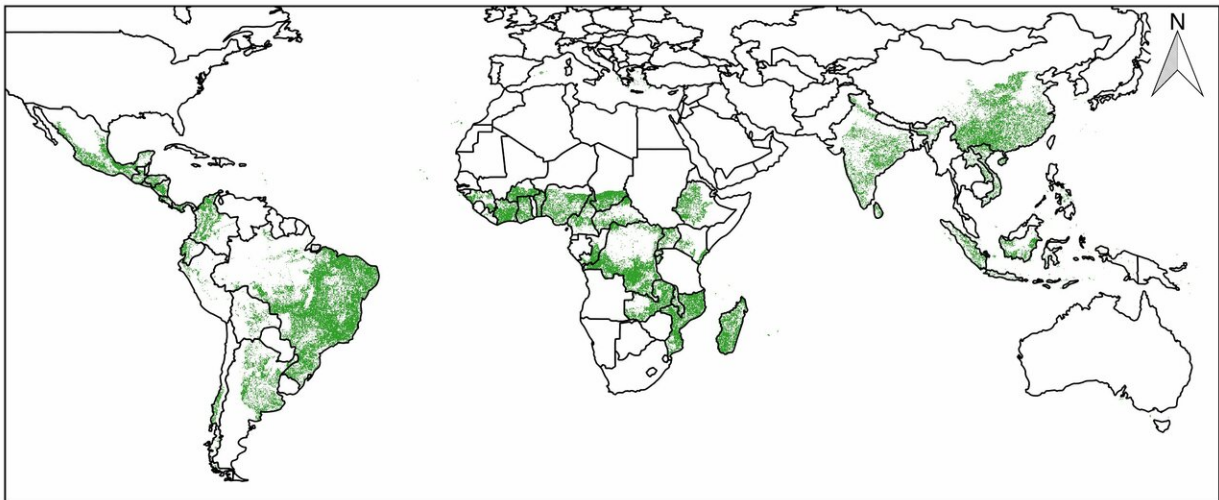


Restore natural forests to meet global climate goals

April 2 2019



Restoration opportunity map across 43 tropical and sub-tropical countries. Data source: Minnemeyer, S., et al. Bonn Challenge: A World of Opportunity (World Resource Institute, 2011). Credit: Data source: Minnemeyer, S., et al. Bonn Challenge: A World of Opportunity (World Resource Institute, 2011).

International plans to restore forests to combat global warming are flawed and will fall far short of meeting 1.5C climate targets, according to new research by UCL and University of Edinburgh scientists.

The study, published as a comment piece in this week's *Nature*, reveals that almost half (45%) of the vast areas that countries have pledged are

set to become plantations of commercial trees, a move which will seriously reduce expected [carbon uptake](#) and prevent agreements to curb climate change being met.

Lead author, Professor of Global Change Science, Simon Lewis (UCL Geography) said, "There is a scandal here. To most people forest restoration means bringing back natural forests, but policy makers are calling vast monocultures 'forest restoration'. And worse, the advertised climate benefits are absent."

"Plantations are much poorer at storing carbon than natural forests. To combat climate change, natural forest restoration is clearly the most effective approach. Well-managed forests can also help to alleviate poverty in low-income regions, as well as conserve biodiversity and support the UN's Sustainable Development Goals."

To meet 1.5C requires rapid emissions cuts and removing carbon from the atmosphere. The international community is striving to restore 350 million hectares of forest, an area slightly larger than the size of India, by 2030, to do just this.

New calculations based on 43 countries' restoration pledges show that only by allowing natural forests to return would sufficient carbon be captured for new forests to play their part in meeting global climate goals.

The 43 tropical and sub-[tropical countries](#)—where trees grow fast—have signed up to restoration commitments, many as part of the Bonn Challenge that aims to restore 350 million hectares of forest. Together, those countries, which include Brazil, India and China, have already committed to restore 292 million hectares of forest.



18-year-old naturally regenerating forest (exclusion of fire, some planting of native species) in Kibale National Park, Uganda. The forest supports elephants and many species of monkey after just 18 years. Credit: Credit, S. Lewis.

The study, which is the first in the world to compile and analyse country-level commitments for forest restoration, shows that land put aside for natural forests holds 40 times more carbon than plantations and six times more than agriculture that mixes trees and crops, known as agroforestry.

Using long-term carbon sequestration rates for natural forest, plantations and agroforestry, the researchers show that restoring natural forests over 350 million hectares of land removes 42 billion tonnes of carbon by 2100, whereas using current pledges for plantations (45%), natural forests (34%) and agroforestry (21%) applied to the whole area reduce

this to 16 billion tonnes of carbon by 2100, assuming that all new natural forests are protected. And if commercial monocultures were planted across 100% of the area just 1 billion tonnes of carbon is sequestered.

Countries differ vastly in their commitments. Vietnam represents the world's largest commitment of new natural forests, at 14.6 million hectares; Brazil has pledged 19 million hectares of new plantations; Nigeria has the most agroforestry, 15.7 million hectares.

Co-author Dr. Charlotte Wheeler (University of Edinburgh and formerly of UCL) said, "The reason plantations are so poor at storing carbon is that they are harvested every decade or so, meaning all the carbon stored in the trees goes back into the atmosphere, as the [plantation](#) waste and the wood products—mostly paper and chipboards—decompose.

"Instead, restoring all 350 million hectares back to natural forests can meet the role forests need to play under Inter-governmental Panel on Climate Change emissions pathways that keep [global warming](#) to 1.5C.

"Of course, new natural forests alone are not sufficient to meet our [climate](#) goals. Emissions from fossil fuels and deforestation must also stop. Other ways to remove carbon from the atmosphere are also needed. But, no scenario has been produced that keeps [climate change](#) below dangerous levels without the large-scale restoration of natural forests."

The scientists recommend that the definition of 'forest restoration' excludes monoculture plantations, and propose four ways to increase carbon capture from today's forest restoration schemes. Firstly, increase the proportion of land being regenerated to [natural forest](#); second, prioritise [restoration](#) in Amazonia, Borneo and the Congo Basin, which support very high biomass forest compared to drier regions; third, build on existing carbon stocks by targeting degraded forests for natural regeneration; and fourth, once natural [forest](#) is restored, protect it.

Simon Lewis, Charlotte Wheeler and colleagues. 'Regenerate natural forests to store [carbon](#),' will be published in *Nature* online on Tuesday 2 April 2019 and in print on Thursday 4 April 2019.

Provided by University College London

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