

4. India's Carbon Credit Plan – Environment

The ₹20,000 crore carbon credit programme announced in Union Budget 2026 led to widespread debate, whether the allocation is meant for industrial decarbonisation (CCUS) or farmer-based carbon credit generation through sustainable agriculture

1.Introduction

1. India's Carbon Credit Programme, supported by a ₹20,000 crore outlay for Carbon Capture, Utilisation and Storage, reflects a strategic push toward industrial decarbonisation.
2. However, conceptual ambiguity between carbon markets and CCUS-based mitigation has raised concerns regarding scope, inclusivity, and policy coherence.

2.Carbon Credit Programme- Concept and Policy Context

1. A carbon credit represents a tradable permit equivalent to one tonne of carbon dioxide or its equivalent reduced or removed from the atmosphere.
2. Carbon markets incentivise emission reduction by assigning economic value to carbon mitigation efforts.
3. India's programme is currently aligned more closely with industrial emission reduction via CCUS rather than economy-wide carbon trading.
4. The initiative is part of India's broader climate commitments under the Paris Agreement and net-zero targets.

3.Carbon Capture, Utilisation and Storage (CCUS)- Mechanism and Scope

1. CCUS is a technological solution that captures CO₂ emissions at source points such as power plants and industrial facilities.
2. Captured CO₂ is transported and either reused in industrial processes or stored in geological formations.
3. The focus is on hard-to-abate sectors such as power, steel, cement, refineries, and chemicals.
4. CCUS is particularly relevant for sectors where direct electrification or renewable substitution is difficult.

4.Roadmap for CCUS in India

Short-Term Strategy

1. Deployment of existing and commercially viable carbon capture technologies across major industrial sectors.
2. Focus on scaling infrastructure such as transport and storage networks.

Medium-Term Strategy

1. Demonstration and validation of advanced technologies with improved efficiency and reduced costs.
2. Integration of utilisation pathways such as converting CO₂ into fuels or construction materials.

Long-Term Strategy

1. Investment in breakthrough innovations and next-generation technologies.
2. Emphasis on reducing costs and enhancing scalability of CCUS solutions.

5.Significance of the Programme

Industrial Decarbonisation

1. Helps reduce emissions from sectors that contribute significantly to India's carbon footprint.

2. Supports transition toward low-carbon industrial growth.

Energy Transition Support

1. Complements renewable energy expansion by addressing residual emissions.
2. Enables continued use of existing infrastructure with reduced environmental impact.

Economic Opportunities

1. Promotes development of new industries around carbon capture, storage, and utilisation.
2. Generates employment in green technologies and infrastructure.

6.Concerns and Limitations

Conceptual Ambiguity

1. The term carbon credit programme suggests a broader market-based mechanism, but implementation is largely CCUS-focused.
2. This creates confusion among stakeholders, particularly in agriculture and rural sectors.

Limited Sectoral Coverage

1. The programme primarily targets industrial emissions, excluding agriculture and land-use sectors.
2. This narrows the scope of carbon market participation.

Technological and Cost Challenges

1. CCUS technologies are capital-intensive and energy-intensive.
2. High costs and infrastructure requirements may limit scalability in the short term.

Risk of Carbon Lock-in

1. Continued reliance on fossil-fuel-based industries with CCUS may delay transition to cleaner alternatives.
2. It may create long-term dependency on mitigation rather than elimination of emissions.

7.Why Agriculture is Not Included

Nature of Emissions

1. Agricultural emissions are diffuse and arise from multiple small sources such as farms and livestock.
2. Emissions are primarily methane and nitrous oxide, not easily captured using CCUS technologies.

Biological Processes

1. Emissions are driven by natural biological cycles, making technological capture difficult.
2. Measurement and verification of emission reductions are complex.

Alternative Approach- Carbon Dioxide Removal (CDR)

1. Agriculture is better suited for carbon removal strategies such as soil carbon sequestration and agroforestry.
2. Practices like biochar and regenerative agriculture enhance carbon storage in ecosystems.
3. These approaches contribute to negative emissions rather than point-source emission reduction.

8.Need for Integrating Agriculture into Carbon Markets

1. Agriculture holds significant potential for carbon sequestration and climate mitigation.
2. Inclusion of farmers can promote inclusive growth and additional income generation.
3. Developing measurement, reporting, and verification systems can enable participation in carbon markets.
4. Linking agriculture with voluntary carbon markets can enhance rural sustainability.

9.Way Forward

Clear Policy Demarcation

Separate frameworks should be developed for CCUS-based industrial mitigation and agriculture-based carbon sequestration.

Avoiding conceptual overlap will improve policy clarity and stakeholder engagement.

Promoting Carbon Farming

1. Financial incentives should be provided for practices such as agroforestry, conservation agriculture, and soil management.
2. Capacity building and awareness programmes are essential for farmer participation.

Strengthening Carbon Market Infrastructure

1. Robust systems for measurement, reporting, and verification must be established.
2. Transparent carbon pricing mechanisms can improve market credibility.

Encouraging Innovation and Cost Reduction

1. Public-private partnerships can accelerate development of cost-effective CCUS technologies.
2. Investment in research and development can enhance efficiency and scalability.

Holistic Climate Strategy

1. Integration of mitigation, adaptation, and removal strategies is necessary for achieving net-zero targets.
2. Multi-sectoral coordination can ensure balanced and sustainable climate action.

Conclusion

1. India's Carbon Credit Programme, anchored in CCUS, marks a significant step toward industrial decarbonisation.
2. However, its limited scope and conceptual ambiguity highlight the need for a broader, inclusive carbon market framework.
3. Integrating agriculture, strengthening governance, and promoting innovation are essential to ensure an equitable and effective climate transition.

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