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Overestimation Of Forest Preservation Generates Millions In Carbon Credits

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The majority of carbon offset schemes are significantly overestimating the levels of deforestation they are preventing, according to a study published in Science.
This means that many of the “carbon credits” bought by companies to balance out emissions are not tied to real-world forest preservation as claimed.

An international team of scientists and economists led by the University of Cambridge and VU Amsterdam found that millions of carbon credits are based on crude calculations that inflate the conservation successes of voluntary REDD+ projects.

Consequently, many tonnes of greenhouse gas emissions considered “offset” by trees that would not otherwise exist have, in fact, only added to our planetary carbon debt, say researchers.

REDD+ schemes generate carbon credits by investing in the protection of sections of the world’s most important forests – from the Congo to the Amazon basin. These credits represent the carbon that will no longer be released through deforestation.

Organisations and individuals can then offset their own carbon footprint by purchasing credits equivalent to a given quantity of emissions.

Carbon credit markets have exploded in recent years. Over 150 million credits originated from voluntary REDD+ projects in 2021, with a value of US $1.3 billion. Some companies use carbon offsetting to claim progress towards “net zero” while doing little to reduce greenhouse gases, say researchers.

“These projects have already been used to offset almost three times more carbon than they have actually mitigated through forest preservation…”
Prof Andreas Kontoleon

The team behind the latest study argue that the booming trade in carbon credits may already be a type of “lemons market”: where buyers have no way of distinguishing quality, so some sellers flood the market with bad products, leading to a breakdown of trust and ultimately market collapse.

“Carbon credits provide major polluters with some semblance of climate credentials. Yet we can see that claims of saving vast swathes of forest from the chainsaw to balance emissions are overblown,” said study senior author Prof Andreas Kontoleon, from Cambridge’s Department of Land Economy.

“These carbon credits are essentially predicting whether someone will chop down a tree, and selling that prediction.”

Kontoleon points out that overestimations of forest preservation have allowed the number of carbon credits on the market to keep rising, which in turn supresses the prices.

“Potential buyers benefit from consistently low prices created by the flood of credits. It means that companies can tick their net zero box at the lowest possible cost,” he said.

REDD+ is a loose acronym for “Reducing emissions from deforestation and forest degradation in developing countries”. Currently, credits from voluntary “avoided deforestation” projects are issued based on predictions of tree loss that would have occurred without the REDD+ scheme.

Researchers say these calculations – which take historical deforestation averages or trends, sometimes from over a decade ago, across a wide region that usually includes the REDD+ site – are often far too simplistic.

The latest study looked in detail at 18 REDD+ projects in five tropical countries: Peru, Colombia, Cambodia, Tanzania and the Democratic Republic of Congo.

While a total of 26 REDD+ project sites were investigated, only 18 had sufficient “baseline” deforestation data available to allow for useful comparative analysis.

The research team took a “counterfactual” approach. They identified existing areas of forest within a given region that closely resemble each particular REDD+ project – from matching levels of forest cover and soil fertility to similar records of mining and deforestation.

“If you exaggerate or get it wrong, intentionally or not, you are selling hot air”
Prof Andreas Kontoleon

A satellite view of deforestation in the Amazon. Credit: ESA/NASA

“We used real-world comparison sites to show what each REDD+ forest project would most probably look like now, rather than relying on extrapolations of historical data that ignore a wide range of factors, from policy changes to market forces,” said lead author Dr Thales West, a Fellow of the Centre for Environment, Energy and Natural Resource Governance at Cambridge, now based at VU Amsterdam.

Of the 18 REDD+ projects, only one had underestimated its deforestation rates, and one had predicted deforestation levels similar to its comparison site. The other 16 projects all claimed far more deforestation would have taken place than their comparison sites suggested.

In fact, of the 89 million carbon credits expected to be generated by these 18 REDD+ sites in 2020, some 68% of them – over 60 million credits – would have come from projects that barely reduced deforestation, if at all, according to the study.

Even the remaining 32% of carbon credits originated from REDD+ projects that had not conserved forest to the levels claimed by the project developers.

The researchers produced carbon credit calculations that replaced deforestation levels as predicted by each REDD+ project with the levels of real-world forest cover from comparison sites.

They estimate that only 5.4 million carbon credits were linked to additional cuts in carbon emissions created by preserved trees – the entire basis on which credits are sold. This suggests that only 6% of the total carbon credits produced by all 18 REDD+ projects in 2020 are valid.

As of November 2021, at least 14.6 million carbon credits from the 18 REDD+ projects had been purchased around the world to offset greenhouse gas emissions.

“These projects have already been used to offset almost three times more carbon than they have actually mitigated through forest preservation,” said Kontoleon. “And that’s with over 47 million credits still available in the market.”

The researchers highlight four possible – and overlapping – reasons why carbon credit schemes might be overestimating their effectiveness so dramatically.

One is that use of historical trends is simply highly inaccurate. Moreover, projects may be located where conservation is most likely to succeed regardless. Thirdly, certification rules currently require fixed periods for projections, so adapting to changes in deforestation rates is difficult.

Lastly, the researchers also highlight clear risks that methods of predicting deforestation may be “opportunistically inflated” to maximise revenues from credit sales.

“There are perverse incentives to generate huge numbers of carbon credits, and at the moment the market is essentially unregulated. Watchdog agencies are being created, but many of those involved are also linked to carbon credit certification agencies – so they will be marking their own homework,” added Kontoleon.

“The industry needs to work on closing loopholes that might allow bad faith actors to exploit offset markets. It must develop far more sophisticated and transparent methods of quantifying the amount of preserved forest to become a trusted marketplace.”

University of Cambridge

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