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Carbon offsets—popular with airlines to make net zero claims—seriously flawed

By Patrick Greenfield | May 19, 2021

Image courtesy of Danilo Bueno/Pixabay

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The forest protection carbon offsetting market used by major airlines for claims of carbon-neutral flying faces a significant credibility problem, with experts warning the

Money from carbon offsets can provide vital financial support for projects seeking to protect and restore some of the most beautiful threatened ecosystems around the world. Given that nature-based solutions can make a significant contribution to the climate mitigation needed to stabilize global warming, a functioning finance channel will be important for climate change progress— particularly for developing countries.

But a joint investigation into the offsetting schemes used by some of the world's largest airlines carried out by *The Guardian* and Unearthed, Greenpeace's investigative arm, found that although many forest projects were doing valuable conservation work, the credits that they generated by preventing environmental destruction appear to be based on a flawed and much-criticized system, even though these credits were being used to back up claims of "carbon-neutral flying" and net-zero commitments.

We looked at 10 forest protection schemes that airlines were using before the pandemic which had been accredited by Verra, a US nonprofit which administers the world's leading carbon credit standard, VCS (Verified Carbon Standard). Projects estimate the emissions they have prevented by predicting how much deforestation and land clearing would have occurred without them. The reductions are then sold on as credits. We found their predictions were often inconsistent with previous levels of deforestation in the area and in some cases, the threat to the trees may have been overstated.

Beyond that, there are concerns about the inherent problem of looking into the future and predicting which trees would and would not have been felled, and of proving additionality—that the project itself made a difference to the outcome—which have dogged the offset system from its outset. Although there has been work to address this fundamental issue, we found that concerns remained.

The findings have been fiercely criticized by Verra, who maintain that the methods they endorse have contributed to the fight against climate change and deforestation, and transformed local economies for the better.

Thales West, a scientist and former project auditor, led a study on schemes in the Brazilian Amazon that found that projects routinely overstated their emissions reductions. He said that the methodologies "are not robust enough" which means "there is room for projects to generate credits that have no impact on the climate whatsoever."

Arild Angelsen, a professor of economics at Norwegian University of Life Sciences,

Degradation), said that although Verra methodologies for claiming credits were a serious attempt to measure emission reductions from reducing deforestation, they were not currently robust enough.

Britaldo Soares-Filho, a deforestation modelling expert and professor at the institute of geosciences at the Federal University of Minas Gerais in Brazil told *The Guardian* that under the current system, calculating genuine emission reductions relied on being able to accurately predict the future. "Models are not crystal balls. Models are a sign to help devise policy and evaluate policy choices."

Land use software that he designed, Dinamica EGO, is frequently used by projects to predict where deforestation would have taken place. Soares-Filho said, in his experience, projects have a tendency to inflate threats to the forest and current modelling approaches result in "phantom carbon credits."

Alexandra Morel, an ecosystem scientist at the University of Dundee, Scotland, who was involved in setting up one of the 10 projects in question, believes it was difficult to judge if the emission reductions claimed by projects were real.

"It's impossible to prove a counterfactual," she said. "Rather than just valuing what forests are actually there, which are actively providing a carbon sink or store right now, we have to surmise which forests would still be here versus which ones are the bonus forests that were spared from the theoretical axe."

Margaret Kim, the CEO of Gold Standard, another organization that certifies carbon offsets, told *The Guardian* and Unearthed that her organization did not certify Redd+ projects because she believed the way it was set up did not work. "A project can actually cherrypick proxy areas. So a reference region can be set up to be most convenient to a project to maximize its baseline deforestation rate."

Verra, which certifies the projects studied by this investigation, pointed out that many of the benefits provided by these projects were difficult to measure. "Verra channels finance, technology, and knowhow to forest-dependent rural communities who otherwise lack resources. These projects tackle deforestation in increasingly novel and creative ways." They create jobs by creating wardens to look out for illegal logging; they support local farmers wanting to move to more sustainable practices; they improve access to water and education. "In a nutshell, projects are working to transform local economies so that they no longer have to depend on cutting down the forest." Some of the projects pointed out that they were dealing with aggressive cattle ranchers and loggers, corrupt government officials, coca plantations and local

But Verra also believes strongly in its Redd+ program, and argued that the analysis by our investigation was "profoundly flawed." It pointed out that since our initial contact with it, it had begun the process of amending its standard with a comprehensive set of updates that it believes represents "our commitment to making sure the accounting for emission reductions from forest preservation efforts is as accurate as possible, consistently incorporates the latest scientific best practice, and supports government-led efforts to stop deforestation."

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Crystal Davis, the director of Global Forest Watch at the World Resources Institute, strongly defended the usefulness of conservation finance mechanisms and pointed out that "tropical forests cannot afford to lose Redd+ as a mechanism for conservation financing at scale." She did not think the analysis by McKenzie Intelligence Services (MIS), a London-based company that specializes in geospatial imagery analysis and intelligence, showed projects were inflating their projections, but agreed "that post-facto assessment of the integrity of baselines is really hard to do.

"That's a big problem. I don't think Redd+ will ever realize its full potential as a conservation financing mechanism if we can't create more public-facing transparency and accountability in the system." She added that she was encouraged to see major efforts under way to achieve this.

Origins. It's well over a decade since the world's governments came up with a plan to slow and even stop deforestation as part of international action on the climate crisis. The plan was simple: developing countries would, basically, be paid not to cut down trees. The idea, signed off in 2007, was called Redd+.

It was hoped that the emissions reductions would feed into a cap-and-trade system for the climate, a market-based method that had proved successful a couple of decades earlier at dealing with acid rain (and then the ozone layer) by setting limits on how much sulphur dioxide every company could emit. If you needed to emit more than your limit, you bought credits from a company that had managed to emit less. The benefits of emitting less and the cost of emitting more rapidly drove down emissions. The plan was to do the same thing for greenhouse gases on a global scale.

But 13 years later, intense disagreement over the global carbon market that would underpin Redd+ and other climate mitigation systems has meant it is the only part of the Paris agreement rulebook that governments are yet to agree upon. In the absence of a robust, internationally agreed system, small-scale unregulated forest protection projects have sprung up around the world, often known as "voluntary Redd+".

There is no official certification system, but the most commonly used is Verra. Companies such as airlines, ice cream companies, banks—anyone who emits carbon and wants to offset their own emissions—give the nongovernmental organizations money to carry on protecting the forest.

So far the market for carbon offsets has been small, at about $300 million in 2019. But during the last couple of years, a huge wave of corporate net zero strategies and carbon neutrality claims have changed the need for stringent carbon accounting for Redd+ credits. The former Bank of England governor Mark Carney is leading a taskforce to transform carbon offsetting into a multibillion-dollar annual market. The chancellor, Rishi Sunak, has announced his intention to make London a global trading hub for voluntary offsets.

If these projects are to play the role outlined for them in the decarbonization of the developed world, by providing offsets for major companies and helping to contribute to the net-zero journey, then it is vital that the methodologies they use in order to calculate the reduction in emissions are rigorous and accurate.

Logs floating their way to the mill. Image courtesy of
Lennart Heim/Unsplash

Currently, Verra has a number of requirements for projects that it will agree to certify
and there are several methodologies that can be used. Generally, each Redd+ project
must measure deforestation and land use changes in a reference region, a much
larger area that is judged representative of the scheme that often includes the
project. They must also document environmental threats from nearby areas, their
conservation activities, the ecological makeup of the area, and the likely effect of the
Redd+ project on the communities that live in and around it, in many cases by
projecting historical trends into the future.

The number of carbon credits generated by a project depends on the difference
between its prediction of deforestation and what actually happens. Verra says its
methodologies are conservative by design to ensure counterfactual predictions are
realistic. The claims are then checked by an approved third party auditor to see if
they have followed the methodology correctly.

The Guardian and Unearthed looked at 10 projects, which supply credits to six major

help of experts and commissioned satellite analysis, exactly how realistic their predictions were. Although this is not a comprehensive analysis of voluntary Redd+ projects, these projects make up 10 of the 79 that Verra oversees, so an analysis will give some helpful insight into the functioning of the larger sector. We looked at the tools they had used for their predictions, and at the outcomes to date.

How the investigation was done. The investigation found an inconsistent use of predictive methods and tools. Two of the projects had used Dinamica EGO to estimate where deforestation would take place given threats to the environment. Soares-Filho cautioned against its use for Redd+ projects, and said the modelling approach of calculating forward-looking baselines resulted in "phantom credits" because the software was not designed to accurately predict the future.

Two had modelled deforestation and land use change using a tool that allows them to assume a massive rise in the rate of deforestation compared with the historical rate.

One project had used a simple single variable model, which predicted a large increase in deforestation in the absence of the project. Another two had built their own models – one claiming the entire rainforest would be gone without them, another claiming that about a quarter would go. Another adopted a baseline from the national government. One said it would prevent large amounts of deforestation with sustainable nut farming, another with a mixture of planned logging and forestry protection.

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We looked at the previous deforestation rates in and around the projects, and compared them with the predicted rates. Here, we found that where we were able to compare, the projects had generally predicted deforestation rates that seemed inconsistent with previous rates.

One project forecast an annual rate that was triple that in the worst year before it started. One in a remote, inaccessible part of the jungle was basing its predictions on the rate of deforestation either side of a major road. Another was looking after an area which had been converted into a national park and where there had been no illegal deforestation for years. Despite this, it predicted a huge increase in deforestation if the project was not there.

One had very low rates of deforestation before the project started but forecast high annual rates without it, while another had adopted a generally conservative approach. It was impossible to assess the forecasts of five projects because of technical limitations and methodologies they had used.

Land in Indonesia being clear-cut for a large-scale palm oil plantation. Image courtesy of ADPartners under Creative Commons License.

Four schemes had made deforestation predictions about their project area and a surrounding reference region that we could easily examine. We asked MIS to assess tree cover loss in the reference areas of all four projects, excluding the project areas (for a number of reasons it was not appropriate or possible to examine all 10). If tree cover is lower in that area it could indicate that the original predictions were inaccurate and deforestation baselines were inflated.

However, as Verra, GFW, and some of the projects pointed out to us, it could also indicate that the projects had been much more successful than originally expected, and that the work to reduce deforestation within the projects had spilled over into the surrounding area, reducing deforestation across the region.

The MIS analysis did, indeed, find that deforestation in the reference regions was far lower than predicted; in two projects the actual rate of deforestation, according to the MIS figures, was around a third of the predicted rate. In another it was half, while in a third it was just one-fifth. But the difficulty in assessing the meaning of this information highlights a fundamental problem with the accounting system.

We spoke with all the projects about their challenges and benefits of their work. "[We

officials, coca plantations and local drug cartels, extreme poverty, tropical storms, forest fires, perverse land use policies, and now climate change," one project told us.

Several said they were protecting precious ecosystems with rare wildlife, and their activities helped support their survival. "We rely on the voluntary carbon market to pay forest communities for the environmental services they provide for the global community, which include protecting the forest, reducing carbon emissions," another said. "We use the best science available, and comply with agreed and third-party verified protocols to produce carbon credits that vouch for the environmental services that are being delivered."

The carbon credits were a vital source of finance for almost all the projects. One said they had filled the gap after western donor funding dried up. Another said the money from credits helped support communities that otherwise would not have an outside source of income. Some Redd+ projects were for-profit schemes and said criticisms of the system were ideological.

Unfortunately, no comprehensive scientific assessment has yet been published on how forest-based carbon offsetting projects affect deforestation. This year, researchers at the University of Cambridge are expected to publish a first-of-its-kind study assessing how well Redd+ projects stop and slow deforestation.

The 2020 study by West, which was published in the *Proceedings of the National Academies of Science*, assessed 12 Verra-approved Redd+ schemes in the Brazilian Amazon to analyze how claimed emissions reductions matched up with reality.

To do so, researchers compared deforestation trends in Redd+ projects with control groups with similar characteristics, finding the schemes had routinely overstated their emissions reductions. The study found that reductions in deforestation were almost all due to national-level policies such as the 2006 soy moratorium in the Amazon that caused spectacular drops in deforestation— not the projects.

Although the 12 projects claimed 24.8 million metric tons of emissions reductions using Verra methodologies, deforestation rates in 11 of them showed no difference with control groups in the study. For the one project that did, authors said 40 percent of the claimed emissions were overstated.

In a statement, Verra said it was concerned that *The Guardian* did not understand how its methodologies worked, or the VCS rules, the investigation was "fatally flawed" and had not produced fact-based journalism, ignoring its success at

investigation and described it as a "hit piece" because of Greenpeace's opposition to carbon credits, adding that many of the criticisms were outdated and did not reflect what was currently happening with Redd+ carbon credits. Finally, Verra said the journalism was dangerous as it threatened finance for preserving standing forests and was more akin to a political campaign.

Verra is making substantial changes to the way projects generate credits to comply with likely changes if disagreements over the Paris agreement rulebook covering nation-level Redd+ are resolved. Projects will be "nested" in national and regional systems and will derive credits from a nationally allocated baseline. The organization has developed a new risk-mapping tool to highlight areas most at risk of deforestation. Verra said credits generated using previous methodologies would not be retired.

In response to the findings of the investigation, airlines said they trusted the quality of Redd+ credits they used for climate commitments, which were often sourced through a third party.

EasyJet, which offsets fuel emissions on behalf of all customers for "carbon-neutral flying," said it was an interim measure while zero-emission technology was developed and the airline was confident the projects it supported were in effect preventing forest loss.

British Airways said it was committed to net zero emissions by 2050 and offsetting remained a key part of its near-term plan while alternatives to fossil fuels were developed.

Delta said Verra's methodologies were rigorous and science-based, also adding that it was investing in low-carbon technologies. Other airlines echoed these comments and said the use of offsets was an intermediary measure.