

## 4.1 CLIMATE CHANGE AND CARBON CREDITS

Climate change is a significant global challenge, primarily driven by the increase in greenhouse gas emissions, particularly carbon dioxide (CO<sub>2</sub>), from human activities such as burning fossil fuels, deforestation, and industrial processes. One approach to mitigate climate change is through the use of carbon credits.

Carbon credits are a market-based mechanism aimed at reducing greenhouse gas emissions. They work on the principle of putting a price on carbon emissions to incentivize reductions. Here's how they generally work:

1. **Carbon Emissions Reduction:**

Companies or projects that reduce greenhouse gas emissions can earn carbon credits. These reductions can be achieved through various means such as investing in renewable energy, improving energy efficiency, or implementing carbon capture and storage technologies.

2. **Issuance of Carbon Credits:**

Once the emissions reduction is verified, carbon credits are issued to the entity responsible. Each carbon credit represents the removal or reduction of one metric ton of CO<sub>2</sub> or its equivalent in other greenhouse gases.

3. **Trading and Compliance:**

Carbon credits can be bought and sold on carbon markets. Companies that emit greenhouse gases beyond a certain limit may be required by regulations to purchase carbon credits to offset their emissions, thus creating a financial incentive to reduce emissions.

4. **Offsetting Emissions:**

Buyers of carbon credits can use them to offset their own emissions, thus achieving carbon neutrality or compliance with regulatory requirements.

5. **Support for Sustainable Practices:**

The revenue generated from selling carbon credits can support sustainable practices and projects, contributing to further emissions reductions and environmental benefits.

While carbon credits can play a role in reducing emissions, they are not without criticism. Some argue that they may allow companies to continue polluting without making significant changes to their operations. Additionally, the effectiveness of carbon markets depends on robust monitoring, reporting, and verification mechanisms to ensure the integrity of emissions reductions. Overall, carbon credits are one tool among many in the fight against climate change, and their effectiveness depends on how they are implemented and integrated into broader climate mitigation strategies.

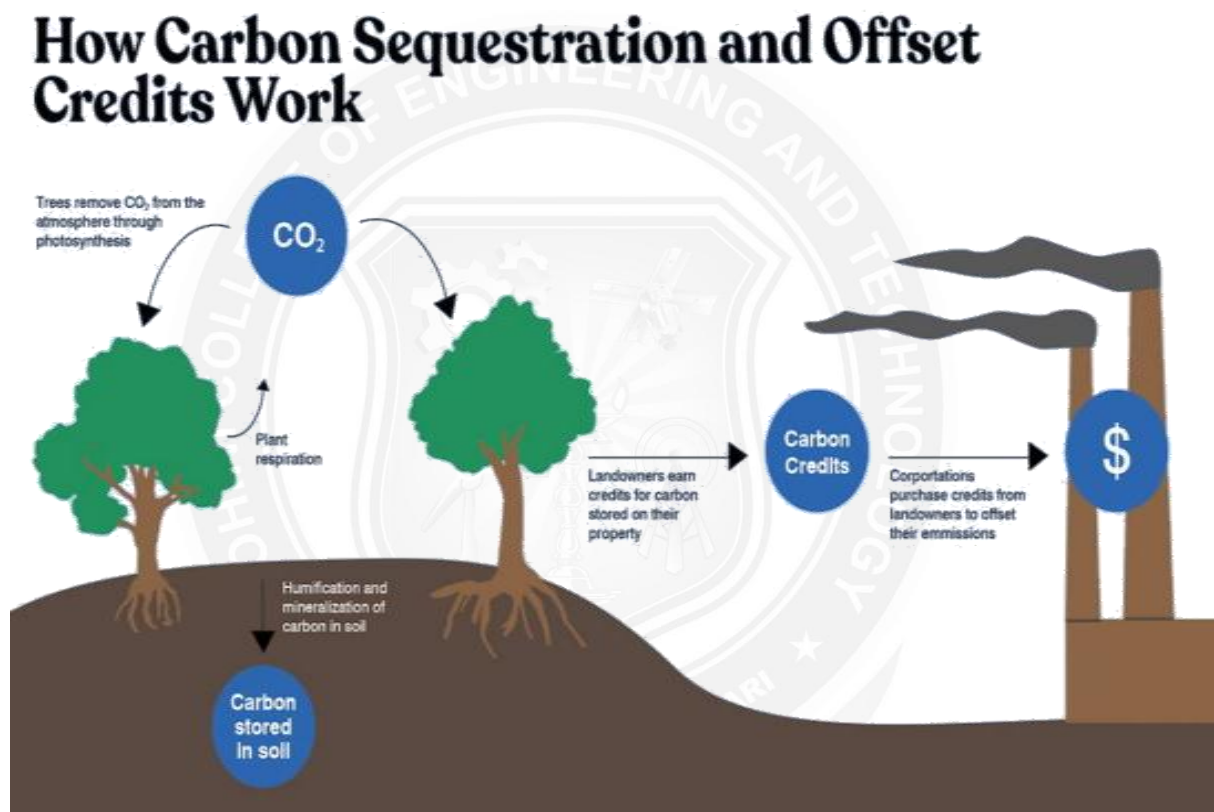


FIG.4.1.1 Climate Change And Carbon Credits

**How carbon credits work in the context of addressing climate change:**

### 1. Renewable Energy Projects:

A company invests in building a wind farm that generates clean electricity, displacing the need for electricity generated from fossil fuels. The emissions avoided by using renewable energy can be quantified, and the company can earn carbon credits for these avoided emissions. These credits can then be sold on the carbon market to other companies looking to offset their emissions.

### 2. Reforestation Initiatives:

3. An organization undertakes a project to reforest degraded land, which absorbs CO<sub>2</sub> from the atmosphere as trees grow. The amount of carbon sequestered by the new forest can be measured, and the organization can earn carbon credits based on the amount of CO<sub>2</sub> removed from the atmosphere. These credits can be sold to companies or governments seeking to offset their emissions and support forest conservation efforts.

4. **Energy Efficiency Upgrades:**

A manufacturing facility implements energy-efficient technologies and practices to reduce its energy consumption and associated greenhouse gas emissions. The emissions reductions achieved through these upgrades can be quantified, and the facility can earn carbon credits for the reduced emissions. These credits can be used to offset the facility's own emissions or sold on the carbon market.

5. **Carbon Capture and Storage (CCS) Projects:**

A power plant installs carbon capture technology to capture CO<sub>2</sub> emissions from its exhaust streams before they are released into the atmosphere. The captured CO<sub>2</sub> is then stored underground in geological formations, preventing it from contributing to climate change. The facility can earn carbon credits for the CO<sub>2</sub> captured and stored, incentivizing investment in CCS technology.

6. **Community-Based Projects:**

In some cases, carbon credit projects are developed in collaboration with local communities, providing additional benefits beyond emissions reductions. For example, a project might involve distributing clean cookstoves to households in a developing country, reducing emissions from traditional biomass cooking methods while improving indoor air quality and health outcomes for the community members. The emissions reductions from the use of clean cookstoves can earn carbon credits, which can be used to support the ongoing distribution and maintenance of the stoves.

These examples highlight the diverse range of projects that can generate carbon credits and contribute to mitigating climate change while also delivering additional environmental, social, and economic benefits.

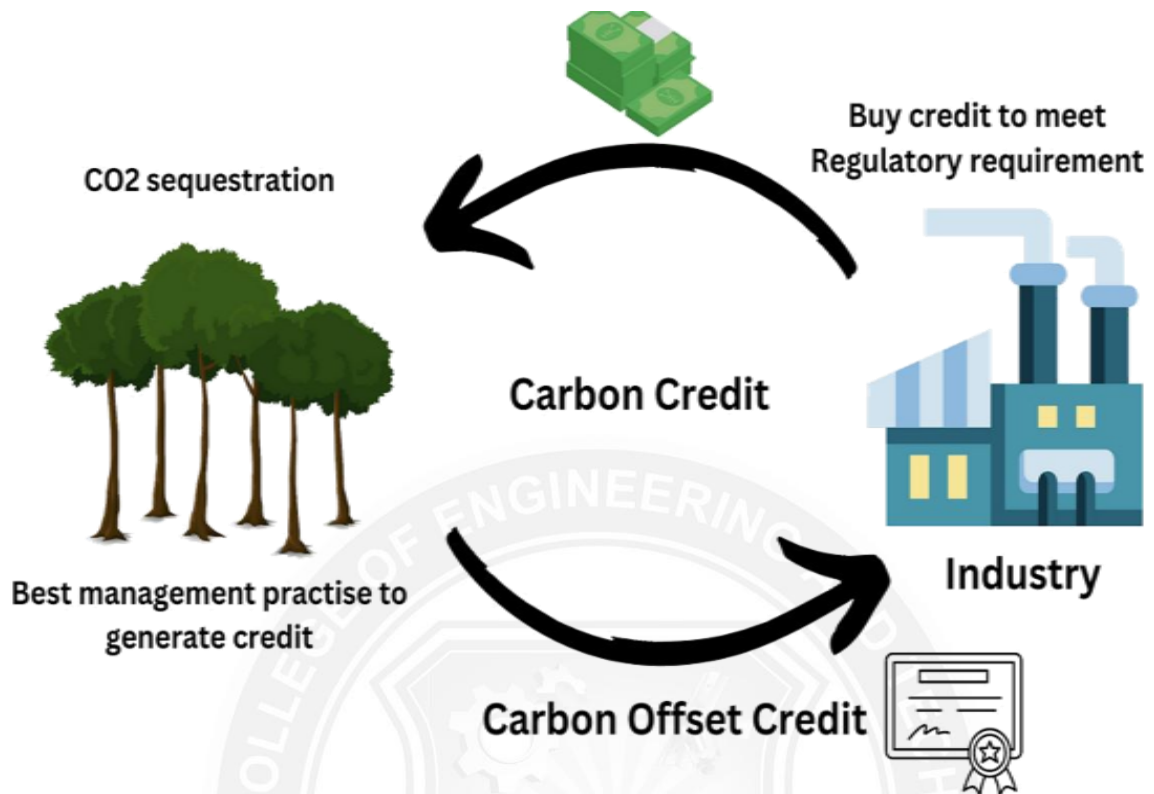


FIG.4.1.2 Climate Change And Carbon Credits