

Introduction :-

Natural resources are the components of environment which are inherently created by environment for supporting life. These resources are available in atmosphere, hydrosphere, and lithosphere in the form of air, water, soil, minerals, forests, food, animals, plants, energy etc. These resources are very essential for sustaining life on earth.

Types of Natural Resources :-

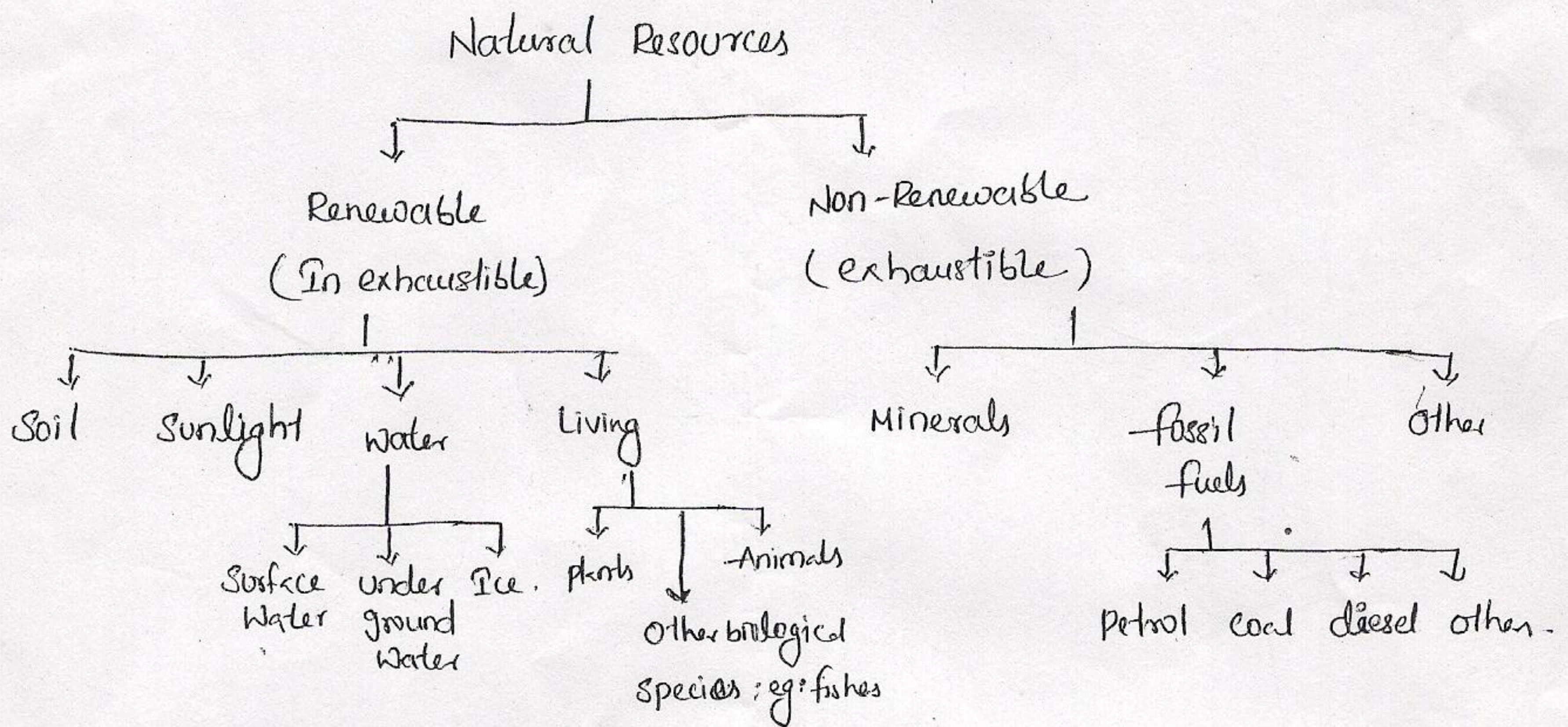
- ① Renewable ② Non-Renewable.

①. Renewable resources can never exhaust. It is because by inherent mechanism, they reappear by recycling, replacement or reproduction.

eg: Vegetable plant, trees in a forest can grow again and again after getting destroyed but their rate of growth may vary widely.

②. Non-Renewable resources are available in a fixed quantity therefore they can exhaust after certain period of time.

eg: The fossil fuels are estimated to be available for not more than 50 years only.



Pratish

Hydro Energy :-

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Large amount of kinetic energy of the flowing water is tapped using water turbines. Hydro power projects involves construction of dams. Currently 20% of the world's energy demand is produced in the form of hydro-energy. India is tapping about 84000 MW through hydel potential. Totally 271 projects have been installed in India.

Advantages :-

- ①. Clean source of energy
- ②. Provides irrigation facilities
- ③. Provides drinking water to the people living around

Disadvantages :-

- ①. It has some environmental and socio-economic problems.
 - ①. Submerged forests and agricultural land.
 - ②. Loss of biodiversity
 - ③. Water logging and silting etc.

Geothermal Energy :-

The earth is having large amount of geothermal energy with a higher temp. i.e. 4500°C . The energy comes from the molten rocks material beneath the earth surface. The available thermal energy is used to produce power by running a smaller capacity thermal power plants.

Geothermal energy from hot springs can also be used for producing power, space, heating, industrial processing and green houses.

Advantages :-

- ①. Abundance availability for no price.
- ②. Non-polluting and eco-friendly
- ③. useful at remote places also for electricity generation.
- ④. Suitable for power supply at off-shore and on-shore (hilly regions) sites.
- ⑤. Cheaper installation cost and almost negligible recurring expenditure.

Limitations :-

- ①. May not be available regularly and uniformly
- ②. Less favourable in city locations, as the wind is available at higher locations, ~~as the wind is available at higher locations~~.
- ③. Since the flow of wind can't be guaranteed throughout the year and uniform also during 24 hrs, their use for a continuous supply power station is not feasible.
- ④. Due to fluctuating nature of wind blowing, the produced mechanical energy has to be stored in by some means eg: battery storage.

Tidal Energy :-

Ocean tides produced by gravitational forces of sun and moon contain ^{tides} enormous amount of energy. The high-tide and low-tide refer to the rise and fall of water in the oceans, the alternative rise and fall of seawater possess lot of energy. The identified tidal power potential in India is around 9000 MW. Currently France, Russia, China and Canada are effectively utilizing the ~~to~~ tidal energy to produce 2 to 3% their energy demand.

2 or 3 neutrons are liberated by the fission of a nucleus of ${}_{92}^{235}\text{U}$ isotope. The liberated neutron can cause fission in additional nuclei thus liberating more neutrons which can cause further fissions and so on.

A Nuclear reactor is a device that permits a controlled nuclear fission reaction. The fuel rods containing U-235 in the form of pellets are placed in the core of the reactor. U-235 gives large amount of energy & neutron which causes chain reaction.

Ex: α, β, γ & δ -rays.

Getting nuclear energy through a process

- ① Nuclear fission
- ② Nuclear fusion

1 kg of U liberates an energy equivalent to 35000 kg of Cal. This heat is picked up by a coolant for transfer to electric generator. beside generating electricity nuclear energy is also used to running submarines, warships, space-crafts etc.

The first nuclear reactor was started in USA on Dec-2 1942, today almost all countries have atomic reactors for power generation. In France 73% of the common energy is provided by atomic reactors. The share is very little in India (1%).

Indian reactors: At Tarapur (Maharashtra), Kota (Rajasthan), Kalpakkam (Tamilnadu).

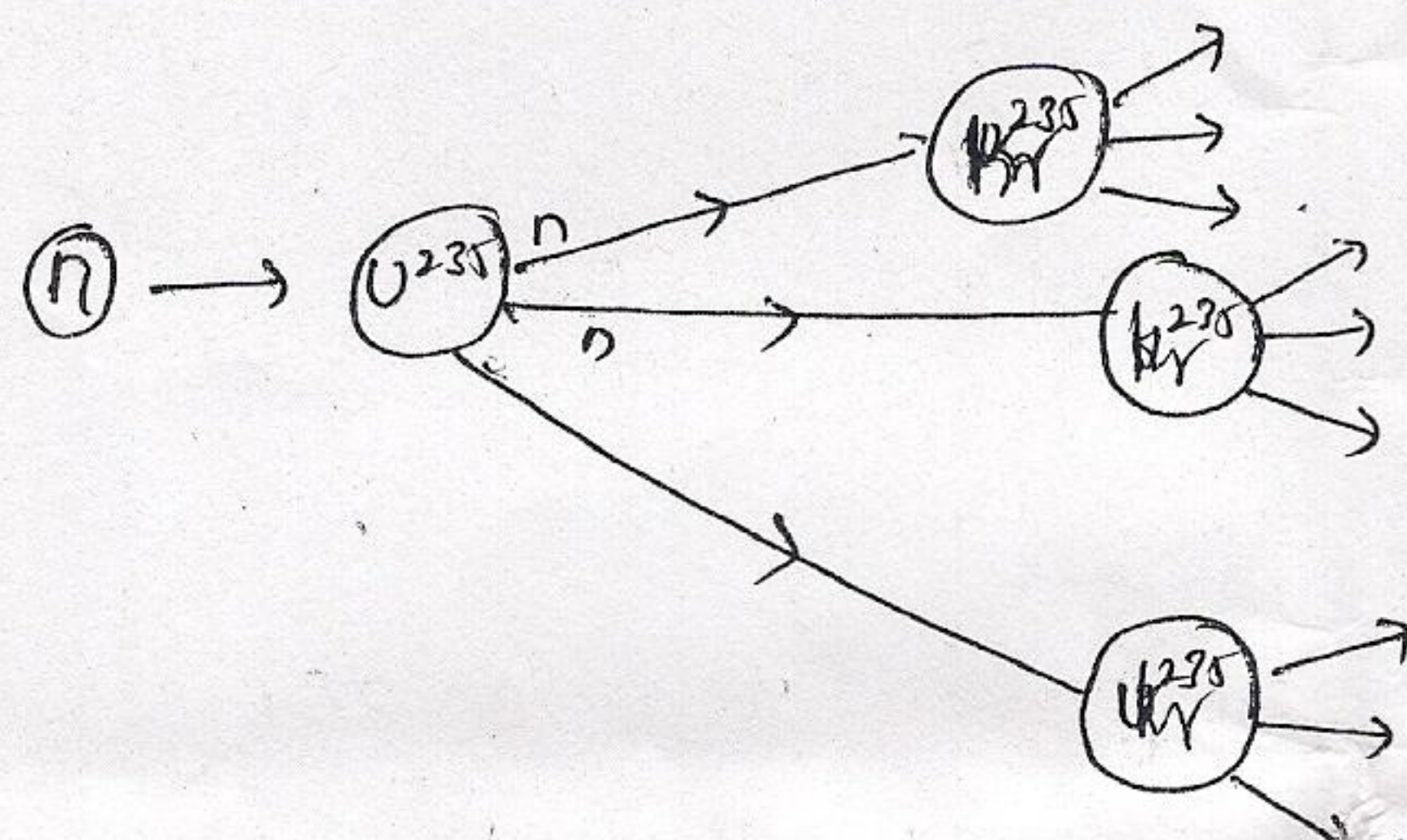
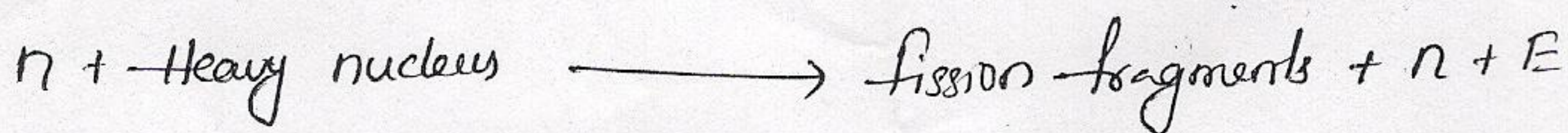
Nuclear fission :-

The nucleus of an element is broken into two or more nucleus and release sufficient amount of energy.

eg: U-235, Pu-239.

The isotopes of a given element contains different no of neutrons but the same no of protons & electrons

The fission process is accompanied by release of energy and neutrons.



Nuclear fission and chain reaction.

