

CARBON FARMING: A CLIMATE CHANGE SOLUTION



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Carbon farming (also known as carbon sequestration) is an agricultural management approach that helps the land store more carbon and release less greenhouse gases into the atmosphere.

Agriculture and livestock are responsible for 18% of total country emissions. Agriculture is responsible for over 80% of total nitrous oxide emissions, owing to fertilizers both synthetic nitrogen and manure in soils and pastures. It also contributes about 45 percent of total methane emissions. Methane emissions from livestock production, including enteric fermentation and manure management, account for around 80% of agricultural methane emissions. Rice cultivation is the second most significant source of agricultural methane emissions, with the remainder coming from savanna fire and crop residues for agricultural uses. (According to World Economic Forum)

While agriculture contributes to climate change through greenhouse gas (GHG) emissions, shifting weather patterns is also negatively impacted. With frequent dry spells, heat waves, and variable rainfall, climate change jeopardizes India's agricultural prosperity. With a growing population and the need to increase food production, the task of fulfilling rising food demand while managing and lowering GHG emissions from agriculture will be difficult to strike a balance.

By 2070, India has pledged to achieve zero carbon emission. This refers to a balance between the amount of emissions produced and the amount of emissions removed from the atmosphere. By adopting a systems approach of "Climate Smart," the agriculture sector may assist India in attaining this goal.

By managing their grazing



fields, farmers can maintain and restore vegetation on their grazing pastures, including tree cover along waterways. This method supports the land in carbon storage and the removal of greenhouse gas emissions from the environment. Individuals, businesses, and non-governmental organizations concerned about climate change would compensate farmers if their soil carbon levels grew. It will help farmers increase

their income while also storing carbon in their land.

Carbon farming is successful when carbon benefits from better land management or conservation efforts outweigh carbon losses.

Method of Carbon Farming

Suitable interventions for promoting low carbon agriculture are, **Forest Management**

Healthy forests capture and store carbon dioxide emissions from other sources, making them a valuable source of GHG sequestration. Carbon offsets can be achieved through a variety of methods, including:

- Avoided deforestation,
- Permanent land conservation,
- Reforestation and replanting initiatives, and
- Better forest management.

Grasslands Conservation

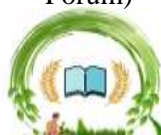
Native grasses and other vegetation, like forestry, serve as a natural source of greenhouse gas (GHG) absorption and sequestration. This kind of carbon offset focuses on preserving native plant life through long-term land conservation rather than converting grassland for commercial development or intensive agriculture.

Using Cover Crop

These crops are grown to cover the soil rather than to be collected. They are produced after the harvest of the main crop. They return more carbon to the ground and sustain soil microbes that play vital roles in carbon storage.

Mixed Farming

They were raising cattle and crops together in a climate-friendly way. Carbon in soil is replenished by rotating cows around pastures, which allows grasses to recover from grazing and allows animal dung and



the impact of their grazing to regenerate.

Reduction of soil Tillage

Tillage is normally used to loose and aerate the soil and to remove the initial weeds. However, tillage increases carbon mineralization leading to carbon dioxide emission from the soil. Reducing the soil disturbance is a valuable tool to protect soil organic matter;

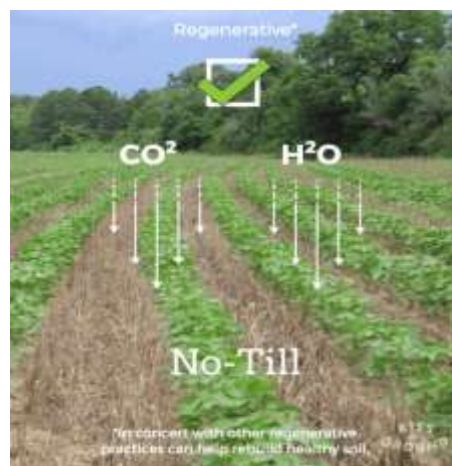
Introduction of superior livestock breeds to reduce numbers (especially unproductive cattle) and increase yield; use of livestock wastes to produce energy for cooking and heating through biogas technology can reduce methane emission and save electricity costs for the households.

Benefits of promoting low carbon technologies

The key advantages include cost savings in irrigation water, labour, and energy; reduced GHG emissions; increased water and fertilizer usage efficiency; moisture and heat stress tolerance; improved soil health; increased income and improve other planetary boundaries in peril such as freshwater, biodiversity, land use, and nitrogen use.

Constraints in promoting low carbon technologies

Significant constraints include requires participation at a larger level (include sound policies), more challenging for the farmer in hot and dry areas, high initial cost, infrastructure for installation and maintenance, knowledge intensiveness and technical

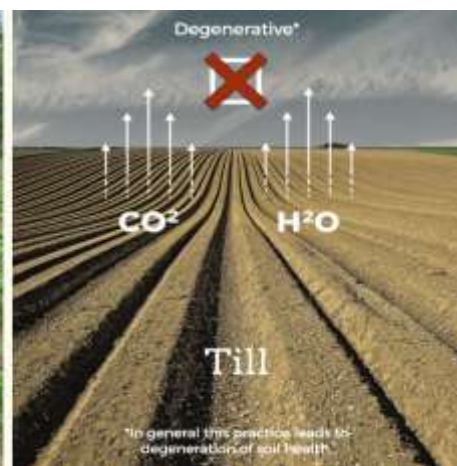


soundness, high production cost, risks in the rainfed regions, weed problem, yield loss, inadequate market facility, lack of awareness and limited post-harvest facilities. It may be challenging to establish baselines and measure carbon storage in agriculture. It is a complex effort to prepare an accredited carbon budget (carbon emissions and farming) for each farm.

Some programmes (e.g., agroforestry) have a long gestation time and are subject to uncertainty. Furthermore, getting to the stage of Carbon trading entails a significant transaction cost. To make it economical, a considerable amount of C mitigation must be created, which necessitates the widespread adoption of these technologies. Because the average size of a farmer's landholding in India is tiny, many farmers would need to implement these technologies to benefit from C trade.

Required interventions for promoting low C technologies

The interventions required to overcome the constraints are the creation of irrigation facility, provision of incentives for saving of



water, carbon credits for mitigation, subsidy and other incentives for the installation of resource conserving infrastructure, training for skill development, public awareness generation, development of low-cost, environment-friendly herbicides, accurate weather forecasting, development of post-arvest facilities and refining of technologies for making them simple, cheap and effective.

Cooperatives, self-help groups (SHGs), and even huge commercial enterprises could work together to overcome the problem of small farm size.

The introduction of 'carbon credits' also known as carbon allowances, which function as emission permission slips. When a corporation purchase a carbon credit from the government they given authorization to emit one tonne of CO₂. Carbon income flow vertically from firms to regulators with carbon credit, while companies with extra credit can sell them to other companies and the study of local carbon markets to adopt low-carbon technology.

