Carbon Farming

Why in news?

Carbon farming offers a multifaceted approach to address climate change while simultaneously enhancing agricultural productivity and ecosystem health.

What is carbon farming?

- **About**- It is an *integrated approach* to enhance *carbon sequestration* in agriculture.
- **Objective-**The primary goal of carbon farming is to *reduce the net carbon content* in the atmosphere, this is achieved by increasing the rate at which carbon is sequestered into soil and plant materials.



- **Agroecosystem processes**- It involves adopting farming practices that increase the rate of CO_2 capture from the atmosphere and its storage in plant matter and soil organic matter.
- **Whole farm approach**- It is a comprehensive strategy that applies to all aspects of farm's operations with the goal to maximize the removal of CO_2 from the atmosphere.

What is the significance of carbon farming?

- **Regenerative practices**- It incorporates regenerative agricultural practices such as rotational grazing, agroforestry, conservation agriculture, integrated nutrient management, agro-ecology, livestock management, and land restoration.
- **Ecosystem resilience**- The regenerative practices restore ecosystem health, improve soil fertility, and enhance carbon storage in agricultural landscapes.
- **Diverse techniques-** It encompasses a wide range of techniques suitable for various agro-climatic zones such as silvopasture, alley cropping, zero tillage, crop rotation, cover cropping, and livestock management strategies like rotational grazing.
- **Mitigate climate change**- By sequestering carbon in vegetation and soil, carbon farming helps mitigate climate change by reducing greenhouse gas emissions.
- **Enhance soil health**- Carbon farming practices, such as cover cropping, conservation agriculture, and organic farming, improve soil health by increasing organic matter content, enhancing soil structure, and promoting microbial activity.
- **Biodiversity conservation**- Many carbon farming practices, such as agroforestry and crop diversification, promote biodiversity by providing habitat and resources for a wide range of plant and animal species.
- **Water management**-Some carbon farming practices, such as agroforestry and soil conservation techniques, help improve water management by reducing soil erosion, enhancing water infiltration, and minimizing runoff.

Global carbon farming schemes
• **Carbon trading initiative**-It is followed in countries like the U.S., Australia, New Zealand, and Canada where the carbon credits generated in agricultural practices that reduce GHG emission or increase carbon sequestration are traded in the market. • **Chicago climate exchange**- It was a voluntary, legally binding greenhouse gas reduction and trading system operated from 2003 to 2010, it was created for emission sources and offset projects in North America and Brazil • **Carbon farming initiative in Australia**- It allows farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land, which can then be sold to offset emissions. • **Kenya's agricultural carbon project**-Supported by the World Bank, this project aims to sequester carbon through sustainable agricultural land management practices in Western Kenya, providing carbon revenue streams to smallholder farmers. • **'4 per 1000' initiative**- It is launched during the COP21 climate talks in 2015, this initiative aims to increase carbon storage in agricultural soils by 0.4% each year to help mitigate climate change and enhance food security.

What are the challenges of carbon farming?

- **Geographical variability**- The *Indo-Gangetic plains* and the *Deccan Plateau* are well-suited for carbon farming, while the *Himalayan region* and coastal areas face challenges due to terrain and salinization.
- **Water scarcity**- Carbon farming can be challenging in hot and dry areas where water availability is limited.
- **Limitations of cover cropping**- Practices like cover cropping may not be viable due to increased water demand, hindering plant growth and carbon sequestration.
- **Financial barriers**-The adoption of carbon farming practices may require financial assistance for farmers, especially in developing countries where small-scale farmers lack resources.
- **Market access**- Lack of market infrastructure, certification standards, or buyers willing to pay a premium for carbon-neutral products can limit the economic viability of carbon farming.
- **Lack of awareness**- Limited awareness, inadequate policies, and technological barriers can hinder adoption efforts.

What are the opportunities for India?

- **Climate resilience**- As climate change intensifies, climate-resilient agricultural practices like carbon farming can benefit from adaptation strategies in India.
- **Economic benefits**- Agro-ecological practices in India have the potential to generate significant economic benefits, with estimates suggesting billions of dollars in value from adopting sustainable agricultural practices.
- **Carbon credit system**- It can incentivize farmers in India by providing additional income through environmental services, these systems can bridge the gap between feasible emissions reductions and climate stabilization while enhancing food security.
- **Technology adoption**- Advancements in agricultural technology, including precision farming, remote sensing, and data analytics, can support the adoption and monitoring of carbon farming practices in India
- **Multi-stakeholder approach**- Collaboration between government agencies, research

institutions, civil society organizations, and the private sector is essential to promote carbon farming in India.

What lies ahead?

- India needs to address challenges such as limited awareness, inadequate policy suppor, technological barriers and creating an enabling adoption environment.
- Despite these challenges, promoting carbon farming aligns with India's interests in mitigating climate change, improving soil health, enhancing biodiversity and creating economic opportunities for farmers.

Reference

[The Hindu- What is carbon farming?]

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