerals and their uses**

Non Metallic minerals and their Uses

Non Metals	Uses	Properties
Limestone	Building Blocks, crushed for road surface, railway track ballast, cement	Hard, easily cut and crushed, resistant to wear. Baked lime(with clay and gypsum) hardens when mixed with water
Granite	Building Blocks, Kitchen worktops, floor tiles, crushed for road surface chippings	Hard and resistant to wear
Sand	Builder's mortar glass	Fine grained inert filler, transparent in thin sheets
Gravel	Concrete	Coarse grained filler

- We should take the following steps to conserve non-renewable resources.
  - Prohibiting wastage of resources
  - Use of substitutes
  - Recycling resources
  - Repair and use
- To check and reduce depletion of minerals,
- Five choices are recycle or reuse existing supplies, waste less, use less and find a substitute.

- Substitution of more abundant materials like plastic and glass, for scarce minerals is an important way to check depletion.
- One way to improve mining technology is to use microorganisms to extract metals from its ores known as “**biomining**” or ‘ecological engineering’
- The science of **nanotechnology** has immense potential of using atoms in producing or manufacturing everything from medicines to solar cells to automobile bodies.
- When a resource (mineral) becomes scarce, its price rises.
- This can encourage exploration of new deposits, stimulate development of better mining technology and make it profitable to mine lower-grade ores
- Renewable resources are those that can be formed or regenerated by natural processes.
- Air, water, soil, vegetation and animals renewable primary resources because they naturally recycle and reproduce themselves.
- Renewable resources can be perpetual or unconditional which will last forever on human time scale and conditional renewable resources which must reproduce and regenerate in order to last forever.
- Solar, Winds and tidal energy are virtually inexhaustible resources on human time scale. This is an example of unconditionally renewable resources.
- Solar energy is harnessed through "solar panel". Solar panels directly which heat homes by solar radiation.
- Solar volatile cells are used in solar TV's and solar thermal energy is used to cook food in solar cookers.



- The greater heating of earth by sun at the equator than at the poles and the rotation of the earth set up flows of air called wind.
- Wind is an indirect form of solar energy and can be captured by wind turbines to generate electricity. Coastal areas of India are particularly suitable for generating electricity from wind energy.
- **Wind Mill** is a mill that converts energy of wind into electrical energy by means of rotation of blades.



- **Tidal** Energy can be generated from high tidal waves. In India, areas identified for generating tidal energy are located in Gulf of Kutch and Cambay in Gujarat.
- **Land and soil** are the examples of conditional renewable resources
- Land is a precious resource, which humans have used for agriculture, mining etc.
- The use of land results in changing in structure and function of the ecosystems.
- Human exploitation of land for various activities like agriculture, industry, housing, entertainment etc. ultimately results in the degradation of land.
- The degraded lands have reduced capacity to sustain healthy growth of crops and plants.
- We can conserve our land resources and soil preservation by adopting the few measures:
- Contour ploughing is a measure to conserve our land. By this method, the fields are ploughed, harrowed and sown along the natural contour of the hills.
- By terracing method: A series of wide steps are made along the slope following the contours. This method is very common in rice growing regions.
- Under the afforestation and reforestation programmes, planting of trees, bushes and grass help to check the soil erosion,
- Strict actions are taken to check reckless felling of trees and overgrazing.
- Shelter belts (rows of trees) are planted on the margins of desert areas to check the fury of wind.
- Construction of dams and gully-trap inculcate the water-harvesting.
- Soil erosion can be prevented by afforestation, step or terrace farming methods.
- Water is an invaluable resource which makes life possible on earth. We generally depend on fresh water resources for our survival which is finite in quantity.
- Prevention of water wastage.
  - Increasing water use efficiency.
  - Recycling of water
  - Capturing and storing more floods run off.
- Biodiversity is valuable renewable resource. Plant and animal are able to reproduce and maintain their healthy populations.
- Biodiversity is of great use to humans as they derive many direct and indirect benefits from the living world.
  - Harvesting rain water.
  - desalinating sea water.
- We must preserve our forests and wild animals
- The government has now started protecting forests by converting them into national parks and wildlife or bird sanctuaries.



### Check Yourself

1. Which one of the following is non-metallic mineral?
  - a. Iron
  - b. Gold
  - c. Chromite
  - d. Kyanite
2. Which one of the following state is leading state for phosphate mineral?
  - a. Uttar Pradesh
  - b. Rajasthan
  - c. Madhya Pradesh
  - d. Uttaranchal
3. Tidal energy generation areas in India is located in:
  - a. Maharastra
  - b. Kerala
  - c. Gujarat
  - d. Tamil Nadu
4. Deep sea floor minerals are:
  - a. Gold
  - b. Silver
  - c. Manganese
  - d. All the above
5. Major causes of biodiversity loss are:
  - a. Pollution
  - b. Over exploitation of ecosystem
  - c. Habitat destruction



### Stretch Yourself

1. Why do we consider sun as unconditionally renewable resource?
2. How do we minimize depletion of mineral?
3. Name different ores of iron.
4. Expand term LPG
5. Why do we consider soil is anon-renewable source?



### Test Yourself

1. Discuss about primary energy sources and their utilization
2. Describe the formation of coal
3. Mention use of aluminum, limestone and iron
4. Suggests any four ways for fast depletion of minerals
5. Mention any four methods to check depletion of fresh water resources.