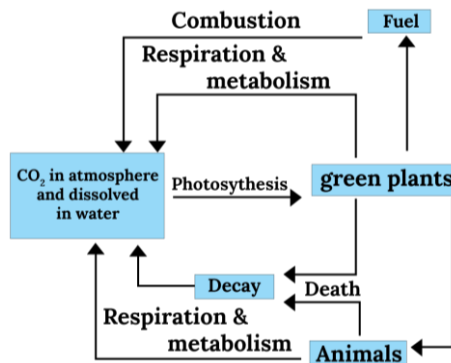


- b. **Carbon Cycle:** It involves a continuous exchange of carbon between the atmosphere and organisms. It is usually a short-term cycle. Respiration, decay and volcanic actions are some factors that add CO_2 to the Carbon Cycle.



Carbon Cycle

- c. **Nitrogen Cycle:** Nitrogen is converted into many chemical forms as it circulates from the atmosphere to the soil to organism and back into the atmosphere.

- i. **Nitrogen fixation:** They are accomplished in three different ways: by microorganisms like bacteria and blue-green algae, by man using industrial process like fertilizer factories and to a limited extent by atmospheric phenomenon like thunder and lighting.

Certain microorganisms are capable of fixing atmospheric nitrogen into ammonium ions. These are free living nitrifying bacteria (e.g., aerobic azotobacter and anaerobic clostridium) and symbiotic nitrifying bacteria living in association with leguminous plants and symbiotic bacteria living in non-leguminous root nodule plants (e.g., rhizobium) as well as blue green algae (e.g., anabaena, spirulina)

- ii. **Nitrification:** Ammonium ions are oxidized to nitrites or nitrates by two specialized bacteria; Nitrosomonas bacteria to promote ammonia transformation into nitrite, which is then further transformed into nitrate by the bacteria Nitrobacter.
- iii. **Denitrification:** Special denitrifying bacteria pseudomonas convert nitrites/nitrates to elemental nitrogen.

