Ocean Carbon Sequestration

Why in news?

While researchers are exploring ways to pull carbon dioxide out of the atmosphere and lock it in the ocean, it raises serious technical, social and ethical questions.

What is carbon sequestration?

- Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide.
- It is one method of reducing the amount of carbon dioxide in the atmosphere.
- **Geologic carbon sequestration** - It is the process of storing carbon dioxide (CO2) in underground geologic formations.
- The CO2 is usually pressurized until it becomes a liquid, and then it is injected into porous rock formations in geologic basins.
- **Biologic carbon sequestration** - It refers to storage of atmospheric carbon in vegetation, soils, woody products, and aquatic environments.

What is ocean carbon dioxide removal about?

> *The ocean covers about 70% of the planet, and it naturally takes up carbon dioxide. About a quarter of human-produced carbon dioxide ends up in the ocean.*

- Ocean carbon dioxide removal is any action designed to use the ocean to remove even more carbon dioxide from the atmosphere than it already does and store it.

- Short-lived biomass like kelp forests or phytoplankton, may not keep captured carbon stored for more than a few decades because most plant tissues are quickly recycled by decay or by grazing of sea creatures.
- Mechanisms that form minerals (when carbon dioxide is pumped into basalt formations), or alter the way seawater retains carbon dioxide (increasing its alkalinity), etc. prevent carbon from escaping and are more likely to keep it out of the atmosphere for hundreds of years.

What are the risks and benefits?

Benefits of ocean carbon dioxide removal

- Options, such as supporting mangrove forests, may promote biodiversity and benefit

nearby human communities.
- The ocean has virtually unlimited potential for CO_2 storage.
- Ocean carbon dioxide removal does not compete for space with other land uses.
- Ocean carbon dioxide removal targets and accelerates natural sequestration processes.

Risks in ocean carbon dioxide removal

- Growing and then sinking large amounts of kelp or algae could bring in invasive species.
- Dissolving certain types of rock in the ocean could reduce ocean acidity.
- These rocks could also contain trace amounts of metals that could harm marine life.
- Each process could also release some greenhouse gases, reducing its overall effectiveness.
- Boosting algae growth could affect nearby wild fisheries or interfere with recreation.
- It is less clear how decisions about the high seas or deep ocean would be made, since these areas are not under the jurisdiction of any one country or global governing body.
- Ocean carbon dioxide removal could be very expensive.

References

1. Down to Earth | Using the ocean to fight climate change
2. Climate Works Foundation | Ocean carbon dioxide removal
3. Ocean Visions | Ocean-Based Carbon Dioxide Removal
4. USGS | Carbon sequestration

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