

5.Land Gap Report 2025

Recently, The Land Gap 2025 Report Released at Cop30 Warned That Global Climate Pledges Are Increasingly Relying on Land-Based Carbon Removal (Lbcr)

The Land Gap 2025 Report Evaluates Whether Global Net-Zero Strategies Are Compatible with Actual Land Availability, Ecological Limits, And Social Justice Requirements. It Highlights How Current Climate Pledges Rely Disproportionately on Land-Intensive Carbon Removal Practices, Creating A Widening Gap Between Promised Carbon Removals and The Practical Capacity of Global Land Systems. The Report Warns That Many Countries' Mitigation Plans Overlook Scientific Constraints and Risk Causing Significant Ecological Damage and Human Rights Harms.

Publishing Institutions – Led by The University of Melbourne, The Report Brings Together a Global Network of Climate Scientists, Environmental Economists, Governance Experts, And Policy Analysts.

The Analysis Incorporates Contributions from Leading Research Institutions Across Africa, Latin America, Asia, Europe, And Oceania, Ensuring Diverse Representation of Land-Use Challenges. It Positions Itself as A Reference Document for Climate Negotiations, Especially for Cop-Level Dialogues on Land, Forests, Carbon Markets, And Nature-Based Solutions.

Significance Of the Report – Provides Evidence-Based Warnings Against Excessive Dependence on Land-Based Carbon Removal (Lbcr) For Meeting Global Net-Zero Targets. Supports Countries and Negotiators in Moving Toward Realistic, Integrity-Based Climate Mitigation Pathways. Highlights That Climate Commitments Must First Prioritise Emissions Reductions at Source—Especially in Energy, Transport, And Industry—Before Turning to Large-Scale Land Solutions. Exposes How Current Land-Use Assumptions Are Built on Overly Optimistic or Unrealistic Projections About Land Availability and Carbon Absorption Potential.

Key Findings of The Land Gap 2025 Report

Massive Land Requirement – Countries' Carbon Removal Pledges Would Require Over One Billion Hectares of Land—Larger Than the Entire Continent of Australia. Such Land Demand Would Compete Directly with Food Production, Biodiversity Conservation, And

Livelihood Needs, Creating Severe Sustainability Trade-Offs. Many National Climate Plans Assume That Large Areas of Degraded Land Are Readily Available, A Claim Disputed by Ecological and Social Evidence.

Overreliance On Unrealistic Lbcr Strategies – Governments Disproportionately Depend on Tree Plantations, Bioenergy Crops, And Soil Carbon Programs Rather Than Reducing Emissions in Polluting Sectors. This Overreliance Masks the Lack of Ambition in Industrial Decarbonisation, Especially in High-Income Countries. Many Lbcr Strategies Are Scientifically Uncertain, Prone to Reversal (E.G., Forest Fires), And Limited in Their Real Sequestration Potential.

Social And Ecological Harm – The Report Warns of Emerging Patterns Of “Green Colonialism”, Where Powerful Nations or Corporations Acquire Land in Developing Countries for Carbon Offsetting. Such Land Acquisitions Often Lack Free, Prior, And Informed Consent (Fpic) From Indigenous Peoples and Local Communities. Potential Impacts Include Displacement, Restricted Access to Traditional Lands, And Undermining of Local Food Security. Large-Scale Beccs or Monoculture Plantations Can Destroy Existing Ecosystems, Degrade Soils, And Reduce Water Availability.

Neglect Of Forest Conservation – Existing Forests, Especially Tropical Primary Forests, Are the Planet’s Most Effective Long-Term Carbon Sinks. Climate Plans Tend to Undervalue Forest Protection, Prioritizing New Plantations Instead of Stopping Deforestation. The Report Stresses That Conserving Standing Forests Delivers Immediate, Large-Scale, And Low-Cost Climate Benefits, Unlike Speculative Carbon Removal Technologies.

Economic Drivers of Forest Loss – Debt-Distressed Countries Often Exploit Forests to Generate Export Revenues, Creating A Debt-Deforestation Trap. Global Trade Systems Encourage the Export of Timber, Palm Oil, Beef, And Other Forest-Linked Commodities, Putting Immense Pressure on Remaining Forests.

Structural Economic Factors—Such as Limited Fiscal Space, High Borrowing Costs, And Dependence on Extractive Sectors—Further Worsen Forest Degradation. The Report Argues for Debt Relief, Climate Finance, And Trade Reforms to Align Economic Incentives with Forest Protection.

Land-Based Carbon Removal (LBCR)

Definition – LBCR Refers to Strategies Using Terrestrial Ecosystems—Forests, Soils, Grasslands, Peatlands, Agricultural Systems—To Capture and Store Atmospheric Co₂.

While Considered Essential for Long-Term Net-Zero Goals, Large-Scale Deployment Raises Concerns About Land Competition, Ecological Integrity, And Human Rights. Many LBCR Measures Require Sustained Maintenance, Monitoring, And Governance, Which Increases Costs and Uncertainty.

Methods Of LBCR

Reforestation & Afforestation

Reforestation – Re-Establishing Forests in Previously Forested Areas.

Afforestation – Planting Trees Where No Historical Forest Existed.

IPCC Estimates Mitigation Potential – 0.5–10.1 Gt Co₂ Per Year. Risks Include –

1. Conversion Of Farmlands into Plantations
2. Replacement Of Biodiverse Ecosystems with Monocultures (E.G., Eucalyptus)
3. Increased Fire Vulnerability
4. Social Disputes Over Land Rights

6.2 Soil Carbon Sequestration – Practices Involve No-Till Farming, Cover Crops, Compost, And Bio-Inputs. Benefits Agricultural Productivity and Water Retention. However, Soil Carbon Is Unstable—It Can Be Lost Quickly Due to Drought, Erosion, Or Changed Land Practices.

Beccs (Bioenergy with Carbon Capture and Storage) – Cultivation of Fast-Growing Energy Crops (E.G., Miscanthus/Silvergrass). Biomass Is Burned for Energy, And Co₂ Is Captured and Stored Underground.

Challenges –

1. Extremely Land-Intensive
2. High Water Consumption
3. Risks Of Land Grabbing
4. High Technological and Financial Barriers
5. Lifecycle Emissions May Negate Benefits

Geologic Carbon Sequestration – Co₂ Is Injected into Deep Geological Formations Like Saline Aquifers or Depleted Oil Fields. Requires Robust Monitoring to Avoid Leakage or Induced Seismicity. High Upfront Infrastructure Cost and Limited by Geographic Suitability.

Biochar – Produced by Pyrolysis of Biomass in Low Oxygen. When Added to Soil, It Improves Fertility, Water Retention, And Long-Term Carbon Stability. Low Risk of Reversal, But Scalability Depends on Sustainable Biomass Supply.

Enhanced Weathering – Spreading Finely Crushed Reactive Rock (E.G., Basalt) On Land to Accelerate Natural CO_2 Absorption. Promising But Faces Challenges –

1. High Energy for Mining and Grinding
2. Uncertain Long-Term Impacts on Soils
3. Limited Field-Scale Validation

Conclusion

The Land Gap 2025 Report Strongly Concludes That the World Must Avoid Overburdening Land Systems with Unrealistic Carbon Removal Expectations. LBCR Can Contribute to Climate Goals but Cannot Substitute for Rapid, Deep, And Immediate Emissions Reductions in Fossil-Fuel Sectors. Protecting And Restoring Existing Forests, Rethinking Economic Drivers of Land Loss, And Ensuring Social Justice in Climate Action Are Essential. The Report Calls for Climate Strategies That Are Ecologically Grounded, Equity-Focused, And Aligned with Planetary Boundaries.

Source – <https://www.downtoearth.org.in/forests/cop30-one-billion-hectares-needed-to-meet-climate-promises-shows-report>