CARBON MARKET WATCH

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Exposing the methodological failures of REDD+ forestry projects

15/09/2023

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EXECUTIVE SUMMARY

This briefing is based on research carried out by the University of California (UC) Berkeley Carbon Trading Project, funded by Carbon Market Watch. It systematically assesses the effectiveness of the four most popular project-based methodologies by the standard body Verra to generate carbon credits from projects that protect forests (REDD+).

Five main factors influencing carbon credit quality are analysed:

1. **Baselines:** Identifying what would have happened in the absence of the project in order to be able to quantify the impact of the project
2. **Leakage:** Measuring how much of the deforestation avoided by a project shifts to another location instead of being fully avoided
3. **Forest carbon accounting:** Measuring the amount of carbon stored in the forest protected by a project
4. **Permanence:** Assessing the risk of, and guarding against, the future release of carbon in trees protected by the project
5. **Safeguards:** Preventing negative impacts on local communities, indigenous people, or the environment from the project

The research uncovered how Verra grants developers a large amount of flexibility when estimating emission reductions, both through selecting the most advantageous methodologies, and then selecting the most advantageous approaches within a given methodology. It also exposes how auditors (so-called "validation and verification bodies") are left with the freedom to limit their assessment to a "tick the box exercise", instead of focusing on whether or not projects truly deliver the impacts they claim. This results in overcrediting.

Baselines

Project baselines are significantly overestimated, the research found, leading to the creation of carbon credits that represent imaginary emission reductions. This is enabled by, among other factors, the freedom given to project developers to cherry pick methodological approaches, reference areas and risk estimation models. On average, when recreating a set of baselines that meet methodological requirements, the researchers found that the lowest baseline for a given project was 14 times lower than the highest baseline. This leaves an astonishing amount of leeway for project developers to pick the scenarios and parameters that will maximise the quantity of credits they can receive.

Leakage

Similarly, leakage is systematically underestimated by projects, which make use of flexibilities provided to them by the methodologies to downplay the risk of deforestation moving to areas outside of their project. While the deduction rate prescribed by the methodologies vary between 10 and 70%, supported by the research literature, the average leakage rate deducted by REDD+ projects in the study sample is 4.4%.

Carbon accounting

The creation of low-quality carbon credits is further fuelled by exaggerated estimates of the quantity of carbon stored within the trees that are protected by projects. Methodologies provide a lot of flexibility to developers to choose equations that maximise credit issuance. Overall, project developers' estimates of the carbon content of the forests they are protecting are 23%-30% higher than the mean of the researchers' estimates, implying a similar rate of over-crediting.

Permanence

The risk that the trees protected by REDD+ projects will die in the future is also drastically underestimated by projects, which again use methodological flexibility to misrepresent the real deforestation threat that forests will face in the future. The research finds that the risk of reversal due to natural phenomena (e.g., fires or pests) is underestimated by a factor of 10. In addition, nearly three-quarters of projects report no external risk (such as political or business risks), which is not plausible for projects implemented in countries where, among other things, political risk is relatively high.

Safeguards

Finally, the safeguards implemented by Verra are weak, do not protect communities from harm, and are not properly upheld by the validation and verification bodies (VVBs). The study highlights several cases where VVBs blatantly ignored negative effects and simply rubber stamped projects.

Root cause of failure

In light of recent exposés of projects massively overestimating their impact, the future of REDD+ is uncertain. This study demonstrates that the root cause of this phenomenon is the endemic failure of methodologies to guarantee accuracy, let alone conservativeness. REDD+ projects do not generate high quality carbon credits and should not be eligible to receive the Integrity Council for the Voluntary Carbon Markets' (ICVCM) quality label. Nor should REDD+ credits be traded or used by countries as part of efforts to reach their nationally determined contributions, such as through market mechanisms under Article 6 of the Paris Agreement.

Other financing avenues to protect tropical forests must be found. Understanding and accepting that REDD+ credits are not equivalent to emission reductions is the first step in fixing the problem. The second lies in identifying avenues to channel public and private finance to battle deforestation, for example through the implementation of tighter controls and financial levies on imported deforestation. Ultimately, addressing the real drivers of deforestation, such as the growth in the consumption of goods that cause deforestation, is a necessary condition to protecting the world's remaining forests. While REDD+ has been largely focused on changing the practices of often small and marginalised local actors, it is time to focus on the much larger economic and political interests that drive deforestation.

1. CARBON MARKETS AND FOREST CONSERVATION FINANCE

1.1 Setting the scene

Forests, and primary forests in particular, play a crucial role in regulating the world's climate and host the bulk of the planet's terrestrial animal and plant life. This makes the protection, conservation and restoration of forests essential to tackling both the climate and biodiversity crises. However, forest conservation is significantly underfunded. Climate finance pledges from developed countries have not been met[1] and private support has been largely conditioned on the creation of carbon credits that companies can use to green their corporate images and that many are using to deflect attention from their inadequate climate action.

This has resulted in a credibility and integrity crisis that threatens to worsen rather than resolve the finance gap facing forest conservation efforts. Governments are not imposing sufficiently strong measures to force companies to contribute to the fight against deforestation, in part as a result of the lobbying of those companies. In addition, there is little money being voluntarily contributed for forest protection by the private sector, and the lack of quality of carbon credits is rightly raising some questions within companies who do not want to spend their cash on projects that have no or little impact.

REDD+ has a long history of trying to channel finance to forest protection, with very limited and highly controversial results. It was created as a climate finance framework under the UN's Framework Convention on Climate Change (UNFCCC). Later, the name "REDD+" was adopted by voluntary carbon market standards - in particular the Voluntary Carbon Standard (VCS) - to create carbon credits out of specific forest conservation projects. It is important to note that the UN REDD+ system was never used as a system for the issuance of exchangeable carbon credits. It is fully distinct from the co-opting of the term by private initiatives.

[1] Oxfam: Roadmap confirms rich nations will meet $100 billion climate finance target later than promised: Oxfam reaction | Oxfam International

Demand for forestry carbon credits has been high in the unregulated carbon market in recent years. Verra, the world's largest carbon credit standard, has certified 97 REDD+ projects, generating 445 million credits (as of May 10th 2023[2]). For the most part, these REDD+ projects are located in the tropical regions of Latin America, Southeast Asia and Africa.

1.2 Focus on flawed methodologies

In light of this, this briefing focuses on providing concrete recommendations to improve the current state of REDD+ crediting. At the same time, it highlights the inherent flaws of using carbon credits to offset emissions from the combustion of fossil fuels, and supports a move away from compensation claims and towards "contribution" claims to finance REDD+ activities. It is based on an extensive research project carried out by the University of California (UC) Berkeley Carbon Trading Project. The researchers analysed the four main methodologies used to issue carbon credits from REDD+ projects under the VCS standard.

Verra is in the process of reviewing its rules on REDD+. This briefing provides insights into the critical failings of the system, the gaps that remain and inspiration for finding alternatives that do not repeat the mistakes of the past.

Fundamentally, this research highlights the inherent contradictions that lie in efforts to create assets (carbon credits) from forest conservation projects that are meant to compensate for emissions generated by the combustion of fossil fuels. Much needs to improve when it comes to impact quantification and ensuring the long-term protection of (primary) forests. However, methodologies and accounting rules can only go so far, and it is illusory to assume that storing carbon temporarily in forests can be used to permanently neutralise the effects of emissions in a way that can meaningfully tackle the climate crisis.

Quantifying the climate impact of a project involves a significant level of uncertainty. Factoring in this uncertainty to ensure sufficient conservativeness and satisfy the precautionary principle would lead to the issuance of much fewer credits than is currently the case, which would lead to a significant rise in the price of individual carbon credits. The low price that buyers are generally willing to pay for carbon credits would

[2] Voluntary Registry Offsets Database | Berkeley Carbon Trading Project | CEPP Projects | Center for Environmental Public Policy (CEPP) | Centers | Research and Impact | Goldman School of Public Policy | University of California, Berkeley

not raise enough capital to fund projects that issue a (comparatively) low volume of credits.

Even if the voluntary market were to accept a sufficiently high carbon price, there would still be a mismatch between the duration that any organisation can guarantee for carbon storage today, and the lifetime of CO2 in the atmosphere. No organisation can confidently ensure the conservation of a carbon sink for several centuries, let alone millennia, and offsetting emissions from the combustion of fossil fuels that had lain undisturbed for millions of years with highly unstable biological carbon sinks is both risky and scientifically unsound.

Because of this, **the changes needed in the forest finance sector go beyond a technical improvement of methodologies**. A fundamental shift away from the offsetting logic is required. Companies and other users of carbon credits need to clearly separate reporting of their contributions to forest conservation efforts from their own emission reduction efforts, rather than combining them all into a single “net” number that masks the true extent of their decarbonisation.

2. REDD+ MARKET ACTIVITY

The voluntary carbon market involves various players that participate in the buying and selling of carbon credits. These include suppliers or sellers that develop projects that generate carbon credits through emission reductions and removals, intermediaries that help connect buyers and sellers, and end users who choose to purchase carbon credits.

The extensive REDD+ methodology research we funded produced 19 detailed project case studies. Allied Offsets analysed the retirement (i.e. the cancellation) of credits for these 19 projects for Carbon Market Watch.

While this data is useful and telling, it requires an important caveat. At present, all disclosed retirement information (such as the beneficiary of a credit or the identity of the intermediary) is voluntarily disclosed by market participants. This means that the intermediaries and companies mentioned below are those who were transparent enough to disclose their identity in the public VCS registry. The consequence of this is that the picture provided in the analysis below will be by necessity a partial one.

For the sake of transparency and to enable independent parties to properly monitor the market, such disclosure must be made compulsory. All beneficiaries and intermediaries should be publicly listed in all registries. Registries that do not yet do so should publicly disclose the account holders and their credit holdings, as is already done by some, such as the Global Carbon Council (GCC) and the UK Woodland Carbon Code.

2.1 Secretive market

Carbon market intermediaries are companies, such as brokerages or online resellers, that facilitate the buying and selling of carbon credits. Intermediaries connect project developers who generate carbon credits with individuals or organisations seeking to purchase carbon credits. These activities can take a range of forms, from “simple” data platforms and exchanges, to more sophisticated consultancies that provide specific policy and strategic advice to buyers. Due to the complexity of the VCM, intermediaries can help buyers find the types of credits they are seeking, but they can also exploit the lack of knowledge of buyers and the lack of access or financial resources of sellers to profiteer.

Retirement data for the 19 REDD+ projects analysed by AlliedOffsets shows that the identity of intermediaries, who retire the credits on behalf of a client, was only disclosed for 1.3% of the credits used. This means that 98.7% of credits were either traded by anonymous intermediaries or without the involvement of intermediaries.

This is only the tip of the iceberg. Even in cases where the identity of the intermediary is disclosed, assessing the number of times credits changed hands and at what price, before they were used, is practically impossible. This means that it is not currently possible to know who is buying and selling credits, nor how much of the money flowing through the market actually finances climate action as opposed to staying in the pockets of intermediaries.

While some intermediaries are acting transparently, this cannot be said of the vast majority of companies in this space. In a separate analysis[3], we found that only 10% of intermediaries disclosed the fees they charge on carbon credit transactions. The average fee was 15%. This is likely a significant underestimation of the market average, and the near-total opacity over the identity of intermediaries and their margins raises serious questions about the voluntary carbon market's true contribution to climate action and carbon finance.

2.2 What are buyers claiming?

Given the lack of standardisation and guidance around the legitimate uses of carbon credits, REDD+ credit buyers make a diverse range of climate claims. Generally, the majority make some form of "compensation" claim, i.e. stating that the use of these credits compensates, counterbalances or "offsets" their own emissions. This is problematic, as discussed further down in this briefing. In this section, we provide an overview of the types of claims made by buyers.

In our sample of 19 REDD+ projects, 58% of retired credits were linked to a specific final beneficiary, while 42% were anonymous.

Below are examples of claims made by the five largest buyers of credits for the 19 REDD+ projects covered by our data. Together, these buyers used 65% of all credits for which the identity of the buyers was disclosed in our sample.

[3]Carbon Market Watch (2023): "Secretive intermediaries: Are carbon markets really financing climate action?"

All five companies have a prominent public profile and so their decision to make compensation claims is likely to mislead consumers.

CLAIMS MADE BY THE TOP FIVE COMPANIES USING REDD+ CREDITS

(according to publicly disclosed information)

SHELL (oil and gas) marketed fossil products as "carbon-neutral", "carbon compensated" and "reduced carbon footprint"[4]

ENI (oil and gas): used what it calls "natural climate solutions" as part of its decarbonisation strategy and claimed that the purchase of REDD+ credits "offsets"[5] (part of) its GHG emissions

GREEN CHOICE (energy) marketed so-called "forest-compensated gas"[6] to its customers which misleadingly suggested that "the expected (positive) CO2 impact of these forestry and nature projects is proportional to the CO2 footprint of the natural gas we supply"

DELTA (Airline): Claimed to be the "world's first carbon-neutral airline"[7]

***GUCCI**, the 4th largest buyer within our sample of publicly disclosed buyers, initially made a carbon neutrality claim, but now has retracted that claim (May 2023)[8] following criticism of the quality of the credits that they had purchased

Two out of these five companies - Shell and Delta Airlines - have so far been subject to legal or regulatory actions targeting their misleading climate claims; one of which has been lost (Shell) and one of which is still ongoing (Delta).

In addition, we have also identified numerous claims focused on purported future environmental benefits, in particular the announcement of "carbon neutrality" or "net zero" targets, usually by 2030 to 2050, which tend to depend on the use of carbon credits. For the 40 companies listed in our sample of retirement data, we found that 36

[4] Shell (website - consulted on August 1st, 2023): "*Shell's Carbon Neutral and Reduced Carbon Footprint Products*"
[5] Eni (website - consulted on August 1st, 2023): "Eni's support for Natural Climate Solutions"
[6] Green Choice (website - consulted on August 1st, 2023): "Forest Compensated Gas"
[7] Delta (website - consulted on August 1st, 2023): "New campaign shines light on Delta's carbon neutrality"
[8] Gucci (website - consulted on August, 1st August 2023): "Adverts claiming products are carbon neutral by using offsetting face UK ban"

made some sort of future net-zero commitment, which problematically fails to communicate the extent to which the company is truly addressing its own climate impact through rapid and significant emissions cuts. Instead, they too often cloak or mask climate inaction, as the vast majority of companies with net-zero targets are not on a trajectory that is compatible with limiting global warming to 1.5°C, as exposed in the Corporate Climate Responsibility Monitor[9] and other research.

To combat greenwashing and guarantee real climate action, companies need to move away from claiming that the offsetting with REDD+ credits is equivalent to reducing emissions inside their value chain. That is not the case, due to the numerous quantification and other issues covered in the next section of this briefing.

This being said, it is essential that companies still channel finance towards the conservation of (primary) forests. Measuring the impact of this financing, ensuring that the money reaches the mitigation activities, and preventing companies from misusing this to deceive the public about their own levels of climate ambition are some of the building blocks of a more sustainable approach. For example, companies can continue to invest in forest conservation activities, while claiming this as a contribution to climate action, rather than as a way of offsetting their own emissions.

[9] NewClimate Institute & Carbon Market Watch (2023): "2023 Corporate Climate Responsibility Monitor"

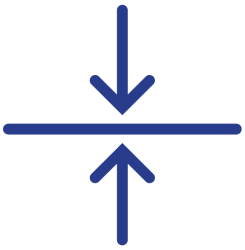
3. QUALITY OF REDD+ PROJECT METHODOLOGIES

The extensive research carried out by the UC Berkeley Carbon Trading Project funded by Carbon Market Watch investigated why so many REDD+ projects have been found in various media exposés and scientific papers to be of poor quality and of questionable climate benefit when there are such complex rules in place, managed by Verra through the Voluntary Carbon Standard.

The research focused on five dimensions of the quantification of climate benefits from REDD+ activities: baseline setting, leakage, forest carbon accounting, permanence, and safeguards. This is the first part of a two-part research project. It focuses on project-level REDD+, in particular the four most common methodologies for REDD+ under the VCS, while the second part will focus on jurisdictional-level REDD+.

The methodologies analysed by the research were **VM0006**, **VM0007**, **VM0009** and **VM0015**

The* executive summary *of the original research paper is available here. The full research paper is accessible here.



3.1 Baselines

3.1.1 Introduction

Baselines quantify the estimated amount of deforestation and degradation that the developer assumes would have happened without the project. Observed deforestation is then compared to the baseline level to measure how supposedly effective the project was. In VCS REDD+ methodologies, baseline scenarios are calculated using reference regions, i.e. areas of similar conditions and agents as those that are expected to materialise in the project area. Historical rates of deforestation in the reference region, and sometimes an estimation of where that deforestation is most likely to occur, are used to predict future deforestation in the project area.

For example, imagine historical data showing the average deforestation level in the reference area over a 10 year period has been 1% of the forest per year. Now, assume that the estimated carbon stock per hectare of forest in the project area is 300 tonnes and that the project area is 100,000 hectares. Baseline emissions would be calculated based on the assumption that the observed deforestation rate in the reference area will also materialise in the project area, and hence that a certain number of hectares of forests, each containing 300 tonnes of CO2e, will be lost (1% x 100,000 x 300 = 300,000 tonnes CO2/year). This value represents an expectation of the average emissions resulting from deforestation in the area without any project intervention. This means that the estimate of future deforestation is, in this simplified example, purely based on past deforestation and a default estimate of the carbon content in the forest. A project's influence is then quantified by comparing the actual emissions resulting from deforestation during the project implementation period to the baseline emissions. If the project manages to reduce deforestation and keep emissions below the baseline level of emissions, the difference between the two is the amount of carbon credits the project is allowed to issue (minus leakage, an uncertainty deduction, and the buffer pool contribution discussed below).

As the example indicates, arriving at these estimates is replete with guesswork, counterfactual assumptions and huge potential margins of error.

3.1.2 Key findings

- **OVER-CREDITING:** Findings from previous research found that baselines were so inflated that only 1 out of every 13 credits represents a real emissions reduction.[10]

- **FLEXIBILITY & GAMING:** The new analysis explains that the source of over-crediting is likely the very large degree of flexibility that project developers have in setting baselines.

    - The first source of flexibility is the choice of methodology. This new analysis recreated 7 baselines for each of the 4 analysed projects using the 4 methodologies and different options within them. On average, even when applying the available baseline models conservatively, results were different by >1400% for a given project. This means that the highest baseline calculated for a given project was 14 times higher than the lowest.

    - A second source of flexibility is that each methodology allows for substantial freedom when choosing reference regions

    - A third source of flexibility is the possibility for project developers to choose their preferred modelling approach to estimate the risk of deforestation by location.

    Project developers use these flexibilities to exaggerate baselines. For all projects, the official baselines were higher than all or most of the study's independent estimates. It is clear that the methodologies leave the door open for project developers to cherry pick, i.e. to choose the most favourable locations and models, instead of the most representative and accurate ones, to estimate their baselines.

- **STATIC PREVISIONS**: Since all methodologies forecast baselines at the start of the project, regional changes that occur over time are not considered, causing uncertainty.

[10] West, T.A.P., Wunder, S., Sills, E.O., Börner, J., Rifai, S.W., Neidermeier, A.N. and Kontoleon, A., 2023. Action needed to make carbon offsets from forest conservation work for climate change mitigation. *Science, 381*, 873–877. https://science.org/doi/10.1126/science.ade3535

3.1.2 Recommendations

- **EX-POST BASELINE SETTING:** To improve methods for estimating the carbon benefits from REDD+ projects, baselines should be estimated ex-post. Such methods observe how deforestation evolves in an area that resembles the project area, and compares this to deforestation in the project area. Great care should be taken to ensure that these "control areas" are representative of the project area.
- **TRANSPARENT ACCOUNTING:** All calculations, formulas and models used for baseline quantification should be made publicly available, including spreadsheets and risk maps where relevant, in a way that allows any outsider to recreate the baseline calculations independently.
- **INDEPENDENT ANALYSTS:** Baseline setting should be carried out by independent parties with no conflicts of interest. Independence includes, but is not limited to, having no direct financial ties to a project developer active in the region for which the map is being developed.
- **MINIMISE FLEXIBILITY:** Project developers should have minimal flexibility to cherry pick models (such as regression models) or make other choices that influence baseline determination.
- **FACTORING IN RISK:** Uncertainty in baseline quantification should be measured and transparently communicated. It should be taken into account when issuing credits. The level of conservativeness in impact quantification should be commensurate with the level of uncertainty.

3.2 Leakage

3.2.1. Introduction

Leakage refers to an unintended increase in greenhouse gas emissions outside of a project's boundary as a result of the project's implementation. For REDD+ projects leakage can happen when (some) deforestation, instead of being reduced, shifts to an unprotected location. Leakage falls in two categories: activity-shifting leakage and market leakage. Leakage can happen locally, within a country or region, or elsewhere in the world.

Activity-shifting leakage occurs when the actors that would have deforested in the project area without the REDD+ project shift their activity and deforestation to somewhere outside of the project boundaries. For example, if a stretch of Amazon rainforest is protected by a REDD+ project but illegal ranchers and loggers shift those activities to outside the designated area, this is activity-shifting leakage; all emissions linked to the displaced activity should be attributed to the project.

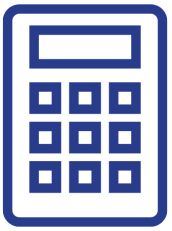
Market leakage refers to the displacement of deforestation through market forces. If a REDD+ project reduces the production of a traded good, the market can respond with an increase in production somewhere else, potentially far away from the project area. For example, if a forest conservation project is implemented in an area that would have been logged for timber, supply shortages of timber can lead to increased production elsewhere. The carbon footprint of this shift in production should be attributed to the project.

3.2.2 Key findings

- **BELOW MARKET RATES:** Projects apply extremely low market leakage rates resulting in very small deductions for market leakage. While the deduction rate prescribed by the methodologies vary between 10 and 70%, supported by the research literature, the average leakage rate deducted by REDD+ projects is 4.4%.
- **IGNORING THE MARKET:** One out of the four assessed VCS-REDD+ methodologies (VM0015) fails to include market leakage.
- **INTERNATIONAL BLINDSPOT:** All four assessed methodologies ignore international leakage, despite evidence that it occurs.
- **LOW AND ABNORMAL**: Each of the study's four core sample projects, chosen for reasons unrelated to leakage risk, applied low market and activity-shifting leakage rates and had abnormalities in their leakage rate justifications.

3.2.3 Recommendations

- **PREVENT CHERRY PICKING:** Identification of leakage belts (an area outside the project where a deforestation activity is expected to shift to) for assessing activity-shifting leakage should be more clearly regulated to avoid cherry picking of areas. Quantification of deforestation rates within those areas should be more robust by using independent assessments of deforestation rates before the project starts, as per the recommendations of the baselines chapter.
- **EXCLUDING EXCEPTIONS:** Exceptions that are used to justify exceedingly low leakage deductions - and sometimes no deduction at all - should be much more tightly controlled and should remain the exception rather than the norm.
- **GLOBAL PERSPECTIVE:** Measurement difficulty is not an appropriate excuse to simply assume that international leakage is 0. International leakage should be considered, conservatively estimated (noting the difficulty of this and the need to take into account uncertainty) and discounts that err on the side of caution should be applied.



3.3 Forest Carbon Accounting

3.3.1 Introduction

The number of credits a REDD+ project is eligible to generate depends heavily on the quantity of carbon stored in the forest that it is protecting. Emissions reductions are typically calculated as hectares of forest saved multiplied by the tonnes of carbon stored in one hectare.

Aboveground biomass (AGB), such as in tree trunks, and belowground biomass (BGB), in roots, are the primary carbon pools issued with carbon credits from forest ecosystems. AGB is quantified using allometric equations; mathematical formulas used to estimate forest carbon stocks based on measurements of tree attributes such as diameter and height. BGB, is commonly estimated using root-to-shoot ratios, where the amount of biomass underground is estimated as a percentage of biomass that is above ground.

3.3.2 Key findings

- **GROUND FOR DOUBT**: Overall, project estimates of the carbon content of the forests they are protecting are 23%-30% higher than the mean of the researchers' estimates, implying a similar total of over-crediting from forest carbon accounting methods. This is driven by overestimates in both aboveground and belowground carbon. On average, aboveground carbon is overestimated by 15%, and belowground carbon is overestimated by 61%.
- **FLEXIBLE FORMULAS:** REDD+ project developers utilising VCS methodologies are given significant flexibility to choose equations for calculating the amount of biomass and its carbon content. A set of permitted allometric equations resulted in a range of estimates of AGB that differed by 80% (the highest was 80% above the lowest). Estimates from a range of permitted root-to-shoot ratios or similar equations differed by 193%, leaving a lot of room for gaming. Evidence suggests that project developers are taking advantage of this and choosing equations which are likely inflating the number of credits issued.

- **BURIED DATA:** Project developers are not required to provide justification for their choice of equations, nor are they required to publish the forest data they use to estimate forest carbon. Of the 12 projects assessed by the researchers, not one developer agreed to share their data.
- **QUESTIONABLE MODELLING:** There is too little scrutiny over the choices of models and the scientific evidence that backs them. In one case, a project used an allometric equation based on a supposed scientific reference which was actually a paper on water nutrients, i.e. had nothing to do with tree biomass.

3.3.3 Recommendations

- **DO THE MATHS:** The VCS should promote the use of allometric and belowground equations, that reflect the most robust and up-to-date scientific research, curated by independent third-parties, e.g. by drawing from existing databases such as GlobalAllomeTree,[11] and are conservative.
- **INDEPENDENT NUMBER CRUNCHING:** All data, models and equations used to calculate the carbon content of forests should be publicly available, enabling independent researchers to reproduce and verify the calculations.
- **FOLLOW THE SCIENCE:** Carbon fraction values (which are used to convert biomass into metric tons of carbon) should be selected from up-to-date literature, and default factors that are applied across multiple forest types in multiple locations should be avoided.
- **ACCOUNTING FOR UNKNOWNS:** Uncertainty should be adequately quantified, distributed (aka "propagated"), and taken into account when measuring the carbon content of forests. To reflect the precautionary principle, carbon accounting should be conservative, and the level of conservativeness should be commensurate with the level of uncertainty.

[11] GlobalAllomeTree (website - consulted on August 1st, 2023)

3.4 Permanence

3.4.1 Introduction

Permanence in REDD+ projects refers to the principle that carbon stored in forests must be maintained over a very long period of time to "offset" the release of fossil carbon. How long this storage should be guaranteed for is the subject of heated debate. From a scientific perspective, if the storage of carbon in a sink is used to compensate for GHG emission from the combustion of fossil fuels, the storage should be guaranteed for at least a duration equivalent to the lifetime of CO2 in the atmosphere. This would require permanence guarantees over several centuries, if not millenia, which is unrealistic, in particular in the context of a forest conservation project. Shorter term storage of carbon can have benefits, such as "buying time" to avoid climate tipping points. But this should still be at least several decades, and under no circumstances should this be considered as equivalent to avoiding or reducing the release of greenhouse gases.

Reversal risk, the risk that carbon is re-released into the atmosphere, is a significant concern in REDD+ projects. Risk factors are classified into three categories: internal risk, which refers to risks that originate within the project (such as project finances and management); external risk, which refers to human-induced risks (such as certainty in land and resource ownership, community engagement and political risks); and natural risk, which refers to risks that arise from natural factors (including fires, extreme weather events and pests).

VCS-REDD+ projects can implement strategies to minimise the risk of carbon loss and maintain the long-term conservation of forests, such as by implementing protection measures, or sustainable land use practices. In addition, the VCS operates a buffer pool, which is a form of insurance against reversals under which each project that faces a reversal risk needs to contribute some of its verified emissions reductions/removals. Credits in the pool can then be drawn from (i.e., cancelled) to compensate for any reversal that is observed in one of the projects. This acts as a pooled insurance mechanism.

3.4.2 Key findings

- **PETRIFIED TO ORGANIC:** Using reductions in forest emissions to offset fossil fuel emissions essentially shifts carbon from stable carbon pools that are millions of years old to short-term, unstable natural sinks, where the risk of release is much higher.
- **UP IN SMOKE:** Natural risks (wildfires, pests and extreme weather events) are heavily underestimated compared to independent scientific analysis. The 75 REDD+ projects in the study sample estimate the risk of their CO2 emission reductions being reversed over a century due to natural events at 2% on average. The researchers estimate that this is underestimated by more than a factor of 10.
- **RISKY ASSUMPTIONS:** Nearly three-quarters of projects report no external risk, and the mean external risk for those that report a risk is a mere 2%. This is not plausible for projects implemented in countries where, among other things, political risk is relatively high. Moreover, a third of projects report no internal risk. For the rest, the mean internal risk is 9%.
- **BELOW THRESHOLD:** The total mean risk facing REDD+ projects was calculated as 15%, and more than half of the projects report a mean risk that is at or below the minimum threshold of 10% that all projects must use under the VCS methodologies. This is a very low risk score. If it were accurate, it would raise questions about the additionality of these projects, as it is illogical to simultaneously claim that forests must be protected against threats and that they are unlikely to be destroyed over a 100 year period.
- **CARBON LIFETIME:** Projects contribute credits to a buffer pool based on the estimated risk of reversal over a 100 year period. This is much lower than the estimated lifetime of CO2 in the atmosphere, which is several centuries to millennia.

3.4.3 Recommendations

- **KEEP IT IN THE GROUND:** Storing carbon in forests should not be used as a way of offsetting emissions from the combustion of fossil fuels. Such false equivalence leads to a shift of carbon from very stable geological storage of fossil fuels to volatile storage in living forests that are at risk of deforestation.

- **SAFETY FIRST:** Across the board, the reversal risk estimates used by projects must be increased. Risk estimates must be based on robust scientific evidence rather than wishful thinking. If buffer pools are used, the buffer pool contributions should be revised upwards accordingly.

- **TEMPORARY BUFFERS:** Buffer pools should not be presented as a way of insuring against the risk of reversal permanently, as there are serious questions about whether Verra, or any other similar organisation, will still exist in several decades to operate such a buffer pool. In addition, buffers do not create meaningful incentives for project developers to avoid reversals after the end of the monitoring period.

- **STRONGER GUARANTEES:** If storage is guaranteed for X years, then monitoring, and compensation, of reversals should be carried out for that number of years following the *vintage year* of the credit (i.e. the year in which the emission reduction occurred) rather than for X years following the *start of the crediting period*. This is to continue holding landowners accountable for "intentional" reversals. In addition, given the difficulty of accurately quantifying the risk of reversal ex-ante, ongoing monitoring allows to observe reversals and therefore adapt the buffer contributions of all projects accordingly to prevent the depletion of the buffer pool.

3.5 Safeguards

3.5.1 Introduction

Safeguards are a series of social and environmental policies and measures that aim to guard people and the environment against harm.

Safeguards are an essential feature of REDD+ because projects carry significant risks of doing harm when not implemented carefully. Forest conservation projects often require close collaboration with local communities and indigenous peoples. A range of safeguards exist in the context of REDD+, including some developed by governments and international bodies (under the UNFCCC or the Green Climate Fund) and some developed by private standards (such as those developed under the VCS). However, their concrete implementation on the ground has not been a success story, and investigations have uncovered too many cases of grave harm caused by REDD+ projects.

3.5.2 Key findings

- **LINGUISTIC AMBIGUITY:** The policy language used to express VCS safeguards is ambiguous and opaque. It provides limited guidance, leaving the door open for project developers and validation and verification bodies (VVBs) to interpret VCS rules in whatever way they deem appropriate.
- **FALLING BEHIND THE CLASS:** VCS safeguards are less stringent than what is currently considered "best in class", such as the International Finance Corporation (IFC) performance standards and the Green Climate Fund (GCF) safeguards. They also fail to explicitly recognise indigenous rights.q`
- **VERIFIABLE FAILURES:** VVBs bear a major responsibility for the failures of the VCS safeguarding policies. The study highlights several cases where VVBs blatantly ignored severe impacts and simply "rubber-stamped" projects.

3.5.3 Recommendations

- **TOP OF THE CLASS:** Safeguard policies should be reviewed to align with best-in-class international standards, such as by including an explicit recognition of indigenous rights and developing a more appropriate system to hold project developers and implementers accountable for any harms generated by their projects.
- **RIGOROUS SCRUTINY:** The role of VVBs is not simply to rubber stamp projects, they must also scrutinise them and carry out sufficient due diligence. VVBs should apply safeguard policies strictly, ensuring that projects which do not comply or which are causing harm to local communities, indigenous peoples, or the environment, do not get approved or have their approval withdrawn.
- **CHANNEL FOR GRIEVANCES:** An independent mechanism that tackles grievances and offers redress should be accessible free of charge for communities that are negatively affected by (REDD+) projects.[12]
- **BUYERS NEED TO DO DUE DILIGENCE**: Since well implemented safeguards can help protect people but do not guarantee harm is avoided, credit buyers should still do careful due diligence before procuring credits from a REDD+ project.

[12] For more information about grievance mechanisms in carbon markets, see our report 'Blocked avenues for redress: shedding light on carbon market grievance mechanisms' (2023)

4. CONCLUSION

Current REDD+ methodologies for projects are failing to deliver quality climate action and to ensure that projects deliver on their claims. These methodologies leave people living in or near projects and the local environment vulnerable to harm and exploitation, and leaves major loopholes for project developers to exaggerate the impacts of their projects. This is largely due to the excessive level of flexibility and discretionary space that these methodologies leave to project developers and auditors. This opens the door to gaming and cherry picking approaches that maximise credit issuance by projects at the expense of the climate, environment, local communities and indigenous peoples.

As Verra is in the process of revising its approach to REDD+ and designing a new consolidated methodology, it is imperative that it addresses the gaps and loopholes that enable project developers to engage in these problematic practices. This requires adopting stricter methodologies and policies and aligning its standards with the most up-to-date and robust science.

Ultimately, it is illusory to assume that forest conservation activities can be used to compensate for greenhouse gas emissions from the combustion of fossil fuels. They must not be lumped together into a single net value and accounting for their impacts must remain separate. This should not deter companies and governments from financing forest conservation, in particular for primary forests, but this should be done without using these investments to claim the offsetting of emissions.

CARBON MARKET WATCH

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