Forest Carbon Sequestration Potential in Tropical Ecosystems

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Abstract

We quantify the carbon sequestration potential of tropical forests and examine the role of reforestation in climate mitigation strategies. Our analysis combines satellite data with ground measurements to estimate carbon storage capacity.

Introduction

Tropical forests play a crucial role in the global carbon cycle, storing approximately 25% of terrestrial carbon. Deforestation releases this stored carbon, contributing to atmospheric CO2 concentrations. Conversely, reforestation and afforestation can sequester significant amounts of carbon. We used remote sensing data from Landsat and MODIS satellites to map forest cover changes over two decades. Field measurements provided ground truth for biomass estimates. Our results show that protecting existing forests and restoring degraded lands could sequester 10-15 gigatons of CO2 annually, representing a major natural climate solution.