



Carbon Trading in the Agriculture Sector

This editorial is based on “[How prepared is the agriculture sector in carbon trading?](#)” which was published in The Hindu Business Line on 28/01/2023. It talks about the potential of the agricultural sector in carbon trading.

For Prelims: Greenhouse gas, Nationally Determined Contribution, UNFCCC, Energy Conservation (Amendment) Bill, 2022, Non-fossil fuel, Net zero emission

For Mains: Potential of the agricultural sector in carbon trading, Agricultural Resources, Government Policies & Interventions

The agriculture sector plays a significant role in carbon trading because it has the potential to both emit and [sequester carbon](#) (**the process of storing carbon in vegetation and soil**). Agricultural activities such as tilling, fertilizer use, and livestock production can release [greenhouse gas](#) into the atmosphere. On the other hand, practices such as [agroforestry](#), conservation tillage, and soil carbon sequestration can remove carbon from the atmosphere and store it in the soil.

India updated its [Nationally Determined Contribution \(NDCs\)](#) to the [United Nations Framework Convention on Climate Change \(UNFCCC\)](#) in August 2022. The updated NDC includes **50% cumulative electric power installed from non-fossil fuel-based energy sources** and an **additional carbon sink of 2.5-3 billion tonnes** of CO₂ equivalent through forest and tree cover by 2030.

The updated NDC target also aims to reduce the emissions intensity of its [Gross Domestic Product \(GDP\)](#) by 45% from 2005 levels by the year 2030. It also talks about propagating a healthy and sustainable way of living, including (through) a mass movement for [LiFE - 'Lifestyle for Environment'](#) as a key to combating climate change.

The [Energy Conservation \(Amendment\) Bill, 2022](#) was passed by Parliament which **mandates the exploration and use of non-fossil fuel energy sources and the creation of a national carbon market**. The Bill is **also futuristic in achieving the target of net zero emission by 2070**.

What is Carbon Trading?

- Carbon trading in the **agricultural sector refers to the buying and selling of carbon credits** that are generated by practices that reduce greenhouse gas emissions or increase carbon sequestration on farms and other agricultural lands.
 - These practices include things like conservation tillage, agroforestry, and other sustainable land management techniques.
- The concept of carbon trading in the **agricultural sector is seen as a way to provide financial incentives for farmers** to adopt environmentally friendly practices, which can help to mitigate the effects of climate change.

What Opportunities Carbon Trading in the Agricultural Sector Presents?

- **Additional Revenue:**
 - Participating in carbon offset projects can **provide farmers with additional revenue through the sale of carbon credits.**
- **Climate Change Mitigation:**
 - Adopting carbon abatement farming practices can **help to sequester carbon in the soil, which can contribute to the reduction of greenhouse gas emissions** and help to mitigate the effects of climate change.
- **Soil Health Improvement:**
 - Many carbon abatement farming practices, such as conservation tillage and agroforestry, **can improve soil health, which can result in increased crop yields and improved water retention.**
- **Biodiversity Conservation:**
 - Some carbon abatement farming practices, such as agroforestry, can also **help to promote biodiversity and support the survival of wild species.**
- **Sustainable Land Use:**
 - Carbon offset projects can **provide an incentive for farmers to adopt sustainable land-use practices**, which can help to conserve natural resources and reduce environmental impacts.
- **Rural Development:**
 - Carbon trading in the agricultural sector can **also promote rural development, by creating jobs and income-generating opportunities** in rural areas, and by supporting the development of small and medium-sized enterprises in the sector.

What are the Challenges of Trading Carbon Sequestered by Agriculture?

- **Difficulty of Accurately Measuring and Verifying Carbon Sequestration:**
 - This is due to the complex nature of the carbon cycle in soils and the difficulty of distinguishing the effects of specific farming practices from other factors such as weather and soil type.
- **Issue of Revenue:**
 - As a result of the adoption of carbon abatement practices, the expected additional revenue and the impact on crop yield must also be considered.
 - A farmer will adopt a carbon abatement practice if **he expects that revenue from the sale of carbon credits would compensate for the loss in crop yield, if any, due to its adoption.**
- **Lack of Reliable Data:**
 - There is a **lack of accurate and consistent data on carbon sequestration** by agricultural practices, making it difficult to quantify and trade carbon credits.
- **Complex Regulations:**
 - The **regulatory framework for carbon trading in India is complex and not yet fully developed**, making it difficult for farmers and other stakeholders to participate in carbon markets.
- **High Transaction Costs:**
 - The **costs associated with measuring, verifying, and trading carbon credits can be high**, making it difficult for small farmers and other stakeholders to participate in carbon markets.
- **Limited Demand:**
 - There is **currently limited demand for carbon credits from the agriculture sector**, making it difficult for farmers and other stakeholders to find buyers for their credits.
- **Lack of Awareness:**
 - Many farmers and other stakeholders in India **lack awareness of the opportunities and benefits of carbon trading**, and how to participate in carbon markets.

What should be the Way Forward?

- **Evolving a Transparent Process of Quantification and Verification:**

- The first step towards **creating a market for sequestered carbon is to evolve a transparent process of quantification and verification** of additional carbon generated by different farm practices.
- It is possible to **assess the quantum of carbon sequestered using [artificial intelligence](#) and remote sensing.**
- **Facilitating Participation in Carbon Trading:**
 - In the voluntary carbon market, **selling carbon credits is a tedious process for individual farmers.**
 - Nonetheless, their participation in carbon trading **can be facilitated by collectives such as [Farmer Producer Organization \(FPOs\)](#), and cooperatives that can organise farmers to adopt carbon abatement practices** and sell the accrued carbon credits on their behalf.
 - A few agro-tech companies, for example, 'Boomitra' and 'Nurture. Farm', organise farmers through intermediaries to facilitate their participation in voluntary carbon markets.
- **Creating Awareness among Farming Communities:**
 - There is a **need to create awareness among farming communities on the benefits of the adoption of improved agricultural practices** and participation in carbon markets.

Drishti Mains Question

How can carbon trading be effectively implemented in the agriculture sector in order to mitigate greenhouse gas emissions and promote sustainable farming practices?

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q1. The concept of carbon credit originated from which one of the following? (2009)

- (a)** Earth Summit, Rio de Janeiro
- (b)** Kyoto Protocol
- (c)** Montreal Protocol
- (d)** G-8 Summit, Heiligendamm

Ans: (b)

Exp:

- Adopted in 1997, the Kyoto Protocol came into force in 2005. It is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits parties to reduce greenhouse gas emissions, based on the scientific consensus.
 - Emissions trading, as set out in Article 17 of the Kyoto Protocol, allows countries that have emission units to spare – emissions permitted to them, but not “used” – to sell this excess capacity to countries that are over their targets.
 - Carbon Credit is a unit of measure, the credit given to someone or an entity/company or country, if they reduce their GHG emissions (CO₂ equivalents) by 1 unit. This is provided through Clean Development Mechanism (CDM) under the Kyoto Protocol, which facilitates a “carbon market”.
- Rio de Janeiro Earth Summit, or Rio Summit, was a major United Nations conference, held in Rio de Janeiro in June 1992.
 - The summit concluded with an agreement on the Climate Change Convention, which in turn led to the Kyoto Protocol and the Paris Agreement.
 - Another agreement was to “not to carry out any activities on the lands of indigenous peoples that would cause environmental degradation or that would be culturally

inappropriate”.

- The documents developed in the summit are; the Rio Declaration on Environment and Development, Agenda 21, Forest Principles.
- Montreal Protocol is a protocol to the Vienna Convention for the Protection of the Ozone Layer. It is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances believed to be responsible for ozone depletion.
- The outcome of 33rd G8 Summit held in Heiligendamm was Heiligendamm Process. This process was to initiate a dialogue on relevant issues with the important emerging economies.
- Four Areas of Focus
 - Promoting and protecting innovation;
 - Strengthening the freedom of investment by means of an open investment climate, including strengthening the principles of corporate social responsibility;
 - Determining joint responsibilities for development, focusing specifically on Africa;
 - Joint access to know-how to improve energy efficiency and technology co-operation, with the aim of contributing to reducing CO₂ emissions.
 - **Therefore, option (b) is the correct answer**

Q2. Regarding “carbon credits”, which one of the following statements is not correct? (2011)

(a) The carbon credit system was ratified in conjunction with the Kyoto Protocol

(b) Carbon credits are awarded to countries or groups that have reduced greenhouse gases below their emission quota

(c) The goal of the carbon credit system is to limit the increase of carbon dioxide emission

(d) Carbon credits are traded at a price fixed from time to time by the United Nations Environment Programme.

Ans: (d)

Exp:

- Emissions trading, as set out in Article 17 of the Kyoto Protocol, allows countries that have carbon emission units to spare (i.e., the difference between total emission cap and emission done) – emissions permitted to them, but not “used” – to sell this excess capacity to countries that are over their targets.
- If a country emits less than its target amount of hydrocarbons, it can sell its surplus credits to countries that does not achieve their Kyoto level goals, through an Emission Reduction Purchase Agreement (ERPA).
- Certified Emission Reductions (CERs) are a type of emission units (or carbon credits) issued by the Executive Board of Clean Development Mechanism (CDM) for emission reductions achieved by CDM projects.
 - It is verified by a DOE (Designated Operational Entity) under the rules of the Kyoto Protocol.
 - The Sustainable practices and application of ecofriendly technologies produce carbon-credits that could be traded. Thus, it leads to reduction in GHGs emission as it creates a competitive and remunerative market. The United Nations’ Intergovernmental Panel on Climate Change (IPCC) developed the carbon credit regime as a “market-oriented mechanism”.
 - **Therefore, option (d) is the correct answer**

Mains

Q1. Should the pursuit of carbon credits and clean development mechanisms set up under UNFCCC be maintained even though there has been a massive slide in the value of a carbon credit? Discuss with respect to India’s energy needs for economic growth. **(2014)**

Q2. Discuss global warming and mention its effects on the global climate. Explain the control measures to bring down the level of greenhouse gases which cause global warming, in the light of the Kyoto Protocol,

1997. **(2022)**

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