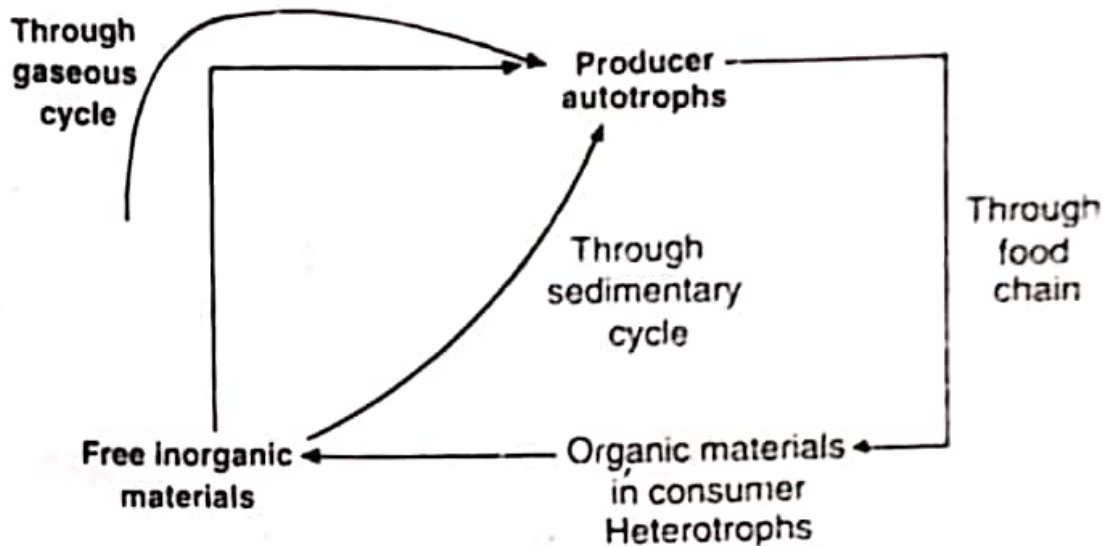


# BIO-GEOCHEMICAL CYCLE

Bio-geo chemical cycle may be defined as circulation of chemical elements and minerals including all essential elements of protoplasm from environment to organism and back to the environment in cyclic manner.



There are two types of bio-geochemical cycle—

(1) **Gaseous cycle**—Carbon, Nitrogen, Oxygen cycle.

(2) **Sedimentary or Mineral cycle**—*e.g.*, Sulphur, Phosphorus, Cycles etc.

**Hydrological cycle**—

Water cycle is the most important cycle providing the Solvent medium.

The Water from the surface of lakes, rivers and seas evaporate by solar energy and forms

clouds after condensation and precipitates as rain and snow fall. In which some portions are absorbed by plants and animals and rest of the

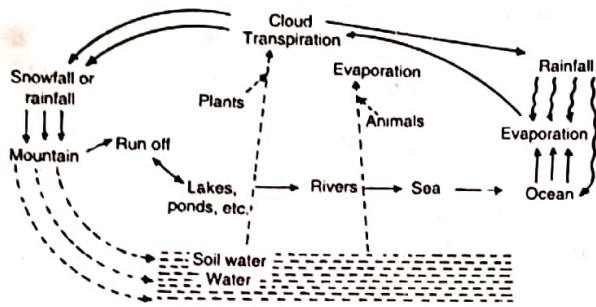
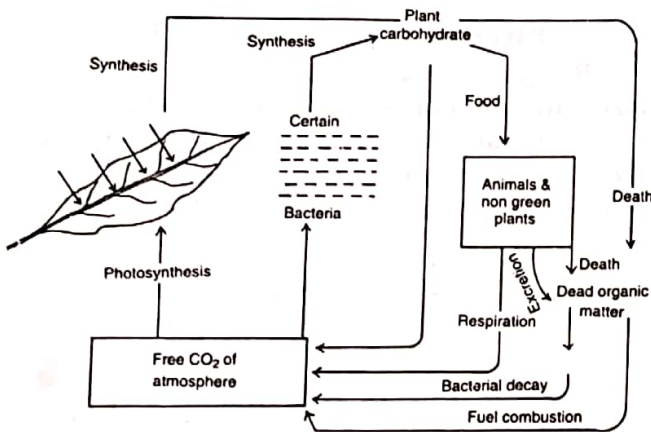


Fig. : Details of water cycle.

water moves directly or indirectly in ocean through sea.

But the soil water is absorbed by plants and which return in atmosphere during transpiration.

**Carbon cycle—**



Carbon is a basic element of all organic compounds in the living community. Carbon moves from environment in term of CO<sub>2</sub> into producers in the process of photosynthesis. From it into consumers community, then to decomposers from both the trophic levels and finally returns to the environment.

The percentage of CO<sub>2</sub> in the air is very small ranging from 0.03 to 0.04%.

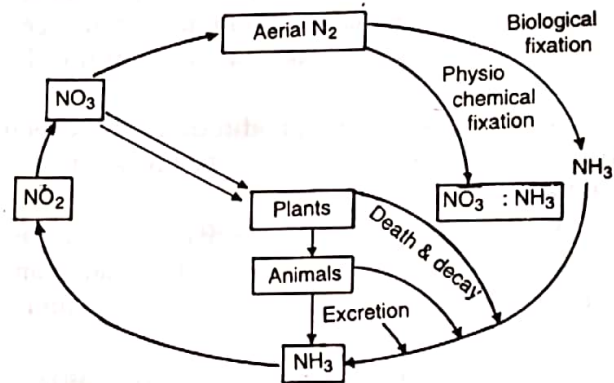
**N<sub>2</sub> Cycle—**Nitrogen is an essential elements in the living substances like protein, nucleic acid and other nitrogenous bases and present 79% in free state in atmosphere but plants and animals cannot use gaseous nitrogen.

**NITROGEN CYCLE**

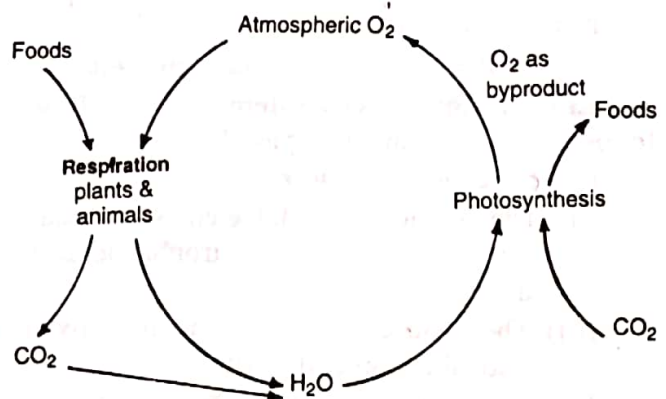
Circulation of nitrogen atoms, brought about mainly by living organisms. Inorganic nitrogenous compounds (Chiefly nitrates) are absorbed by autotrophic plants from soil or water and synthesized into organic compounds. These autotrophs die and decay or are eaten by animals and the nitrogen, still in the form of organic compounds (e.g., proteins, nucleic acids), returns to the soil or water via excretion or death and decay. Ammonifying and nitrifying bacteria then convert them to inorganic compounds. Some nitrogen is lost to the atmosphere as nitrogen gas by denitrification. A great deal is extracted from the atmosphere by N-fixing bacteria and blue-green algae. Lightning causes oxygen and nitrogen to react, producing oxides of nitrogen which react with water to form nitrate ions, adding nitrogen to the soil.

Animal use to take it as amino acid and plant in the form of soluble nitrogen salts. Thus gaseous nitrogen is converted into useful form in following steps—

- (i) Nitrogen fixation.
- (ii) Nitrification.

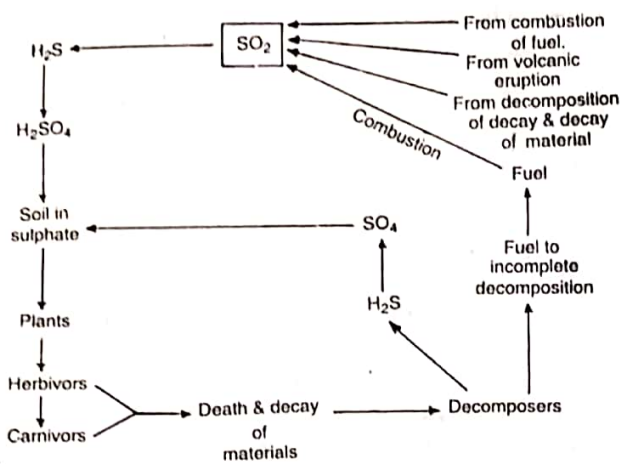


**Oxygen cycle—**



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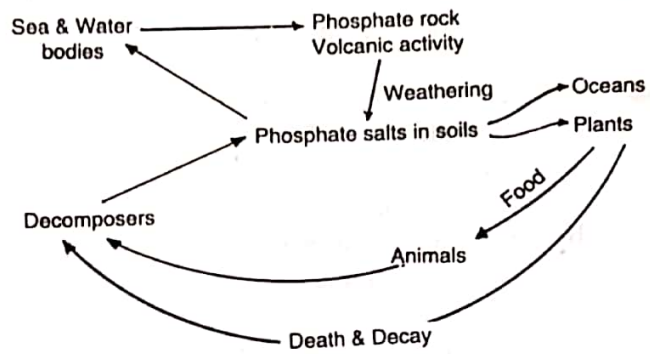
**Sedimentary cycle—  
1. Sulphur cycle—**



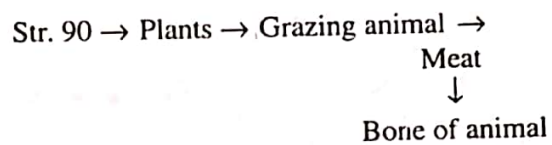
Sulphur usually enter into atmosphere in the form of  $H_2S$  which is quickly oxidised into  $SO_2$  which is soluble in water and goes to earth with the rain water as a weak  $H_2SO_4$  which convert in sulphate salts in soil then taken through plants root and turned synthesised into amino acid, proteins and then transferred to consumer after that to decomposer inform of excretory materials and death and decay matter.

**2. Phosphorus cycle—**Phosphorus is a very important as being energy carriers in the form of

ATP. It occurs naturally in the environment as phosphate but not in gaseous state.



**Cycling of Toxic element—**Some radioactive elements are added to bio-geochemical cycle due to nuclear reaction both due to fusion and fission and which toxic for human being.



**Conclusion—**Thus we see that bio-geochemical cycle plays a vital role in maintaining the mass of different elements e.g., Carbon, Hydrogen, Nitrogen, Phosphorus, Oxygen, Sulphur through a proper cycle of Producer, Consumer, Decomposer and again to producer.