

www.vishnuias.com



Topic Wise Content



<https://t.me/vishnuiasmentor>

You Tube

<https://www.youtube.com/channel>

Carbon Sequestration

Notes for civil services preparation



UPSC

General Studies

Carbon Sequestration

There has been **increasing investments to develop technology** in the field of **Carbon Sequestration** and fight the menace of **climate change**.

Key Points

- **Need:**
 - As Global Warming accelerates and society continues to emit greenhouse gases, the idea is gaining of investing in **artificial techniques of Carbon Sequestration**.
 - According to the **Intergovernmental Panel on Climate Change**, nations may need to remove between **100 billion and 1 trillion tonnes of carbon dioxide** from the atmosphere this century to **avert the worst effects of climate change**, far more than can be absorbed by simply planting more trees.
- **About:**
 - Carbon sequestration is the **long-term storage of carbon in plants, soils, geologic formations, and the ocean**.
 - Carbon sequestration **occurs both naturally and as a result of anthropogenic activities** and typically refers to the storage of carbon.
- **Types:**
 - **Terrestrial Carbon Sequestration:**
 - Terrestrial carbon sequestration is the process through which CO₂ from the atmosphere is **absorbed by trees and plants through photosynthesis and stored as carbon** in soils and biomass (tree trunks, branches, foliage, and roots)
 - **Geologic Carbon Sequestration:**
 - CO₂ can be stored, including **oil reservoirs, gas reservoirs, unmineable coal seams**, saline formations and shale formations with high organic content.
 - **Ocean Carbon Sequestration:**
 - Oceans absorb, release and store large amounts of CO₂ from the atmosphere. This can be done in two ways- **enhancing**

productivity of ocean biological systems through **Iron fertilization**, and **injecting CO₂** into the deep ocean.

- The dumping of iron stimulates phytoplankton production, which in turn leads to enhanced photosynthesis from these microorganisms, helping in CO₂ absorption.

▪ **Methods:**

○ **Natural Carbon Sequestration:**

- It is the process by which nature has achieved a **balance of carbon dioxide in our atmosphere suitable** for sustaining life. Animals expel carbon dioxide, as do plants during the night.
- Nature provided **trees, the oceans, earth and the animals themselves as carbon sinks, or sponges**. All organic life on this planet is carbon based and when plants and animals die, much of the carbon goes back into the ground where it has little impact on contributing to global warming.

○ **Artificial Carbon Sequestration:**

- Artificial carbon sequestration refers to a **number of processes** whereby **carbon emissions are captured at the point of production (e.g. Factory Chimneys) and then buried**.
- One proposed method is ocean sequestration whereby carbon dioxide is **injected deep into the ocean**, forming **lakes of CO₂**. In theory, the CO₂ will stay down deep due to the pressure and temperature of the surrounding water, gradually dissolving into that water over time.
- Another example is **geological sequestration** where the carbon dioxide is **pumped into underground chambers such as old oil reservoirs, aquifers and coal seams that are unable to be mined**.