

Sun. Agri.: e- Newsletter, (2023) 3(12), 10-14

Article ID: 258

# **Carbon Trading in Agriculture**

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Available online at http://sunshineagriculture.vitalbiotech.org/

#### Article History

Received: 17. 12.2023 Revised: 22. 12.2023 Accepted: 26. 12.2023

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### INTRODUCTION

The agriculture sector has a substantial impact on carbon trading due to its capacity to both release and capture carbon (the process of storing carbon in plants and soil). Agricultural practices such as ploughing, application of fertilisers, and raising livestock have the potential to emit greenhouse gases into the environment. However, certain practices such as agroforestry, conservation tillage, and soil carbon sequestration have the ability to extract carbon dioxide from the atmosphere and store it inside the soil.In August 2022, India revised its Nationally Determined Contribution (NDCs) to the United Nations Framework Convention on Climate Change (UNFCCC). The revised Nationally Determined Contribution (NDC) sets a target of achieving 50% of the total installed electric power capacity from non-fossil fuel sources. Additionally, it aims to establish a carbon sink by increasing forest and tree cover, resulting in a reduction of 2.5-3 billion tonnes of CO2 equivalent emissions by 2030. The revised NDC target also seeks to decrease the emissions intensity of its Gross Domestic Product (GDP) by 45% compared to 2005 levels by 2030. The text also discusses the promotion of a wholesome and enduring lifestyle, which involves a campaign for LiFE - 'Lifestyle for widespread Environment' as a crucial measure to address climate change. Parliament has enacted the Energy Conservation (Amendment) Bill, 2022, which requires the investigation and utilisation of energy sources that are not derived from fossil fuels, as well as the establishment of a nationwide carbon market. The Bill also demonstrates a forwardthinking approach by aiming to achieve the goal of net zero emissions by 2070.



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Carbon credits in agriculture pertain to a mechanism wherein farmers and agricultural enterprises can get credits for diminishing or compensating for the release of greenhouse gas emissions resulting from their activities. Subsequently, these credits can be exchanged or bartered on the carbon market, offering a monetary motivation for the adoption of sustainable farming methods and responsible environmental management. Agriculture plays substantial role in the emission of а greenhouse gases, mainly due to practices like livestock farming, fertiliser application, and the clearing of forests for agricultural purposes. Nevertheless, specific agricultural methods, such as conservation tillage, cover cropping, and agroforestry, can aid in the absorption of carbon dioxide from the atmosphere. Through engagement in carbon credit programmes, farmers can adopt sustainable methodologies that effectively mitigate emissions and facilitate the process of carbon sequestration. Subsequently, they can measure and evaluate the amount of carbon emissions reduced and proceed to request carbon credits. These credits indicate a measured quantity of emissions of carbon dioxide equivalent that have been eliminated or prevented. Individuals, organisations, or governments seeking to compensate for their own emissions can acquire carbon credits. This establishes a market for carbon trading,

wherein the worth of credits is decided by the interplay of supply and demand. The sale of carbon credits can produce supplementary money for farmers, thereby motivating them to adopt sustainable practices. Carbon credits in agriculture are crucial for tackling climate change as they provide incentives for reducing emissions and boosting the use of carbon sequestration technologies. They offer a means for farmers to contribute to global climate objectives while also gaining financial advantages from their sustainable practices. Moreover, these programmes foster the adoption of cutting-edge farming methods that advance the long-term ecological sustainability in the agricultural industry.

### Meaning of Carbon Trading

Carbon trading in the agricultural sector involves the exchange of carbon credits that are produced through methods aimed at reducing greenhouse gas emissions or enhancing carbon sequestration on farms and other agricultural properties. These practices encompass methods such as conservation tillage, agroforestry, and other sustainable land management techniques.

Carbon trading in the agricultural sector is regarded as a means to offer monetary rewards to farmers for embracing eco-friendly methods, hence aiding in the reduction of climate change impacts.





# Opportunities Carbon trading in the agricultural sector

Engaging in carbon offset initiatives might offer farmers an opportunity to generate supplementary income by trading carbon credits.

# Efforts to reduce the impact of climate change:

Implementing carbon abatement farming techniques can facilitate the sequestration of carbon in the soil, so aiding in the reduction of greenhouse gas emissions and mitigating the impacts of climate change.

### **Enhancing Soil Health:**

Several carbon abatement farming techniques, such as conservation tillage and agroforestry, can enhance soil health, leading to higher crop yields and better water retention.

### **Preservation of Biodiversity:**

Agroforestry, among other carbon abatement agricultural strategies, can contribute to the conservation of biodiversity and the preservation of wild species.

#### **Sustainable Land Use:**

Carbon offset initiatives offer a motivating factor for farmers to embrace sustainable landuse methods, so aiding in the preservation of natural resources and mitigation of environmental effects.

# Agricultural and economic development in rural areas:

Carbon trading in the agricultural sector can facilitate rural development by fostering employment and income-generating prospects in rural areas. Additionally, it can bolster the growth of small and medium-sized firms in the sector.



Challenges of Trading Carbon Sequestered by Agriculture

# **1.** 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.

### 2. Revenue Concern:

When implementing carbon reduction measures, it is important to take into account the anticipated increase in revenue and its effect on crop yield. A farmer is ready to adopt a carbon reduction practice if they anticipate that the income generated from the sale of carbon credits will cover any potential decrease in crop yield resulting from its implementation.

### 3. Insufficient Data Reliability:

The absence of dependable and uniform data regarding carbon sequestration through agricultural techniques poses challenges in accurately measuring and exchanging carbon credits.

### 4. Complex Regulations:

The regulatory structure governing carbon trading in India is intricate and still in the process of being completely established, posing challenges for farmers and other stakeholders who wish to engage in carbon markets.

### 5. Excessive Transaction Costs:

The expenses linked to the process of quantifying, validating, and exchanging carbon credits can be exorbitant, posing challenges for small-scale farmers and other individuals involved in carbon markets to engage in such activities.

### 6. Scarcity of Demand:

At present, there is a scarcity of demand for carbon credits originating from the agriculture sector, posing challenges for farmers and other stakeholders in locating purchasers for their credits.

### 7. Absence of Awareness:

A significant number of farmers and other individuals involved in the agricultural sector in India possess limited knowledge on the potential advantages and prospects associated with carbon trading, as well as the necessary steps to engage in carbon markets.

Carbon credits offer numerous benefits in the agricultural industry, including the following:



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- Agriculture has the potential to generate carbon credits by absorbing and storing carbon dioxide from the environment through soil, as well as by reducing carbon dioxide emissions during various agricultural activities such as ploughing stubble management. and Various agricultural techniques, such as soil tilling, chemical fertiliser usage, and stubble burning, contribute to the release of carbon dioxide.
- Agriculture is the primary contributor to greenhouse gas emissions in the whole food system. Agriculture is a notable contributor to emissions, but it may also serve as a substantial reservoir to store carbon, aiding in the reduction, minimization, or capture of carbon dioxide emissions.
- Improving the soil's capacity to sequester carbon could enhance fertility, boost crop vields, increase farmer income, promote water conservation. and ultimately strengthen the resilience of agriculture. Rather than engaging in the practice of planting saplings in flooded fields, rice cultivation can be carried out by directly sowing seeds. This approach effectively minimises water consumption and mitigates the release of methane, which is generated by bacteria in flooded fields. Additionally, it enhances soil fertility.
- It is advisable to promote comparable methods to reduce emissions and provide farmers with carbon credits. Furthermore, farmers are incentivized to engage in these activities and improve soil carbon levels by having the opportunity to trade these credits on the market for extra income.
- Enhancing the soil's health and carbon sequestration potential can be achieved by promoting techniques such as zero-till agriculture, agroforestry, improved water

management, crop diversification, and decreased reliance on chemical fertilisers. Estimates suggest that soil carbon sequestration has the capacity to yearly absorb around 2.6 gigatons of emissions, making it a cost-effective approach to mitigating climate change.

## Way forward

Developing a Clear Process of Measurement and Confirmation: The initial action to establish a market for stored carbon is developing a transparent process for accurately measuring and confirming the additional carbon produced through various agricultural practices. Quantifying the amount of carbon sequestered can be achieved through the utilization of artificial intelligence and remote sensing techniques. Enabling Engagement in Carbon Trading: In the realm of voluntary carbon trading, the act of selling carbon credits can be a laborious undertaking for individual farmers. However, collectives such as Farmer Producer Organisations (FPOs) and cooperatives can assist in enabling their involvement in carbon trading. These organisations can help farmers adopt carbon abatement methods and manage the sale of their accumulated carbon credits. Some agro-tech businesses, such as 'Boomitra' and 'Nurture.Farm', collaborate with intermediaries to mobilise farmers and enable their engagement in voluntary carbon markets. Spreading awareness farming communities: It among is necessary to raise knowledge among farming communities regarding the advantages of adopting enhanced agricultural techniques and engaging in carbon markets.