SCIENCE

INTRODUCTION, CLASSIFICATION OF NATURAL RESOURCES, AIR AND ATMOSPHERE

INTRODUCTION

- Nature provides us the basic needs like food, shelter, clothes etc for our survival.
- We use air, water, soil, minerals, coal, petroleum, plants and animals etc in our daily life to fulfil our needs and even comforts of life.
- But have you ever thought what these materials present in nature are? These materials are basically called **natural resources**.

(i) **Natural resources:** Natural resources refer to all the natural things on our earth, such as soil, air, water, minerals, coal, sunlight etc. Human being uses these directly or indirectly for survival and welfare.

(ii) **Artificial resources :** The resources, which have been developed by human beings, are called artificial resources. For example, biogas, thermal electricity, plastics etc are man-made resources.

Do you know?

(i) Prof. Ramdeo Misra is called as the father of Ecology.

(ii) A species is a group of interfertile or interbreeding organisms.

Do you know?

(i) Inexhaustible natural resources include solar energy, wind power, rainfall etc.

(ii) Renewable exhaustible natural resources include underground water, soil fertility etc.

(iii) Non-renewable exhaustible natural resources include minerals, fossil fuels etc.

TYPES OF NATURAL RESOURCES

- The air we breathe, the water we drink, and the light we get from the Sun are actually available in unlimited quantities.
- What about coal, petroleum and forest? Are they found in huge quantity?
- No, the stock of these resources are limited and their quantities are depleting day by day.

- For this reason, these resources need to be wisely used. However, in reality it is not so. They are being used indiscriminately.
- But then how long these precious materials of the nature will he available for our use?
- The tremendous population growth, the industrial progress and rapid urbanization have created heavy demand on all these materials. So, sooner or later, these resources would get depleted.
- **On the basis of availability, natural resources are classified into two types:**

1. Inexhaustible resources:

- The resources that are present in unlimited quantity in nature are called inexhaustible resources. They are not likely to be exhausted by human activities. *For example*: Air, water, Solar rays, etc.

2. Exhaustible resources:

- The resources that are present in limited quantity in nature are called exhaustible resources. They are likely to be exhausted by human activities. For example, coal, petroleum, plant, animals etc.

Exhaustible resources are further classified into two types :

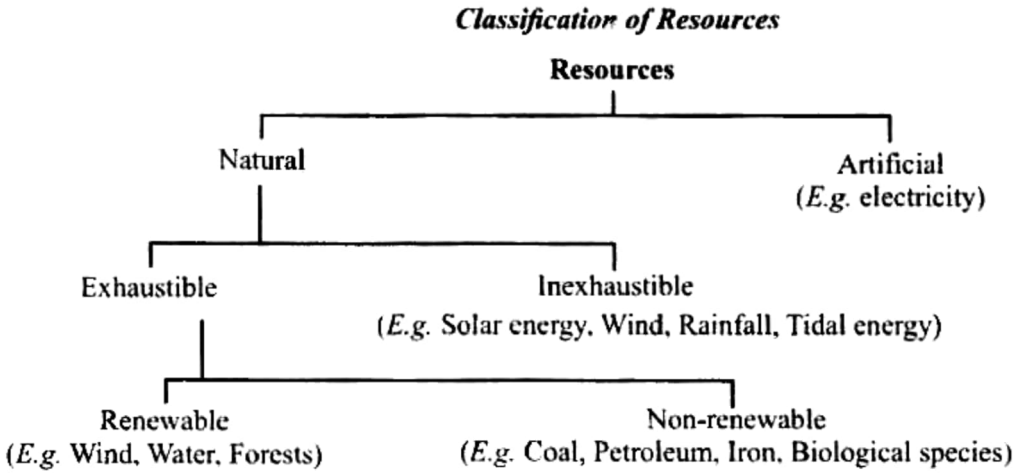
(i) Renewable resources:

- Exhaustible resources that can replenish themselves by quick recycling and replacement within a reasonable time are known as **renewable resources**. *For example*, the living beings reproduce and can thus replace the killed individuals.
- However, if the consumption of these resources exceeds the rate of regeneration, it may also get totally exhausted. *Few more examples: Soil, forests, wildlife, vegetation, etc*.

(ii) Non-renewable resources:

- The resource which cannot be replaced by recycling and replacement is known as **non-renewable resources**.
- Its increased consumption will result in quicker exhaustion. *Examples:* Coal, petroleum, minerals like copper, iron etc.

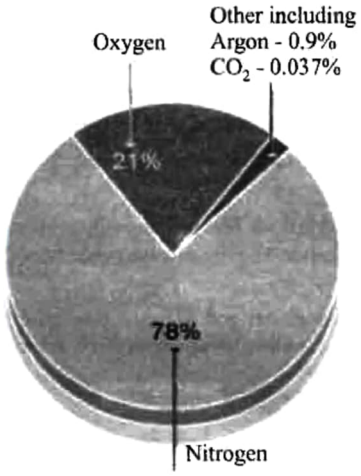
CLASSIFICATION



AIR - THE BREATHE OF LIFE

Air is an inexhaustible natural resource. It is essential for the survival of all the living organisms on earth. It is found everywhere. It is a mixture of different gases, which we cannot see. It is also necessary for all living organisms because they breathe in air. Hence, air is called the breath of life as life cannot exist without air.

The major components of air are nitrogen and oxygen while minor components are carbon dioxide, Argon, and traces of Helium, neon, krypton, ozone etc.



Composition of Air

- This composition is very crucial in the maintenance of life on earth.
- This can be understood from the fact that in planets like Mars and Venus which are somewhat similar to Earth, life is not present because the CO_2 composition is as high as 95-97%.
- On earth, the percentage of CO_2 is about 0.03%.
- This amount is balanced by two simultaneous activities happening concomitantly.
- CO_2 is produced by

(i) Some prokaryotic and all eukaryotic cells as the result of oxidation of food.

(ii) Combustion due to human activities.

(iii) Combustion due to natural activities like forest fires.

- However, CO_2 is consumed by

(i) Green plants that uses CO_2 to convert it into glucose in the presence of sunlight.

(ii) Some marine animals, that use the carbonates dissolved in sea-water to make their shells. These shells help them as a protective armour.

ATMOSPHERE AND CLIMATE CONTROL

Atmosphere contributes greatly to control the climate, though it is not the only factor in doing so.

It keeps the average temperature of earth fairly steady during the day and even during the course of the whole year. It prevents the sudden fluctuation in day and night temperature.

Moon, which is at nearly the same distance from sun as that of earth has no atmosphere.

Its temperature rises very high during the sunlight period (day) to about 110ºC and cools to –190°C during dark period (night).

ATMOSPHERE

The envelope of air that surrounds the earth is called the **atmosphere**.

Air is dense below near the surface of earth.

It becomes progressively rare with height. The height to which atmosphere extends is 500 km.

Atmosphere is divisible into four layers.

(i) **Troposphere:** It is the lower part of atmosphere which extends up to a height of 8-16 km. It is the most active region, which contains about 18% of the total mass of air. All

the dramatic events of the weather such as air movements, water vapours, cloud formation and dust particles are restricted to it.

(ii) **Stratosphere:** It is found above the troposphere upto a height of 30-50 km. This zone is rich in ozone. Hence, it is also known as ozone layer or ozonosphere.

(iii) **Mesosphere:** It is found above the stratosphere and extends up to a height of 100 km.

(iv) **Thermosphere:** The atmosphere, between 100 to 500 km, is called thermosphere. There is progressive increase in temperature in this region. This high temperature and high energy radiation cause ionization of gases. This layer of ionized particles is known as ionosphere. Ionosphere is radio-reflective and is important for tele-communication on earth.

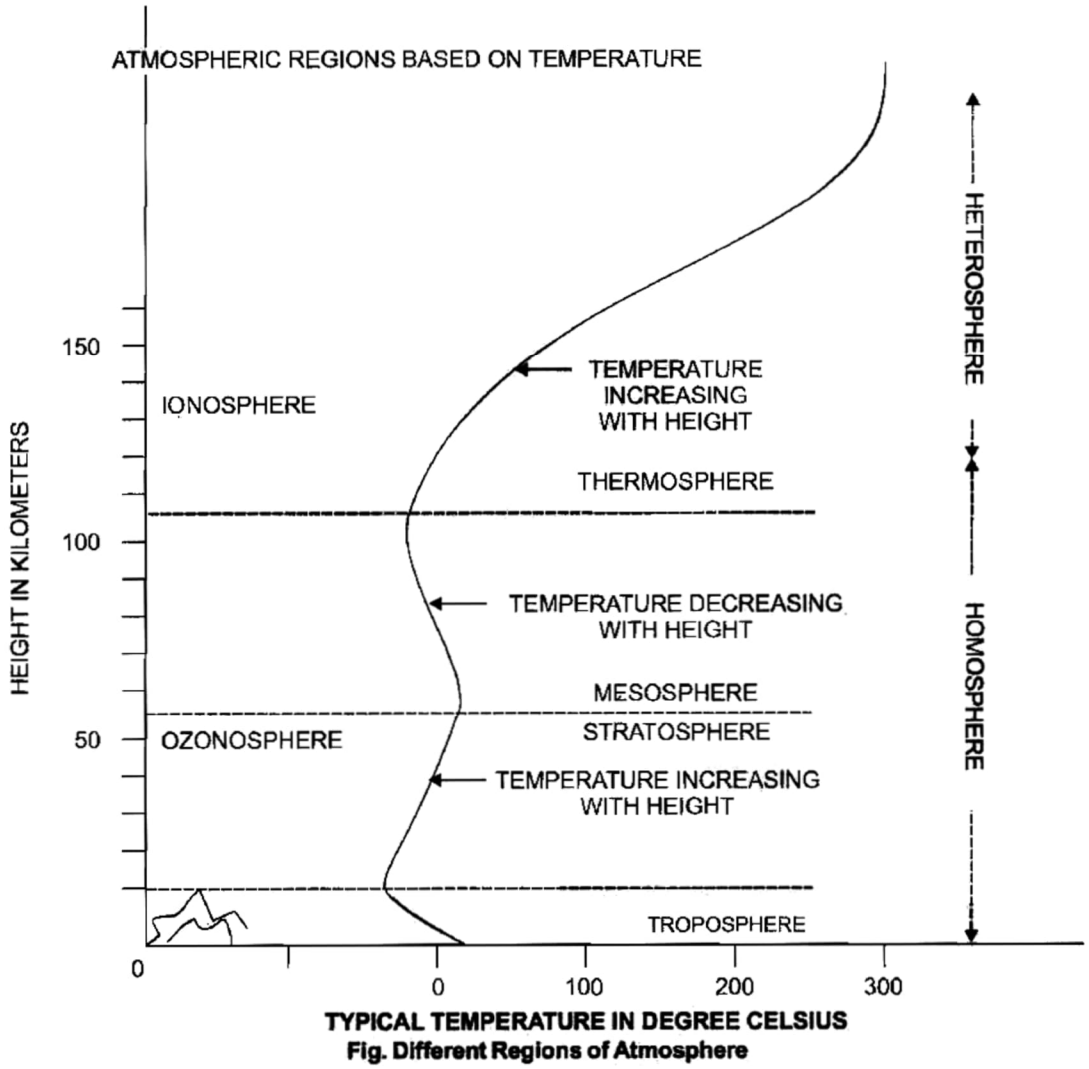


Fig. Different Regions of Atmosphere