

Note: - Various books of **Environmental Economics and other subjects** also available **free of cost** on **Libgen**. Students can download.

## **M.Com (Applied Economics)** **Semester- IV**

### **Paper- Environment and Resource Economics**

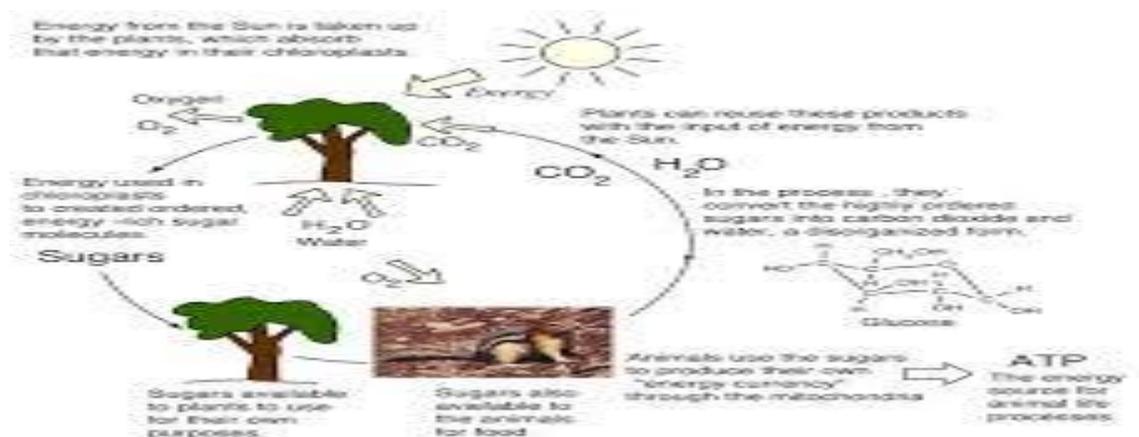
#### **Topic: Energy and various cycles in the Ecosystem**

Role of energy in the ecosystem is very important because every organism always has need and take energy in different way from other organism. This process has been done in various energy cycles in the ecosystem. So, in the nature many cycles of ecosystem has several interrelated energy mechanism that affect human and all other organism life. Therefore many energy cycles always functioning in the ecosystem are as:

- 1- Energy cycle
- 2- The Water cycle
- 3- The carbon cycle
- 4- The Oxygen cycle
- 5- The Nitrogen cycle

#### **The Energy Cycle:**

The energy cycle is based on the flow of energy through the ecosystem. The energy from sunlight is converted by plant them into growing new plants material which include the flowers, fruits, branches, trunks and roots of the plants. Since plants can grow by converting the sun energy directly into their tissues. They are known as producer in the ecosystem.



Source: <http://hyperphysics.phy-astr.gsu.edu/hbase/Biology/imgbio/treecycle.png>

So the energy in the ecosystem can be depicted in the form of a food pyramid or energy pyramid. The food pyramid has large based plants called producers. The pyramid has a

narrower middle section that depicts the number and biomass of herbivores animals, which called first order consumers. Man is one of the animals at the apex of the pyramid.

### **The Water Cycle:**

The water is the most important component of ecosystem. All living organism used water to grow and survive in an ecosystem. The water cycle through the atmosphere, soil, rivers, lakes and oceans. When it rains the water runs along the ground and flows into river or falls directly in to the sea.

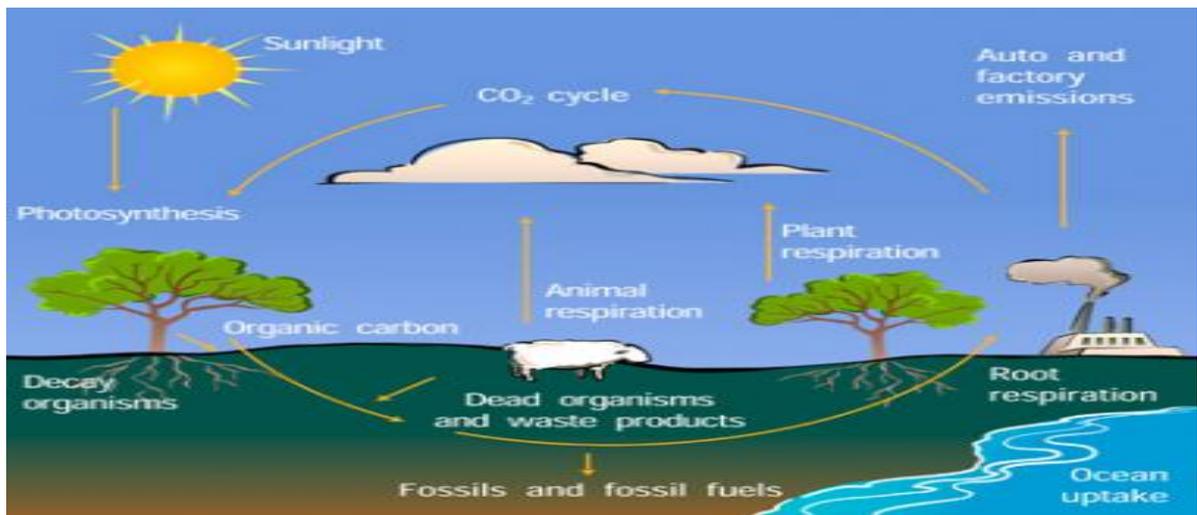


Source:<https://ourglobalclimate.com/wp-content/uploads/2018/07/water-cycle-1-1080x675.jpeg>

A same parts of the rain water that falls on land percolates into the ground. Water is drawn up from the ground by plants along with the nutrients from the soil. The water is then transferred from the leaves as water vapour and return to the atmosphere. But while this is an endless cycle on which life depends, human activities are making.

### **The Carbon Cycle:**

It is very important to all sea system and ultimately life on earth. On the earth living tissue contains carbon because they contain many types of proteins, fats and carbohydrates. The carbon in these (living or dead) tissues is recycled in the various process. So the carbon cycle, in biology circulation of carbon in various forms through nature. Carbon hold all organic compounds and many of which are essential for life on the earth. The source of the carbon found in living matter is carbon dioxide in the air or dissolved in water. All of mankind depends on the oxygen generated through this cycle. It also keeps the  $\text{CO}_2$  at acceptable levels.

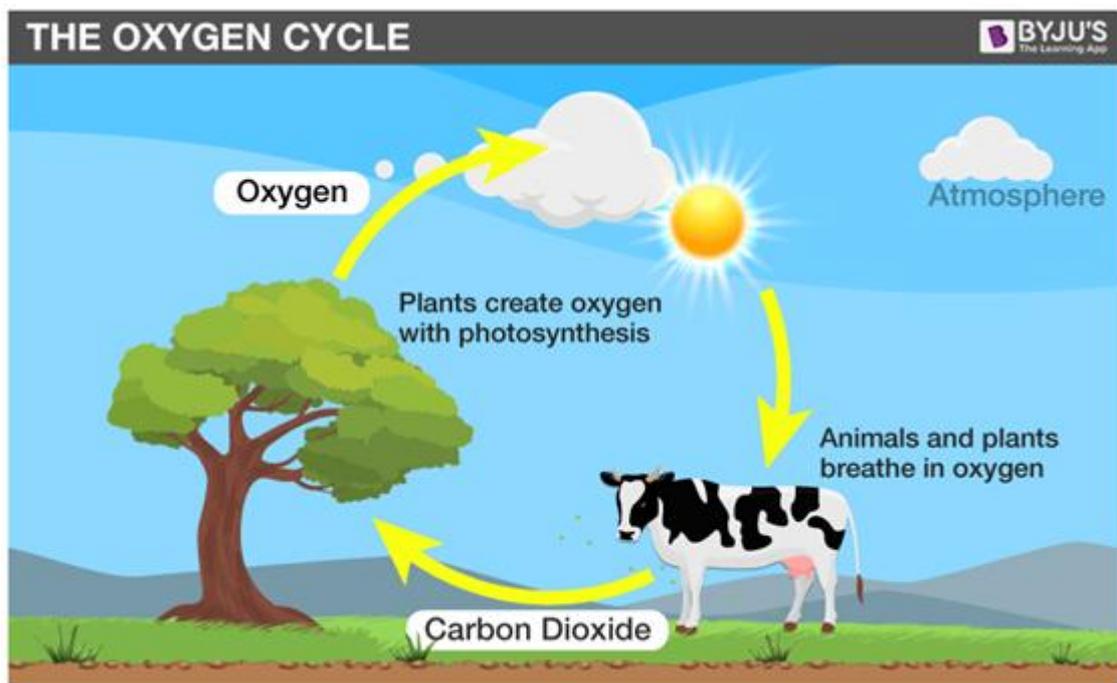


Source: [https://scied.ucar.edu/sites/default/files/images/large\\_image\\_for\\_image\\_content/carbon\\_cycle\\_diagram\\_ucar\\_620x600.jpg](https://scied.ucar.edu/sites/default/files/images/large_image_for_image_content/carbon_cycle_diagram_ucar_620x600.jpg)

The carbon returns to the atmosphere when the plants decay, eaten and digested by animals or burn in fires, because plant and animals are an integral part of this cycle, because both plants and animals release carbon dioxide during respiration. They also return fixed carbon to the soil. So as ecosystem change under a changing climate, the carbon cycle will also be change.

**The Oxygen Cycle:**

Oxygen is absorbed by plants and animals from the air during respiration. Basically the oxygen cycle is the biogeochemical cycle of oxygen within its four main reservoirs. The atmosphere (air), the total content of biological matter within the biosphere, the hydrosphere (the combined mass of water found under and over the surface of planet) and the lithosphere.

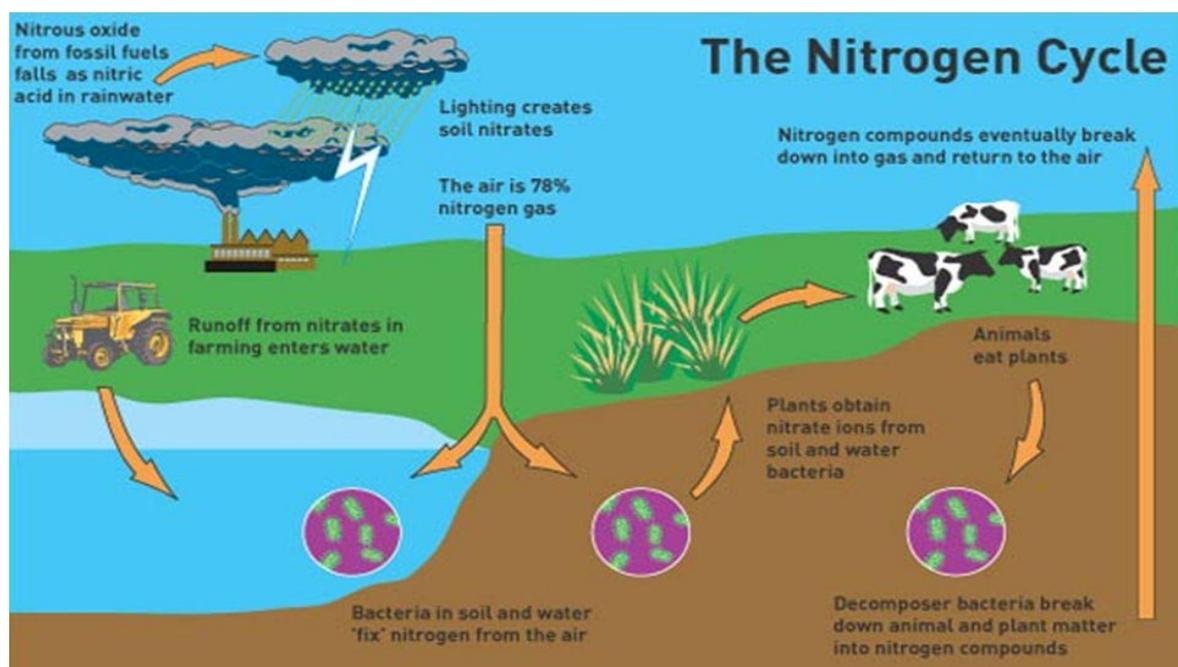


Source: <https://cdn1.byjus.com/wp-content/uploads/2018/02/Oxygen-Cycle-min.png>

The main driving factor of the oxygen cycle is photosynthesis, which is responsible for the modern earth atmosphere. So the plant life plays an important role in our life, which we frequently do not appreciate. This is an important reason to participate in forestation programs.

### **The Nitrogen Cycle:**

The nitrogen fixing bacteria and fungi in the soil give this important element to plants which absorb it as nitrates. These nitrates are part of the plants metabolism, which help in forming new plant proteins. This is used by the animals that feed on the plants. The nitrogen in them transferred to the carnivores when they feed on the herbivores.



Source: [https://images.slideplayer.com/28/9370256/slides/slide\\_5.jpg](https://images.slideplayer.com/28/9370256/slides/slide_5.jpg)

So, the nitrogen cycle describes how nitrogen moves between plants, animals, bacteria, the atmosphere and soil in the ground. So nitrogen is an important element for all lives on earth. This cycle is biogeochemical cycle by which nitrogen is converted into multiple chemical forms as it circulates among atmosphere, terrestrial and marine eco system.

*Note: This is brief information Ecosystem and other components while also students advised to collect more information for the same from other sources like text books, reference books and Google search.*