

PROJECT PRESERVATION

Understanding the role of credits from High Forest Low Deforestation (HFLD) jurisdictions in climate mitigation portfolios

This document provides a science-based and practicable brief outlining the importance of purchasing carbon credits from High Forest Low Deforestation (HFLD) jurisdictions.

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TABLE OF CONTENTS

Executive Summary

Introduction

7 | A deeper look

Section 1. The importance of forests in HFLD jurisdictions

Section 2. The case for corporate support for HFLD jurisdictions

11 | 2.1 Why credits from HFLD jurisdictions are additional

14 | 2.2 How credits from HFLD jurisdictions promote permanence of outcomes

15 | 2.3 How credits from HFLD jurisdictions can help mitigate international leakage

Section 3. Corporate action and use of credits from HFLD jurisdictions

18 | 3.1 Considerations for including credits from HFLD jurisdictions in a climate mitigation portfolio

19 | 3.2 Beyond carbon: the many values of forest preservation in HFLD jurisdictions

20 | 3.3 Attributes of robust HFLD crediting programs

21 | 3.4 A corporate call to action

Supplementary Backgrounder: Carbon finance for REDD+ and credits from HFLD jurisdictions

24 | Climate and forest finance

25 | Standards that include HFLD countries and jurisdictions

An aerial photograph of a vast, lush green forest. A winding river flows through the center of the forest, with a small boat visible on its surface. The forest extends to the horizon, where a prominent, rounded hill or volcano is visible under a clear sky. The lighting suggests a bright, sunny day, with the trees appearing vibrant green and yellow.

EXECUTIVE SUMMARY

We are facing a planetary emergency: having already reached 1.1 °C warming, the world must reduce global carbon dioxide emissions by 45% by 2030 (relative to the 2010 level) and reach net zero around mid-century to maintain a 1.5 °C global warming pathway. This requires halting deforestation by 2030. To truly halt deforestation, however, it is necessary to simultaneously stop active deforestation and protect the remaining forests where deforestation would move next. These intact forests safeguard the crucial ecosystems that are so indispensable for climate, biodiversity, ecosystem services, and Indigenous Peoples and local communities.

This goal cannot be met without the continued contribution of forests from **High Forest Low Deforestation (HFLD)** jurisdictions. HFLD jurisdictions are generally defined as areas with high forest cover and low historical rates of deforestation. Many contain vast expanses of intact forests, which make up only about a quarter of the world's remaining forests globally but have a disproportionate impact on climate regulation. These forests have accumulated large amounts of irrecoverable carbon stocks over centuries, provide strong biophysical cooling effects, and also comprise a majority of the global terrestrial sink that absorbs around 30 percent of human global emissions each year, mostly in the tropics.

At the same time as deforestation and degradation must decrease and forests must be restored and protected from new threats, economies of forest countries must have a means to continue to grow. Market incentives must provide sufficient financing to create viable alternative development pathways that assign a value to standing forests that is greater than that of the alternative land use, such as mining or agriculture. To date, carbon markets have focused on the protection of forest areas which have experienced high rates of historical deforestation, and the sale of credits from the amount of deforestation reduced below historical averages. The use of historical baselines in determining the level of crediting may be conservative, but for jurisdictions where deforestation is already low, it results in little or no crediting and therefore, no market incentive to continue or expand action against ongoing, shifting and emerging threats to standing forests. Over the past decade, this has resulted in extremely limited access to most public climate finance for preservation of the world's most intact forests (close to a billion hectares) that are mainly located in HFLD jurisdictions.

Carbon crediting from HFLD jurisdictions is now emerging as an immediately available and complementary market-based solution for protecting these forests at a time when ambitious action is urgently needed. By using these HFLD crediting approaches, jurisdictions with extensive intact forests can access carbon finance. Approaches for HFLDs have been developed to enable issuance of fungible emission reduction credits. A key example is ART (Architecture for REDD+ Transactions) TREES (The REDD+ Environmental Excellence Standard), a standard that sets out robust requirements for quantifying emissions reductions from jurisdictions that reduce deforestation and forest degradation and includes an approach to credit HFLD jurisdictions.

Credits from HFLD jurisdictions issued under these bespoke accounting rules are relatively new to the marketplace, and this paper contributes to emerging guidance on their fungibility and suitability for use in offsetting in corporate portfolios, alongside other types of carbon credits. As a group of leading NGOs and recognised market facilitators, we have convened to build support for credits from HFLD jurisdictions and provide guidance to company leaders, sustainability portfolio managers and government buyers.

Our organizations assert that credits from HFLD jurisdictions with attributes of high environmental and social quality from robust jurisdictional REDD+ programmes are fungible with other types of credits, and should play a crucial role in balanced and diversified corporate credit portfolios. (REDD+ stands for Reducing Emissions from Deforestation and Degradation; see Supplement for more background.) Forest credits from HFLD jurisdictions meet the principle of *additionality*, because human intervention is necessary for forests in HFLD jurisdictions to remain intact. Without such interventions, such forests will continue to be lost at unacceptably high rates, and pressures on these forests are expected to increase – materializing rapidly and unpredictably. Crediting of HFLD jurisdictions also promotes the principle of permanence of forest protection outcomes, providing jurisdictions with a pathway to continue receiving carbon finance even after deforestation falls in recognition that the threats do not cease. Crediting of HFLD jurisdictions can also play an important role in *minimizing domestic and international leakage* by providing jurisdictions with the resources and incentives to implement programs that more holistically address leakage within their boundaries and resist the spread of deforestation from beyond their own borders.

Ambitious corporate action that leverages carbon markets can play a crucial role in combating the climate crisis. ***Corporate leaders can and should make decisions today to include a meaningful amount of credits from HFLD jurisdictions for purchase in the near term.*** We recommend a balanced approach, with support for HFLD jurisdictions occurring alongside other emissions reduction efforts and investments in future emission removals within their climate mitigation strategies.

Credits from HFLD jurisdictions represent a credible and impactful pathway for implementing decarbonization pledges—and beyond to Nature-Positive action—by safeguarding these crucial ecosystems that play such important roles for climate, biodiversity, ecosystem services, and Indigenous Peoples and local communities.

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About us

About Climate Impact X

Climate Impact X (CIX) is a global marketplace and exchange for quality environmental credits based in Singapore. Jointly established by DBS Bank, Singapore Exchange (SGX Group), Standard Chartered and Temasek, the company is bringing to market and helping to scale the next wave of impactful carbon sequestration solutions through a suite of trading venues that are underpinned by trust. The CIX Project Marketplace offers quality carbon credits that can meet corporate sustainability objectives. CIX's Auction platform is a specialized digital venue for discovering prices of unique credit types, newly issued credits and customised portfolios of projects through the efficient aggregation of market supply and demand. The exchange (launching in 2023) will enable two-way spot trading of quality credits through standardized contracts, providing the market with clearer price transparency and risk management solutions.

About Conservation International

Conservation International protects nature for the benefit of humanity. Through science, policy, fieldwork and finance, the organization spotlights and secures the most important places in nature for the climate, for biodiversity and for people. With offices in 30 countries and projects in more than 100 countries, Conservation International partners with governments, companies, civil society, Indigenous peoples and local communities to help people and nature thrive together.

About Emergent Climate

Emergent is a U.S. non-profit that serves as an intermediary engaging between tropical forest countries and the private sector to mobilize finance to support emissions reductions in deforestation. It does this by developing and bringing practical, credible and largescale forest protection solutions

to market. Emergent serves as the coordinator of the LEAF Coalition. Launched during President Biden's Leaders' Summit on Climate in April 2021, LEAF is a public-private initiative designed to accelerate climate action by providing results-based finance to countries committed to protecting their tropical forests. Its participants, which include the US, UK and Norwegian governments, together with 20 global companies, have already mobilized more than \$1 billion.

About Natural Climate Solutions Alliance

The Natural Climate Solutions Alliance (NCS Alliance) brings together public and private stakeholders to identify opportunities and barriers to investment into carbon credits in new and existing markets to scale up financing for natural climate solutions. The Alliance also serves as a forum for knowledge sharing and technical capacity building to ensure natural climate solutions reach their full potential in abating climate change. Natural Climate Solutions contribute their full potential towards the Paris Agreement climate goals as well as helping to solve some of the world's most pressing and intractable environmental and social challenges, including biodiversity and forest loss, land degradation, sustainable water management and sustainable community livelihoods, starting today.

About Wildlife Conservation Society

Wildlife Conservation Society saves wildlife and wild places worldwide through science, conservation action, education, and inspiring people to value nature. To achieve its mission, WCS, based at the Bronx Zoo, harnesses the power of its Global Conservation Program in nearly 60 nations and in all the world's oceans and its five wildlife parks in New York City, visited by 4 million people annually. WCS combines its expertise in the field, zoos, and aquarium to achieve its conservation mission.



INTRODUCTION

This paper explains why credits from **High Forest Low Deforestation (HFLD)** jurisdictions resulting from robust jurisdictional REDD+ (Reducing Emissions from Deforestation and Degradation) programmes are fungible with other types of credits, offer valuable co-benefits and should play a crucial role in balanced and diversified corporate carbon credit portfolios. It also outlines why building strong demand for these credits, alongside other reductions and removals credits, is vital for the achievement of the Paris Agreement goal of keeping 1.5 °C warming within reach.

We are facing a planetary emergency: having already reached 1.1 °C warming, the world must reduce global carbon dioxide emissions by 45% by 2030 (relative to the 2010 level) and reach net zero around mid-century to maintain a 1.5 °C global warming pathway.¹ This includes halting deforestation by 2030. To truly halt deforestation, however, it is necessary to simultaneously stop active deforestation and protect the remaining forests where deforestation would move next. Public funding approaches alone have not been sufficient to reach the scale of action required to meet these targets, and especially to secure the full contribution of nature preservation to climate mitigation. At the same time as deforestation and degradation must decrease and forests must be restored and protected from new threats, economies of forest countries must have a means to continue to grow. Developing countries must have a pathway to pursue legitimate development aspirations including providing new jobs, building financial capital to fund social services, and developing education and health systems while preserving the world's forests. This has become

even more difficult post-Covid given how many developing country economies have been negatively impacted. The carbon market can play a key role in providing the financial incentives to make this a reality.

Ambitious corporate action that leverages carbon markets can play a crucial role in combating the climate crisis by providing the financing needed to incentivize protection and restoration of forests. Estimates of demand for carbon credits in the voluntary market in 2030 range from 0.5-2 Gt/year.² Many companies are already using credits from emissions reduction and carbon removal projects to counterbalance any remaining unabated emissions on their path to decarbonization³ Credits from HFLD jurisdictions are complementary to these other categories, since they come from the *protection* of standing forests from current and emerging threats, issued under specialised accounting rules for jurisdictions. They are new to the marketplace, and this paper outlines their fungibility⁴ and suitability for use as offsets in corporate portfolios, alongside other carbon credits.

WHAT IS HFLD?

HFLD = “high forest low deforestation,” is a designation that can apply to countries, jurisdictions, and indigenous territories, but generally does not apply to project-level activities. HFLD areas have been identified in a few different ways over the years, but are generally defined as areas with high forest cover and low historical rates of deforestation. One frequently used approach from da Fonseca et al (2007) applies the term HFLD to countries that have forest cover greater than 50% and an average annual deforestation rate lower than the global average during the 10-year reference period (initially set at 0.22% forest loss per year).⁵ The Paramaribo Declaration⁶ adopts the da Fonseca et al definition that HFLD countries are those having more than 50% forest cover and a deforestation rate under 0.22%. Based on FAO’s Forest Resources Assessment (2015), 24% of the world’s forests (close to a billion hectares) are located in HFLDs.

A provisional, unpublished estimate of REDD+ eligible countries produced by WCS, using the definition of HFLD in TREES 2.0 (see Box 3), found that there were 12 HFLD countries, 9 countries with HFLD subnational jurisdictions, and 39 HFLD subnational jurisdictions as of 2020.⁷ These 37 jurisdictions together contained 498 million ha of forest, a more conservative estimate than FAO’s.



A Deeper Look

The ability of HFLD jurisdictions to access carbon markets is particularly important because many contain vast expanses of intact forests, which are indispensable to meeting Paris Agreement targets.

To date, carbon markets have focused on the protection of forest areas which have experienced high rates of historical deforestation, and the sale of credits from the amount of deforestation reduced below historical averages. The use of historical baselines in determining the level of crediting may be conservative, but for jurisdictions where deforestation is already low, it results in little or no crediting and therefore, no market incentive to continue or expand action against ongoing, shifting and emerging threats to standing forests. Over the past decade, this has resulted in extremely limited access to mostly public climate finance for preservation of the world's most intact forests (close to a billion hectares) that are mainly located in HFLD jurisdictions.⁸

Because REDD+ market finance has predominantly gone to areas experiencing higher rates of deforestation, countries are not incentivized to choose development options that protect forests. Instead, they can choose pathways that include deforestation now knowing that later, there will also be an opportunity to receive finance to transition to other models that reduce deforestation and to restore forests. To have the most sustainable, immediate impact, carbon markets must incentivize jurisdictions to make choices that drive economic development that values intact forests now.

Carbon crediting from HFLD jurisdictions is now emerging as an immediately available and complementary market-based solution for protecting these forests at a time when ambitious

action is urgently needed. By using these HFLD crediting approaches, jurisdictions with extensive intact forests can access carbon finance. Approaches for HFLDs have been developed to enable issuance of fungible emission reduction credits. A key example is ART (Architecture for REDD+ Transactions) TREES (The REDD+ Environmental Excellence Standard), a standard that sets out robust requirements for quantifying emissions reductions (ERs) from jurisdictions that reduce deforestation and forest degradation and includes an approach to credit to HFLD jurisdictions. The HFLD approach provides a new pathway for companies to directly invest in securing some of the highest-carbon forests on the planet.

This document contains three sections:

SECTION 1 details the importance of forests in HFLD jurisdictions to overall climate mitigation.

SECTION 2 provides evidence for why corporates should support crediting from HFLD jurisdictions for meeting fundamental criteria for fungibility and enhancing the overall impact of forest carbon credit portfolios.

SECTION 3 lays out multiple use cases for credits from HFLD jurisdictions and how they anchor many other essential values and benefits, leading to a call for corporate action to make meaningful purchases of credits from HFLD jurisdictions.





SECTION 1.
**THE IMPORTANCE
OF FORESTS IN HFLD
JURISDICTIONS**

Section 1. The importance of forests in HFLD jurisdictions

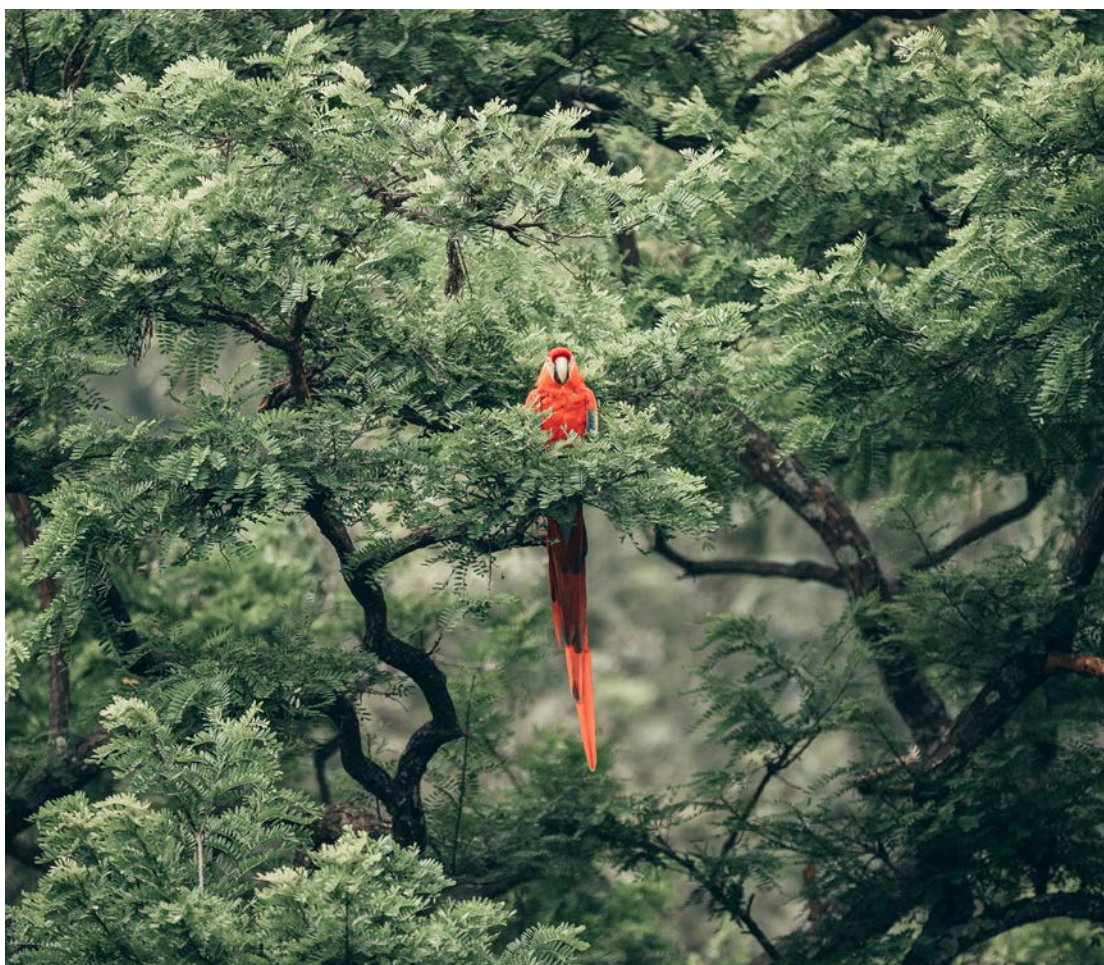
Though intact forests make up only about a quarter of the world's remaining forests globally,⁹ they have a disproportionate impact on climate regulation.

These forests have accumulated a high amount of irrecoverable carbon stocks over centuries¹⁰ and this accumulation continues to this day: over 400 million metric tons of carbon (C) per year of net uptake, or close to 30 percent of human global emissions each year, mostly in the tropics,¹¹ even after emissions from human damage are factored in.¹² Intact forests also comprise a majority of the global terrestrial sink that absorbs That is equivalent to the annual greenhouse gas emissions from 344 million conventional automobiles.¹³

Intact forests also provide strong biophysical cooling effects not related to greenhouse gases (GHG).¹⁴ Without them, our planet would likely be at least half a degree C warmer than it is today.¹⁵ The contribution of these forests is built into existing climate models for keeping global warming well below 2 °C , which assume they will remain sufficiently intact and resilient to human pressures.¹⁶

However, the value of intact forests as both storehouses and active sinks of carbon plummets when they are cut down or degraded, removing an essential natural brake on climate change. Degradation triggers a cascade of ongoing emissions from these forests and makes them less resilient to further degradation, including from climate change impacts. It is estimated that the loss of intact forest causes about six times the carbon impact, in terms of emissions and lost sequestration, then from deforestation alone.¹⁷

Because of their disproportionate significance, protecting the world's remaining intact tropical forests is essential to keep a 1.5 °C future within reach. This is why it is essential and strategic for companies to include credits from HFLD jurisdictions as part of their offset portfolios.





SECTION 2.
**THE CASE FOR
CORPORATE
SUPPORT FOR HFLD
JURISDICTIONS**

- 2.1** Why credits from HFLD jurisdictions are additional
- 2.2** How credits from HFLD jurisdictions promote permanence of outcomes
- 2.3** How credits from HFLD jurisdictions can help mitigate international leakage

Section 2. The case for corporate support for HFLD jurisdictions

This section details:

2.1 Why credits from HFLD jurisdictions are additional

2.2 How credits from HFLD jurisdictions promote permanence of outcomes

2.3 How credits from HFLD jurisdictions can help mitigate international leakage

Companies are not the only sources of finance for HFLD jurisdictions – a few public sources of finance have supported some jurisdictions, though not in a comprehensive way. The private sector has made even fewer contributions.¹⁸ In part, the private sector has been reluctant to invest because of a lack of clarity about how these credits can be used and what claims can be made about them, or how they fit into a broader portfolio of climate mitigation investments. Media stories have mischaracterized these credits as “not additional,” causing concerns among potential buyers. Below, we address these points and provide a range of ways that corporate buyers can justify investing in credits from HFLD jurisdictions.

2.1 Why credits from HFLD jurisdictions are additional

Demonstrating “additionality” refers to the process of showing that the beneficial effect of an intervention would not have occurred in the absence of the intervention. Judged on the basis of their past track record of low deforestation, the “business-as-usual” future for HFLD areas might seem to be that they will continue to exist largely unchanged. However, there is ample evidence that many forests in HFLD jurisdictions are at risk.

Loss of forests in HFLD jurisdictions is currently occurring and increasing. For example, since 2000, the destruction of primary forests in the tropics has contributed 22% of all forest-related emissions.¹⁹ From 2000 to 2020 we lost about 12% of intact forest landscapes, the planet’s most intact forests, or 0.6% per year.²⁰ If the losses continue at this pace, half of the world’s most intact forests will be cleared, degraded or fragmented by 2100. Recent trends suggest that the rate is actually accelerating as the global footprint of intensive human activity spreads ever wider. Some countries have already lost HFLD status due to increased deforestation rates or a drop in total forest cover, including five in the period from 2010 to 2019: Cambodia, Colombia, Laos, Samoa, Sao Tome and Principe, and Zambia.²¹

Threats to forests in HFLD jurisdictions can shift relatively rapidly and unpredictably. With a 58% coverage of forests in 2005 and an average deforestation rate of 0.1% per year from 1990 to 2000, Colombia was classified as a HFLD jurisdiction as of 2007 using the da Fonseca et al. approach (2007).²² An updated analysis using the same approach to calculate HFLD countries saw Colombia lose their status by 2019.²³ In the decade to 2019, Colombia lost 2.41Mha of its tree cover, equivalent to a 3.3% decrease in tree cover since 2000, and 1.43Gt of CO₂e emissions²⁴ due to illegal mining, logging, cocoa farming, and, most importantly cattle ranching.²⁵

Similar stories have played out elsewhere. In the 2000s, surging demand for animal feed, combined with development of more robust soybean varieties, triggered the wholesale conversion of some Amazonian landscapes to soybean fields.²⁶ An economic crisis in the late 2000s, triggered by the real estate market and other factors, caused a sharp rise in the price of gold, suddenly making remote deposits of gold economically viable to recover. This led to incursions of gold mining operations in Guyana and Suriname, as well as the devastation of forested river systems in Peru.²⁷ Later, rising demand for cooking oil in Asia contributed to the explosion of oil palm plantations in Indonesia and Malaysia, which soon spilled into parts of Africa and South America.²⁸ In each case, deforestation suddenly appeared in previously untouched areas.

Human intervention is necessary for forests in HFLD jurisdictions to remain intact. A recent analysis (Figure 1) shows how anthropogenic fires and deforestation activities have encroached upon Indigenous territories in the Amazon Basin in recent years. As pressures have drawn closer, and in some cases surrounded their territories, these areas have remained largely intact. This has not been by accident – it has been due to the persistent and diligent efforts by Indigenous Peoples and Local Communities (IPLC) to defend their forest assets. An FAO synthesis of over 250 academic studies found that in nearly every country in

Latin America, Indigenous and tribal territories have lower deforestation rates than other forest areas.²⁹ Threats have evolved and grown as they have drawn closer, requiring IPLC communities

to increase the sophistication and scale of their efforts. In this sense, the additionality of their efforts is clear, even though the state of the forests is largely unchanged.

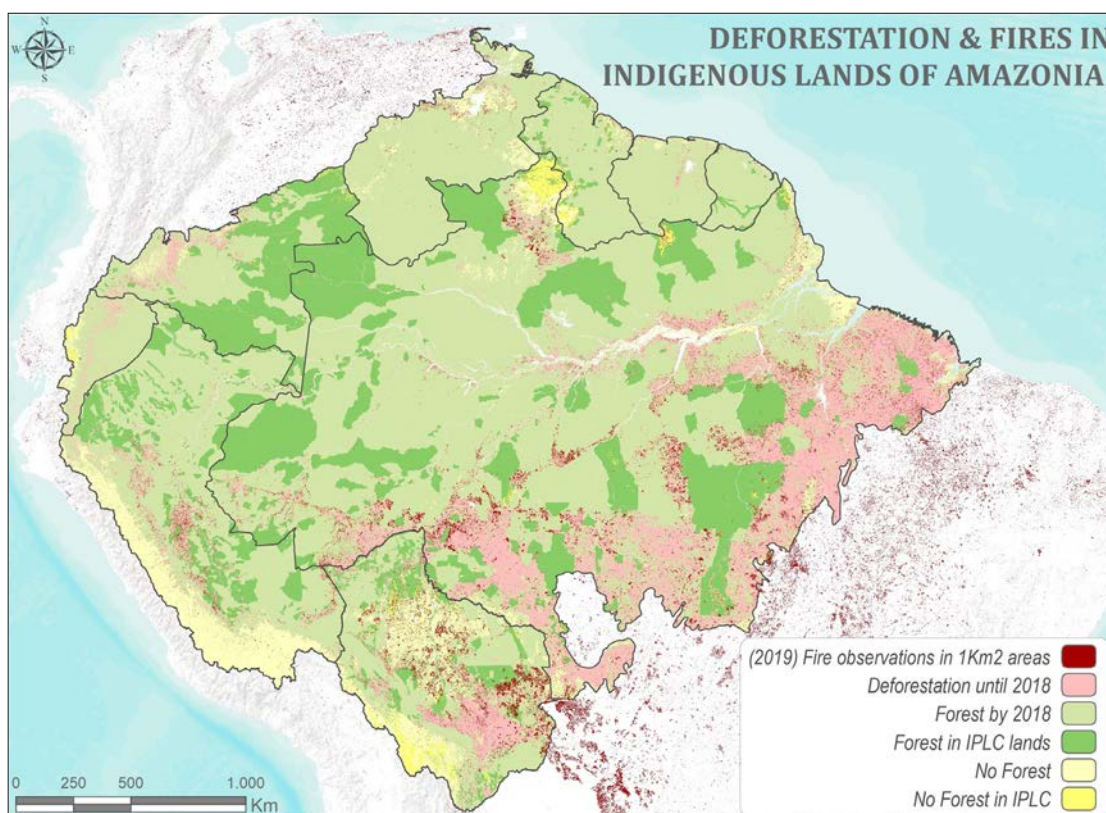


Figure 1. Recent locations of fires and deforestation in relation to indigenous territories in the Amazon Basin

Crediting approaches for HFLD jurisdictions are designed to avoid over-crediting through two mechanisms.

1. **Selective eligibility criteria:** As noted, there are different definitions of HFLD and a crediting program should be transparent regarding its eligibility criteria and ensure verification of the HFLD status for programs. Limiting participation in the crediting approaches to only those jurisdictions that are most successful in keeping deforestation low and restoring forest cover where necessary helps ensure the additionality of the credits claimed.
2. **Baseline setting designed to prevent over-crediting:** Baselines are key to determining the number of credits that a jurisdiction will generate as annual emissions or removals are compared against the baselines to calculate the number of credits to be awarded. It is important for high-integrity baselines to be developed that issue credits for emission

reductions and/or removals that would not happen in a business-as-usual scenario. For HFLD jurisdictions establishing a baseline can be challenging, as they have had a positive performance in terms of deforestation rates in the past. As a result, the historical reference level of forest emissions is quite low. However, their forest carbon stocks are still under threat due to increasing demand for land from several activities (mining, infrastructure, agriculture, cattle, etc.) as discussed in previous sections. Hence, in developing a crediting level for these jurisdictions, it is advisable to use a consistent baseline that includes historic performance as well as a conservative estimation of the percentage of carbon stock under threat or an adjustment of the historic baseline that is conservative and consistent. ART TREES, for example, assigns credits to eligible jurisdictions based on a conservative estimate of the forest carbon stock at risk (See box 3). Even for a high-forest cover country like Guyana, this approach yields a very limited number of credits.



CASE STUDY ON THE HFLD CREDITING APPROACH IN ART TREES 2.0

Jurisdictions are eligible to use the HFLD crediting approach in TREES 2.0 if their HFLD Score is greater than 0.5 for each year of the reference period. The score was designed around historical definitions of HFLD to incorporate two factors, based on the forest cover and the rate of deforestation. This approach raises ambition while providing flexibility as ART recognizes that each jurisdiction's circumstances are different.

Examples of scores for hypothetical jurisdictions are:

Forest Cover	Deforestation Rate	HFLD Score
60%	0.1%	0.5 - HFLD
70%	0.3%	0.4 - NOT HFLD
80%	.49%	0.31 - NOT HFLD
55%	0.05%	0.5 - HFLD

The formula for establishing the crediting level in TREES for HFLD jurisdictions is the average historical emissions across the reference period plus a factor equalling the average HFLD score across the reference period * 0.05% * the carbon stock. This approach was derived from available literature, input received from an expert committee and during the public consultation process, and the values used in other GHG programs. It is based on verifiable data inputs making it transparent and consistent across all jurisdictions.

For a country like Guyana, whose average HFLD score is 0.79, the final factor becomes $0.79 \times 0.05\%$ which translates to 0.04% of the carbon stock. This is 6,849,327 tCO₂e which is equivalent to approximately 5,646 hectares (56 square kilometres), or roughly the area that would be deforested by less than 2.5 average soya farms. When compared to the total area of forest in the TREES accounting area of over 18,000,000 hectares, it should be noted that the area credited for being under threat is quite small.

2.2 How credits from HFLD jurisdictions promote permanence of outcomes

Credits from HFLD jurisdictions can be a logical part of corporate offsetting portfolios because they provide financial incentives for ongoing forest protection and for alternative economic development pathways to be developed within forest countries, helping to avoid the risk of 'reversal', or the loss of a forest that has previously been credited with reducing emissions.

The forest transition theory suggests that corporate investments can help jurisdictions prevent or minimize the time and extent of deforestation by providing an economic pathway for a forested jurisdiction to move from deforestation to forest preservation. To help jurisdictions make this transition, offset buyers' initial focus should be on supporting the jurisdiction to reduce deforestation, funded by emission reductions credits. Where jurisdictions achieve very low levels of deforestation, credits from HFLD jurisdictions can provide finance to continue reversing historic deforestation, expanding forest cover, and generating removals credits through national REDD+ programs. If successful, this process should provide incentives to bring deforestation down to levels approaching zero and keep it there. However, in the absence of carbon finance received, HFLD jurisdictions would encounter a 'financing cliff' in which they would become the victims of their own success, removing themselves from eligibility for carbon finance once they achieve their goals. Without carbon credits as a prospective source of finance, HFLD jurisdictions have a perverse incentive to allow deforestation to tick up again and undermine the permanence of past efforts to preserve a jurisdiction's remaining

forests. Carbon market support of credits from HFLD jurisdictions also provides a pathway for jurisdictions to continue participating in the monitoring, reporting and verification of their efforts. This ongoing accountability also helps prevent reversals.

By purchasing credits from HFLD jurisdictions, companies (along with governments and multilateral organizations) can provide the antidote to this perverse outcome, through the establishment of ongoing incentives for forest protection in HFLD jurisdictions. All actors, especially jurisdictional governments, need to see that the transition is not a one-time event, but rather a reconfiguration of continued financial flows in a way that is conducive to sustained forest protection. Companies should expect to play a role in this new configuration into the future, even as the supporting mechanisms and policies evolve over time.

Companies participating in the carbon markets should view credits from HFLD jurisdictions as playing an ongoing role in buttressing the integrity of all forest credits, in addition to the protection they provide for HFLD jurisdictions themselves.



2.3 How credits from HFLD jurisdictions can help mitigate international leakage

Credits from HFLD jurisdictions can also play an important role in addressing a more near-term issue: compensating for international leakage. 'Leakage' refers to the shifting of deforestation pressure from one place to another and can undermine the integrity of the carbon markets overall.

The agricultural products driving much deforestation³⁰ can be produced in many places, based on ecological, not political, boundaries. Leakage might occur within a country – from a high deforestation state in Brazil to HFLD states like Amazonas or Amapá – or across national borders.

Most current REDD+ standards account for **domestic** leakage by reducing the number of credits issued: more potential leakage to other jurisdictions results in fewer credits. However, with a steady source of finance from credits generated by HFLD jurisdictions, those jurisdictions will have the resources and incentives to implement programs that will implement jurisdiction-wide programs to better address domestic leakage and that will resist the spread of deforestation from **international** sources, which is not yet addressed by existing mechanisms. With finance from

credits from HFLD approaches, jurisdictions can build the political consensus needed to prevent deforestation, help strengthen regulations and enforcement, and direct investment into activities that counter forest destruction.

The entry of credits from HFLD jurisdictions into the market may also provide the incentives to reduce leakage at a larger, more systemic scale. International leakage - the spread of deforestation to areas far from a given project – is much more difficult to evaluate, but because credits from HFLD jurisdictions are issued at the jurisdictional (often country) scale, they could play a role in counteracting leakage that occurs due to shifting global supply chains.

By supporting HFLD jurisdictions directly, companies can make sure their financial support for forests helps combat deforestation globally.



An aerial photograph of a wide river with a large, light-brown sandbar in the center. The riverbanks are covered in dense green forest. The sky is visible in the upper left corner, reflecting on the water.

SECTION 3. **CORPORATE ACTION AND USE OF CREDITS FROM HFLD JURISDICTIONS**

- 3.1** Considerations for including credits from HFLD jurisdictions in a climate mitigation portfolio
- 3.2** Beyond carbon: the many values of forest preservation in HFLD jurisdictions
- 3.3** Attributes of robust HFLD crediting programs
- 3.4** A corporate call to action

Section 3. Corporate action and use of credits from HFLD jurisdictions

We call for corporates to include credits from HFLD jurisdictions in their overall portfolio of carbon credits in a way that:

1. Is aligned with science;
2. Provides sufficiently timely incentives to existing HFLD countries to preserve their forests; and
3. Supplements other types of high-quality carbon credits.

These steps are summarized in Figure 2 and detailed below.

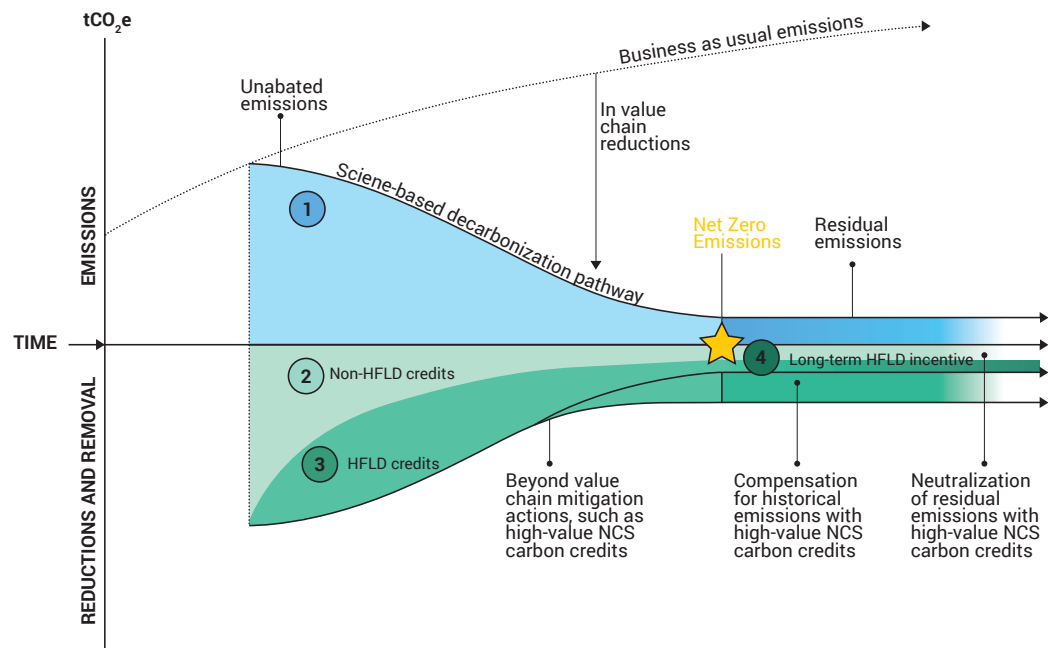


Figure 2. Incorporation of credits from HFLD jurisdictions into a portfolio of carbon credits

Figure 2: Conceptual representation of how companies can utilize credits from HFLD jurisdictions in their pathway to decarbonization, adapted from the Natural Climate Solutions Alliance (NCSA). We added the numbering and shaded in credits from HFLD jurisdictions to demonstrate how these could play a role in an overall crediting portfolio. According to the Science Based Targets Initiative (SBTi), “beyond value chain mitigation” refers to mitigation action or investments that fall outside of a company’s value chain.³¹ This includes activities that avoid or reduce greenhouse gas emissions, and those that remove and store greenhouse gases from the atmosphere, such as purchasing high quality, jurisdictional REDD+ carbon credits that support countries in raising the ambition on and, in the long-term, achieving their nationally determined contributions. “Compensation for historical emissions” refers to credits applied to compensate for emissions that occurred within the value chain during the time period before the corporate commitment was adopted.

Step 1 – Decarbonize and neutralize: Corporate sets science-aligned targets,³² aiming to minimise GHG emissions to a state of Net Zero in the medium term (grey line).

Step 2 – Counterbalance: Recognising the urgency of decarbonizing, corporates not only reduce emissions over time, but also counterbalance unabated emissions (light blue shaded areas under the upper curve) in the short-term using high-integrity carbon credits (green areas above the lower curve). Decarbonizing plus counterbalancing is called the High Ambition Pathway.

Step 3 – Purchase credits from HFLD jurisdictions: Crucially, companies incorporate credits from HFLD jurisdictions as a significant proportion of their credit portfolio (darker green area under the curve). The proportion that is included is described in more detail in section 3.1.

Step 4 – Provide long-term support to HFLD jurisdictions: As companies’ GHG footprints shrink, the number of carbon credits they purchase will decrease since they will have fewer emissions to counterbalance. However, there will still be a long-term need to support HFLD jurisdictions to mitigate the risk of threats resurging and reversals beginning to occur. The private sector can play a critical role in providing continued finance to these forests through the purchase of credits from HFLD jurisdictions, potentially supporting corporate targets for social and biodiversity impacts.

3.1 Considerations for including credits from HFLD jurisdictions in a climate mitigation portfolio

As high-quality credits from HFLD jurisdictions become available, companies should consider how to best include them in their portfolio.

Credits from HFLD jurisdictions represent just one of the many necessary climate mitigation investments that will be required to achieve collective global goals. While some companies may choose to prioritize the purchase of these credits, we recommend that each company seek to build a balanced portfolio of approaches over time in their beyond value chain mitigation strategies – one that includes support for HFLD jurisdictions alongside complementary investments in other emissions reductions and emission removals. A holistic portfolio will ensure that investments are mutually reinforcing and comprehensive: necessary conditions to achieve forest and climate goals.

The proportion of credits from HFLD jurisdictions within the overall portfolio will differ by company, according to its own priorities and goals. For example, a company might include credits from HFLD jurisdictions in its climate investment portfolio for any or all of the following strategic reasons (among others):

- If a company's supply chain/sourcing of raw materials overlaps with specific HFLD jurisdictions, they might consider purchasing credits from HFLD jurisdictions from those specific jurisdictions;
- If a company has goals associated with social justice and equity, purchase of credits from an HFLD jurisdiction, especially one with a program developed in partnership with IPLC, could help meet the corporate goal;
- Since roughly a quarter of deforestation occurs in primary/intact forests, purchasing credits from HFLD jurisdictions in the range of 25% of the overall offset portfolio would align an individual company's portfolio with global trends;
- Alternatively, a company could initially include credits from HFLD jurisdictions as a small percentage of their total offset portfolio. This sends the demand signal for credits from HFLD jurisdictions to support the supply pipeline development while allowing the company to obtain price discovery;
- Initial credit purchases from HFLD jurisdictions could be determined by available supply;

Companies could signal an intention to purchase a quantity of the initial credits available under ART TREES standard once available through forward purchase agreements and/or forward finance agreements.

Below, we provide more robust considerations for various rationales or use-cases that may support the purchase of credits from HFLD jurisdictions as a contribution to climate and forest strategies.

Dependence on nature

Companies' underlying business models are often dependent on nature. Energy companies rely on the rainfall generated by tropical forests to power their dams. Pharmaceutical companies' innovations include discoveries from nature. Transportation infrastructure like the Panama Canal depends upon the precipitation that is stored in its forested watershed. High-integrity forests underpin the profits and losses of these companies. Companies that map their dependence on nature to specific places – based on their operational footprint or supply chain – may want to invest in credits from HFLD jurisdictions from these same jurisdictions as a critical part of their strategies.

Portfolio balancing and future-proofing

Companies using forest credits as a larger part of their overall credit portfolios (in addition to, for example, cookstove projects or engineered removals) may want to purchase credits from HFLD jurisdictions as part of a strategy to mitigate the risk of international leakage and support ongoing preservation of forests, as discussed in Section 2.

The process of decarbonizing economies may itself create new, additional pressures on forests. For example, in the past, targets to include biofuels in gasoline created additional demand for sugar crops and expanded agricultural areas. This accelerated deforestation in some places. Infrastructure and mining needs for establishing electric vehicle supply chains can also create pressures on forests. As another example, the larger projected role for biomass energy – burning wood pellets to generate electricity – could place additional pressure on forests.³³ To counterbalance these pressures, companies can directly invest in protecting forests in HFLD jurisdictions.

Reinforcing actions to decarbonize supply chains in specific jurisdictions

Companies pursuing decarbonization efforts within their value chains may make decisions that reduce revenues for commodity production in HFLD jurisdictions. To compensate for the impacts that

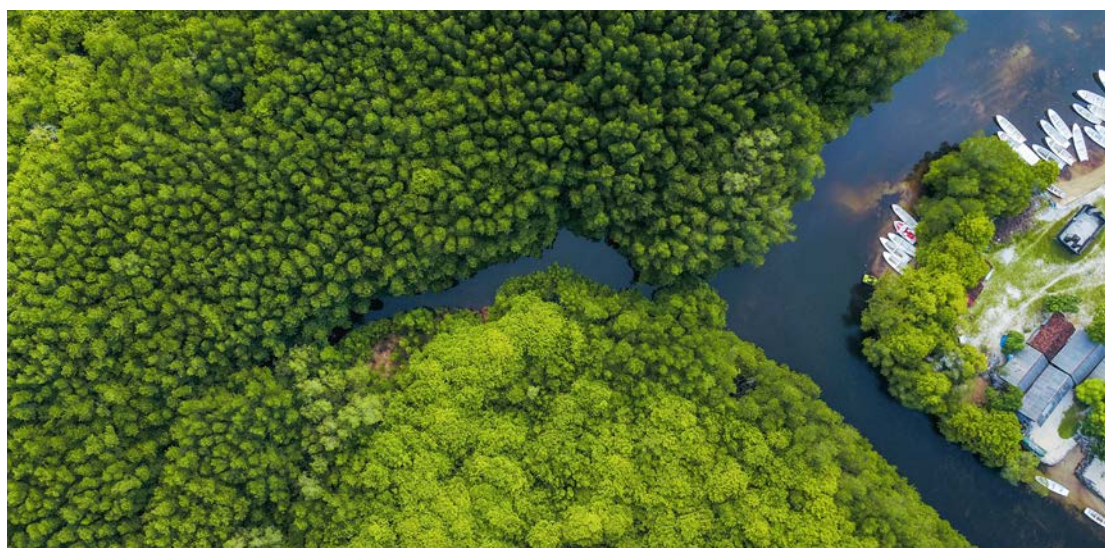
stakeholders may feel as a result, companies could use the purchase of credits from HFLD jurisdictions as a way to provide alternative finance to these areas. This can be part of their actions toward a just transition.

3.2 Beyond carbon: the many values of forest preservation in HFLD jurisdictions

Beyond their role in contributing to a climate mitigation portfolio, credits from HFLD jurisdictions can be a useful vehicle for delivering investments in support of other values.

For instance, the world's remaining highly intact forests are indispensable to maintaining global biodiversity and achieving sustainable development goals. They hold immense and unique value for the biosphere, while supporting important co-benefits and social, economic and environmental outcomes.³⁴ It is essential to maintain the ecological integrity of these important landscapes because they:

- Enhance resilience, by sustaining regional rainfall and reducing ecological vulnerability to fire, droughts, floods etc.
 - Conserve the biological diversity essential to maintaining ecological functions, adaptation and resilience.
 - Help secure the livelihoods, knowledge, and cultures of Indigenous Peoples and Local Communities (IPLCs). IPLCs are the inhabitants and stewards in well over 35% of the world's
- most intact forests, playing a central role in their conservation.³⁵ In major forest regions, it has been well established that forests under IP management and control are better protected than with other land classifications and uses.³⁶ Indigenous and local knowledge is also at the root of many Nature-Based Solutions and could also be a continued source of inspiration for their development and wider adoption.³⁷
 - Deliver cost-effective social benefits through ecosystem services such as functioning watersheds, food security and improved human health outcomes, including protection against future zoonosis outbreaks.³⁸ Declines in environmental integrity generally mean reduced suitability of habitat for native biota, disrupted ecological processes, diminished ecosystem resilience, diminished capacity to sustain species, and reduced provision of many ecosystem services, especially those that represent 'public goods'.^{39,40}



3.3 Attributes of robust HFLD crediting programs

Like all carbon credits, it is imperative that credits from HFLD jurisdictions be of high environmental and social integrity to attract the level of finance necessary for success in combating climate change.

The main characteristics that HFLD crediting programs and the credits from HFLD jurisdictions themselves should have are⁴¹:

- 1. Transparent program governance:** The GHG crediting program used to issue the credit must be managed by a government or non-profit organisation that clearly sets out the rules for governance of the program.
- 2. Program transparency and public participation provisions:** The GHG crediting program that issues the credits must have provisions for effective public stakeholder consultation related to implementing REDD+ activities and methodology/standard development.
- 3. Clear and transparent accounting standards and methodologies:** The GHG crediting program that issues the credits must publish accounting standards and methodologies that ensure that emission reductions and/or removals are real, additional, based on realistic and credible baselines, monitored, verified, addressing leakage and permanence, and avoiding double counting.
- 4. Environmental and social safeguards:** Activities resulting in credits from HFLD jurisdictions should apply rigorous environmental and social safeguards.
- 5. Robust verification:** The GHG crediting program used to issue the credit must publish requirements for independent third-party verification, including provisions to avoid conflicts of interest between the validation/verification body, the HFLD jurisdiction, and the GHG crediting program; requirements for conducting validations and/or verifications in line with auditing industry standards; and provisions for accreditation and oversight of validation/verification bodies.
- 6. Legal underpinning:** Ownership of or rights to the benefits of each credit from an HFLD jurisdiction should be described and verified.
- 7. Credit registry:** Credits should be tracked in a publicly available registry with the basic functionality to provide access to all underlying HFLD program information; transparently issue, retire, and cancel credits, including credits within a buffer pool account; and individually identify credits through unique serial numbers that contain sufficient information to avoid double issuance (type, geography, vintage).



3.4 A corporate call to action

Corporate leaders can and should make decisions today to include meaningful amounts of credits from HFLD jurisdictions in their carbon offset portfolios.

As a group of leading NGOs and recognised market facilitators, we have convened to build support for credits from HFLD jurisdictions and provide guidance to company leaders, sustainability portfolio managers and government buyers. We recognise the challenges faced by carbon credit buyers to manage decarbonization and procurement strategies within a continually evolving market and policy landscape. It is in this spirit that we have authored this paper – to provide relevant background on HFLD countries and credits as an emerging class of nature-based carbon credits and to address how these should be positioned within a high-ambition net zero strategy.

This paper articulates the case for corporate use of credits from HFLD jurisdictions as *part of a portfolio* of carbon credits. We now call upon corporate leaders to come forward in support of credits from HFLD jurisdictions and to take concrete actions outlined later in this section.

At UNFCCC COP26 in Glasgow last November, 141 countries pledged at the highest political level to stop deforestation by 2030.⁴² Meeting this target is necessary if the world is to remain within a 1.5 °C warming pathway, and this goal cannot be met without the continued contribution of forests from HFLD jurisdictions. Many HFLD jurisdictions will be forced to make difficult decisions about their economic development trajectories, and without meaningful alternative financial incentives, the trajectories that cause deforestation may become the most appealing options for the jurisdictions.

In parallel to the goals set by the Paris Agreement, the contribution of HFLD countries and jurisdictions and their intact forests is also pivotal for achieving what are known as “Nature-Positive targets”. Nature-Positive targets aim to halt and reverse nature loss, through increasing the health, abundance, diversity and resilience of species, populations, and ecosystems, so that by 2030 nature is visibly and measurably on the path of recovery. The vision is that by 2050, the recovery of nature will be self-sustaining, so that thriving ecosystems continue to support future generations, the diversity of life, and a stabilized climate.

The market entry of credits from HFLD jurisdictions comes at an inflection point in corporate climate ambition. At COP26, major agricultural companies committed to halt forest loss associated with agricultural commodity production and trade.⁴³ Additionally, more than 30 financial institutions - representing \$8.7 trillion in assets - committed to tackle agricultural commodity-driven deforestation by publicly disclosing risks, establishing policies to address deforestation, engaging with companies, and increasing investment in natural climate solutions.⁴⁴

Companies have available a range of tools to meet their sustainability strategies. Internal Decarbonization must come first, backed by ambitious science-aligned targets. However, companies must go beyond to counterbalance their emissions on the road to net zero. Credits from HFLD jurisdictions represent a credible and impactful pathway for implementing these pledges—and beyond—by safeguarding crucial ecosystems that are so indispensable for climate, biodiversity, ecosystem services, and the rights and wellbeing of Indigenous Peoples and local communities.

To achieve these goals, corporations should take several immediate actions:

1. Actively adopt and promote the role of HFLD crediting programs in engagements with stakeholders – especially forest governments and subnational jurisdictions charged with designing and implementing forest and land use policies.
2. Make tangible and measurable commitments to use credits from HFLD jurisdictions in their portfolio of climate mitigation investments, specifying the role they see these credits playing in their own mitigation strategy.
3. Make assessments of which HFLD jurisdictions to support. The organizations that are signatories to this paper can be resources to help companies think through these assessments according to their individual circumstances.
4. Buy credits from existing high-quality standards offering jurisdictional-scale HFLD crediting pathways when available.



The resurgent corporate interest in natural climate solutions represents a vital opportunity to stop and reverse deforestation. **Forests everywhere are under threat.** Success in stopping deforestation in one place will not stop it everywhere; long-term forest protection will require sustained finance from a range of sources. Corporate buyers of credits from HFLD jurisdictions can play an important role in making this happen. In support of the old adage that “an ounce of prevention is worth a pound of cure”, investing in HFLD areas can help mitigate ongoing

and future threats, prevent the displacement of deforestation, strengthen the ecological and economic resilience of forests, and support the livelihoods of forest stewards who have long been overlooked.

Together, we can make forests worth more alive than dead. To learn more about credits from HFLD jurisdictions, go to <https://preserveforests.org>; to discuss how your company can purchase credits from HFLD jurisdictions when available, contact contact.us@climateimpactx.com



**SUPPLEMENTARY
BACKGROUND:**

Carbon finance for
REDD+ and credits
from HFLD jurisdictions

Climate and forest finance

Climate finance for 2019/2020 reached USD 632 billion, of which USD 571 billion is for climate change mitigation. Of this, just USD 14 billion (about 2.4%) flowed to the land-use sector, including forests, agriculture and other land uses.⁴⁵ Climate finance, including results-based climate finance mechanisms such as the Green Climate Fund, is an umbrella category that includes carbon finance. Carbon finance is a more specific category that usually refers to market-based payments for carbon credits, including from forests. Of the USD 14 billion in climate finance going to the land-sector in 2019/2020, at least 3.4 billion helped to finance forestry projects – and some of this money flowed through carbon markets (though private sector finance flows are difficult to pinpoint).

Current carbon finance for forests is mainly geared towards Reducing Emissions from Deforestation and Degradation, or REDD+ under the United Nations Framework Convention on Climate Change (UNFCCC). REDD+ is designed to support countries' efforts to deliver climate mitigation through a collection of five activities: reducing 1) deforestation and 2) forest degradation, and fostering 3) conservation, 4) sustainable management of forests, and 5) enhancement of forest carbon stocks. The set of decisions related to REDD+ is known as the Warsaw Framework for REDD+ (WFR⁴⁶). The concept of REDD+ has also

been extended to subnational jurisdictions and carbon markets.

The first two activities of REDD+ are reducing emissions from deforestation and forest degradation. These are often considered to be the most urgent activities to tackle as they account for around 11% of global carbon dioxide emissions – in other words, they can be considered to be the “REDD+ emergency room” activities. Understandably, these two activities have received most of the forest-related climate finance until now.

But the concept of REDD+ treats the five activities as a coherent package, not a series of isolated approaches. In that regard, REDD+ aims to address the overall health and integrity of forests – much as a public health system aims to address all aspects of human health. In this analogy, reducing deforestation and forest degradation are the “triage” activities, but they are not sufficient on their own to address the overall health and integrity of forests. The other three activities are needed to provide for the preventative care and health of forests that are still needing care but not in an emergency situation. Therefore, these activities need finance, support, and capacity that reinforces and buttresses the work of the “triage” activities – but so far they have only received a very small portion of forest carbon finance.



Standards that include HFLD countries and jurisdictions



The Warsaw Framework established many of the norms around REDD+ but it was not designed to be a market mechanism and as such, it lacks many of the elements required by the voluntary and compliance carbon markets. New standards needed to be created to fill this gap. Currently there are two jurisdictional REDD+ standards that include HFLD crediting pathways for the voluntary carbon market:

1. The Architecture for REDD+ Transactions (ART) and its REDD+ Environmental Excellence Standard (TREES)⁴⁷,
2. The World Bank Forest Carbon Partnership Facility (FCPF) Carbon Fund⁴⁸ Methodological Framework,⁴⁹

Only ART's TREES was developed specifically to allow investors and the private sector to engage in carbon credit transactions. Over the next few years, companies will be able to buy credits from HFLD jurisdictions

through ART or when HFLD countries have surplus credits under FCPF. Additional high-quality pathways may open in the future.

The Green Climate Fund (GCF) REDD+ Results Based Payments Pilot Programme⁵⁰ also allowed for HFLD accounting, but these units were financed and retired by the GCF and not intended for the voluntary carbon market. The REDD.Plus platform, which allows for HFLD adjustments, is not considered a standard for REDD+ credits, as it is solely based on the Warsaw framework which was not designed to produce high-integrity credits ready for market. It does not require independent third-party validation and verification in line with auditing industry requirements as is standard for the carbon market, and is missing essential elements required of market ready REDD+ programs, including for example consistent methodologies, verified compliance with safeguards, compliance with all relevant laws and regulations, and established carbon rights.

References

1. IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)].
2. Trove Research, Future Size of the Voluntary Carbon Market, October 2021, available at: https://trove-research.com/wp-content/uploads/2021/11/Trove-Research_Scale-of-VCM_29-Oct-2020-2.pdf
3. Per World Bank. "Carbon crediting mechanism refers to a system where tradable credits (typically representing a metric ton of carbon dioxide equivalent) are generated through voluntarily implemented emission reduction or removal activities." <https://www.carbonpricingleadership.org/report-of-the-highlevel-commission-on-carbon-prices>
4. In this context fungibility means equivalence (and hence exchangeability on a 1:1 basis) with other categories of carbon mitigation units.
5. da Fonseca *et al.* (2007). No Forest Left Behind. *PLoS Biol* 5(8): e216. doi:10.1371/journal.pbio.0050216
6. In 2019, led by Suriname, the countries adopting the *Krutu of Paramaribo Joint Declaration on HFLD Climate Finance Mobilization* expressed their commitment to work together. The signatories are: Bahamas, Bhutan, Cameroon, Canada, Colombia, Republic of Congo, Costa Rica, Democratic Republic of Congo, Fiji, Finland, France on behalf of its highly forested department of French Guiana, Gabon, Ghana, Guyana, Malaysia, Nicaragua, Norway, Panama, Peru, Samoa, Sao Tome & Principe, Seychelles and Zambia. Available at: https://www4.unfccc.int/sites/SubmissionsStaging/Documents/201903220903--Krutu%20of%20Paramaribo_13-02-19.pdf
7. List of HFLD countries: Bhutan, **Central African Republic**, **Republic of Congo**, Costa Rica, Fiji, **Gabon**, Equatorial Guinea, **Guyana**, Jamaica, **Papua New Guinea**, Solomon Islands, Suriname. List of HFLD jurisdictions: Lunda Norte in Angola; Pando in Bolivia; Amapa and Amazonas in Brazil; Haut-Mbomou, Haute-Kotto, Mambere-Kadei, Mbomou, Ombella-M'Poko, Ouaka, and Ouham in Central African Republic; Amazonas, Guainia, Vaupes, and Choco in Colombia; Nariño in Ecuador; Ngounie, Ogooue-Ivindo, Ogooue-Lolo, Wouleu-Ntem in Gabon; Cuyuni-Mazaruni, East Berbice-Corentyne, and Upper Takutu-Upper Essequibo in Guyana; Papua Barat and Papua in Indonesia; Central, East Sepik, Gulf, Morobe, and Sandaun in Papua New Guinea; Amazonas, Loreto, and Madre de Dios in Peru; Cuvette and Likouala in Republic of Congo; West Equatoria in South Sudan; Amazonas, Bolivar, and Delta Amacuro in Venezuela. Countries in **bold** are both HFLD countries and have HFLD subnational jurisdictions.
8. Potapov, P. *et al.* (2017) The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. *Science Advances* 2017;3: e1600821, data updates to 2020 available [here](#).
9. Potapov, P. *et al.* (2017) The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. *Science Advances* 2017;3: e1600821, data updates to 2020 available [here](#).
10. Goldstein *et al.* (2021) Protecting irrecoverable carbon in Earth's ecosystems. *Nature Climate Change* 10:287–295 <https://doi.org/10.1038/s41558-020-0738-8>
11. Friedlingstein *et al.* (2021) Global Carbon Budget 2021. *Earth Syst. Sci. Data*. 14:1917–2005 <https://doi.org/10.5194/essd-14-1917-2022>; Hubau *et al.* (2020) Asynchronous carbon sink saturation in African and Amazonian tropical forests. *Nature* 579:80–87 <https://doi.org/10.1038/s41586-020-2035-0>; Harris *et al.* (2021) Global maps of twenty-first century forest carbon fluxes. *Nat. Clim. Chang.* 11: 234–240 <https://doi.org/10.1038/s41558-020-00976-6>
12. See Baccini *et al.* (2017) Tropical forests are a net carbon source based on aboveground measurements of gain and loss. *Science* DOI: [10.1126/science.aam59](https://doi.org/10.1126/science.aam59)
13. EPA Greenhouse gas equivalencies calculator. Available at: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>
14. Lawrence *et al.* (2022) The Unseen Effects of Deforestation: Biophysical Effects on Climate. *Front. For. Glob. Change* 5:756115. doi: 10.3389/ffgc.2022.756115, <https://www.frontiersin.org/articles/10.3389/ffgc.2022.756115/full>; Seymour, M, Wolosin, M and Gray, E (2022) Not Just Carbon Capturing All the Benefits of Forests for Stabilizing the Climate from Local to Global Scales. <https://www.wri.org/research/not-just-carbon-capturing-benefits-forests-climate>
15. Rockström *et al.* (2021) Opinion: We need biosphere stewardship that protects carbon sinks and builds resilience. *PNAS* <https://doi.org/10.1073/pnas.2115218118>; Lawrence *et al.* (2022) The Unseen Effects of Deforestation: Biophysical Effects on Climate. *Front. For. Glob. Change* 5:756115. doi: 10.3389/ffgc.2022.756115 <https://www.frontiersin.org/articles/10.3389/ffgc.2022.756115/full>
16. Rockström *et al.* (2021) Opinion: We need biosphere stewardship that protects carbon sinks and builds resilience. *PNAS* <https://doi.org/10.1073/pnas.2115218118>

References

17. Maxwell *et al.* (2019) Degradation and forgone removals increase the carbon impact of intact forest loss by 626%. *Science Advances* 2019;5:eaax2546
18. For a comparative assessment of sources of finance for stable areas of forests, see Table 3 in Funk *et al.* 2019. Securing the climate benefits of stable forests. *Climate Policy* 19(7): 845-860.
19. Harris *et al.* (2021) Global maps of twenty-first century forest carbon fluxes. *Nat. Clim. Chang.* 11:234–240 <https://doi.org/10.1038/s41558-020-00976-6>
20. Potapov, P. *et al.* (2017) The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. *Science Advances.* 2017;3: e1600821, data updates to 2020 available [here](https://doi.org/10.1126/science.1250013).
21. See 'Options for Conserving Stable Forests' by Simon and colleagues (2021), World Bank Group, applying the de Fonseca *et al.* approach and using data from the Food and Agriculture Organization's (FAO) statistical database (FAOSTAT) updated with the latest 2020 Forest Resources Assessment (FRA). <https://documents.worldbank.org/curated/en/541251635971110855/Options-for-Conserving-Stable-Forests>
22. da Fonseca *et al.* (2007). No Forest Left Behind. *PLoS Biol* 5(8): e216. doi:10.1371/journal.pbio.0050216
23. World Bank Group. "Options for Conserving Stable Forests." 2021. Available at: <https://documents1.worldbank.org/curated/en/541251635971110855/pdf/Options-for-Conserving-Stable-Forests.pdf>
24. Global Forest Watch Profile, Colombia. Accessed September 2022. Available at: <https://www.globalforestwatch.org/dashboards/country/COL>
25. Environmental Investigation Agency. "Tainted Beef: How criminal cattle supply chains are destroying the Colombian Amazon." 2021. Available at: https://content.eia-global.org/assets/2021/05/Tainted_Beef-EIA.pdf
26. Morton *et al.* 2006. Cropland expansion changes deforestation dynamics in the southern Brazilian Amazon. *PNAS* 103(39): 14637-14641. <https://doi.org/10.1073/pnas.0606377103>
27. Dezécache *et al.* 2017. Gold-rush in a forested El Dorado: deforestation leakages and the need for regional cooperation. *Env Res Letters* 12: 034013; Espejo *et al.* 2018. Deforestation and forest degradation due to gold mining in the Peruvian Amazon: a 34-year perspective. *Remote Sensing* 10: 1903. doi:10.3390/rs10121903
28. Heilmayr *et al.* 2020. Deforestation spillovers from oil palm sustainability certification. *Env Res Letters* 15: 075002; Taheripour *et al.* 2019. Market-mediated responses confound policies to limit deforestation from oil palm expansion in Malaysia and Indonesia. *PNAS* 116(38): 19193-19199; Vijay *et al.* 2018. Deforestation risks posed by oil palm expansion in the Peruvian Amazon. *Env Res Letters* 13: 114010; Qaim *et al.* 2020. Environmental, economic, and social consequences of the oil palm boom. *Annu. Rev. Resour. Econ.* 2020. 12:321–44.
29. FAO and FILAC. 2021. Forest Governance by Indigenous and Tribal People. An Opportunity for Climate Action in Latin America and the Caribbean. Santiago. <https://doi.org/10.4060/cb2953en>
30. Jayathilake HM, Prescott GW, Carrasco LR, Rao M, Symes WS. Drivers of deforestation and degradation for 28 tropical conservation landscapes. *Ambio.* 2021 Jan;50(1):215-228. doi: 10.1007/s13280-020-01325-9.
31. Science Based Targets Initiative, Beyond value chain mitigation FAQ. Available at: <https://sciencebasedtargets.org/resources/files/Beyond-Value-Chain-Mitigation-FAQ.pdf>
32. For example, using committing to set a target using guidance from the Science Based Targets Initiative (SBTI) Available at: <https://sciencebasedtargets.org/>
33. Funk *et al.* (2022). Assessing the potential for unaccounted emissions from bioenergy and the implications for forests: The United States and global. *Global Change Biology - Bioenergy*, 14: 322-345. Available at: <https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/gcbb.12912>
34. Reviewed in detail by Watson, J. E. M., *et al.* (2018) The exceptional value of intact forest ecosystems. *Nature Ecology and Evolution* 2: 599-610.
35. Fa *et al.* (2020) Importance of Indigenous Peoples' lands for the conservation of Intact Forest Landscapes. *Frontiers in Ecology & Environment* doi:10.1002/fee.2148
36. FAO and FILAC. 2021. Forest Governance by Indigenous and Tribal People. An Opportunity for Climate Action in Latin America and the Caribbean. Santiago. <https://doi.org/10.4060/cb2953en>
37. See "Avoiding a new era in biopiracy: Including indigenous and local knowledge in nature-based solutions to climate change" by Cottrell (2022) *Environmental Science & Policy*. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S1462901122001630>
38. See "Ecology and economics for pandemic prevention" (2020) by Dobson and colleagues. *Science*. Available at: <https://www.science.org/doi/full/10.1126/science.abc3189>

References

39. See "Emerging threats linking tropical deforestation and the COVID-19 pandemic" (2020) by Brancalion and colleagues, *Perspectives in Ecology and Conservation*. Available at: <https://www.sciencedirect.com/science/article/pii/S2530064420300584>
40. See "Editorial: Intact Forests" by Evans and colleagues (2021) *Frontiers in Forests and Global Change*. Available at: <https://www.frontiersin.org/articles/10.3389/ffgc.2021.753786/full>
41. See World Economic Forum and World Business Council on Sustainable Development, "Natural Climate Solutions for Corporates." July 2021. Available at: https://www3.weforum.org/docs/WEF_NCSA_NCS_for_Corporates_2021.pdf
42. Glasgow Leaders' Declaration on Forests and Land Use, <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>. See also announcement of Forest Climate Leaders Partnership, <https://ukcop26.org/leaders-will-build-on-glasgow-legacy-to-establish-forests-climate-leaders-partnership-at-cop27/>
43. Agricultural Commodity Companies Corporate Statement Of Purpose, <https://ukcop26.org/agricultural-commodity-companies-corporate-statement-of-purpose/>
44. Financial Sector Commitment Letter On Eliminating Commodity-Driven Deforestation, <https://racezero.unfccc.int/wp-content/uploads/2021/11/DFE-Commitment-Letter-.pdf>
45. See 'Global Landscape of Climate Finance 2021' by Buchner and colleagues (2021) published by the Climate Policy Initiative. <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2021/>
46. Available at: <https://unfccc.int/topics/land-use/resources/warsaw-framework-for-redd-plus>
47. Available at: <https://www.artredd.org/trees/>
48. Available at: <https://www.forestcarbonpartnership.org/carbon-fund>
49. Available at: https://www.forestcarbonpartnership.org/system/files/documents/fcpf_carbon_fund_methodological_framework_revised_2020_final_posted.pdf
50. Available at: <https://www.greenclimate.fund/redd#redd-results-based-payments-pilot>

Preserving Forests in High Forest, Low Deforestation Jurisdictions



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