Biochar – Turning Farm Smoke into Black Gold

Prelims: *Current events of national and international importance | Agriculture*

Why in News?

Recently, Biochar has emerged as a carbon-negative solution to India's farm residue burning crisis.

- **Biochar** – It is a ***stable, carbon-rich form of charcoal*** (highly porous, carbon-rich, and decomposes slowly in soil).
- **Process –** Heating organic biomass (like crop residues, wood chips, or manure) in a low-to-no-oxygen environment (pyrolysis).
- **Function** – Locks carbon for long periods, contributing to *carbon sequestration.*

Carbon sequestration captures and stores CO_2 to fight climate change.

In soil, decaying plants lock carbon, keeping it underground and reducing greenhouse gases in atmosphere.

Key Features

- **Soil Health –** Improves water-holding capacity (10–25%), nutrient retention, and microbial activity.
- **Crop Productivity –** Field trials show 10–30% yield gains in nutrient-poor soils.

Maize stalk biochar and Coconut leaf stalk biochar enhanced soil fertility in Maharashtra and Kerala.

- **Climate Resilience –** Helps crops withstand droughts, heat waves, and erratic rainfall.
- **Circular Economy –** Converts farm residues and urban organic waste into a useful product, reducing methane emissions from landfills.

Carbon Credits Potential

- Biochar qualifies as a *persistent carbon dioxide removal technology.*
- **Carbon Credit Protocols –** VM0042 measures avoided emissions and long-term sequestration from biochar, with each certified tonne generating 2–2.8 t CO_2 equivalent credits for carbon markets.

Quick Facts

• **VM0042** – It is an internationally accepted *carbon accounting methodology* under the *Verified Carbon Standard (VCS).*
• It measures – *Emissions avoided and long-term carbon sequestration.*
• Together, it shows the climate benefit in carbon credits farmers can sell.

Reference

The Hindu | Biochar