5.3 Addressing risks in REDD+ through carbon payments and buffering rates

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Introduction

The latest reports from the Intergovernmental Panel on Climate Change confirm that since 1750, CO_2 emissions from deforestation and other land-use changes are estimated to be roughly one-third of total anthropogenic emissions. Climate models remain inconclusive on whether carbon will continue to accumulate in natural terrestrial ecosystems, or whether ecosystems will become a net source, due to the combined effects of climate and land-use change over the course of this century.

FLEGT is emerging as an effective way to reduce risk and provide non-carbon benefits

In order to fight land degradation, biodiversity decline and climate change, millions of hectares of forest landscapes would need to be restored.[1] The largest and most ambitious international catalyst of such efforts is REDD+, whereby developing countries receive results-based payments (RBPs) for verified emission reductions[2] from forests under the guidance of the UNFCCC.

This article aims to demonstrate that RBPs with comprehensive risk reduction strategies can help incentivize both sustainable mitigation and non-carbon benefits (NCBs).

Trees planted to reduce emissions will reach maturity in a different world (World Bank 2012). By 2050, mean temperatures and precipitation will have changed substantially, and forests and agriculture will need to produce more than 60% more calories for human consumption globally (Wheeler and von Braun 2013), more than 200% more in Africa, with less fossil fuels, fewer energy-intensive chemicals and more frequent climate extremes, especially in the tropics (Coumou and Robinson 2013). The IPCC lists forests and agriculture among the sectors that would feel the greatest impact from climate extremes (IPCC 2012).

In November 2013, Parties to the UNFCCC therefore recognized the importance of incentivizing NCBs such as poverty alleviation and biodiversity benefits, ecosystem resilience and the linkages between adaptation and mitigation for the long-term sustainability of REDD+, beyond RBPs.

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The Carbon Fund of the Forest Carbon Partnership Facility (FCPF)[3] is the lead multilateral initiative for piloting large-scale demonstration activities and RBPs for REDD+. Between 2015 and 2020 its Methodological Framework and Pricing Approach (MFPA) will form the conceptual basis for five emission-reduction programmes (ERPs) and a blueprint for national implementation of REDD+. The draft MFPA acknowledges the need to minimize and prevent risks, and to address the long-term sustainability of ERPs.

- At the international level, RBPs have to rely on simple and comparable performance indicators so that scarce climate financing can be allotted to the best performing REDD+ programmes. Forest carbon (i.e., removals or avoided emissions, calculated in tCO2/year), is an appealing yardstick to allocate positive incentives (i.e., RBPs) among developing countries, based on concrete climate achievements. If a country has the capacity to make, detect and report meaningful changes in forest emissions, it would be paid ex-post — i.e., at the end of multi-year "crediting periods"[4] — after these changes are verified.
- At the national level, however, policy approaches would have to anticipate, frame and complement RBPs. Incentives alone are unlikely to modify underlying economics or compete with foregone revenues from more profitable, yet unsustainable, land activities. Parrotta, Wildburger and Mansourian (2012) stress that poorly designed and implemented REDD+ policy approaches can have serious adverse impacts on biodiversity and forest-dependent peoples. This compromises the biological and socio-economic resilience of rural landscapes, and the REDD+ goal of halting and reversing CO_2 emissions in the long term.

Remaining gaps in REDD+ rules

Within current REDD+ rules, there are ways by which a country could arguably claim RBPs while minimally respecting safeguards, and providing few if any NCBs:

- providing only basic forest data;
- fencing protected forests;
- planting large areas with fast-growing mono-specific trees;
- running expeditious consultations; and
- disregarding the possible displacement of land activities (agriculture, roads, etc).

Most REDD+ countries aspire to a better REDD+. It is in their self-interest (NCBs are by definition positive outcomes of REDD+), and it makes REDD+ more legitimate in the eyes of the general public, companies and forest users. This enhances REDD+ credibility globally and the prospect of sustained RBPs in several ways:

- increasing trust and transparency: providing accurate, spatially explicit and comparable information on forests and agriculture, including land tenure and land planning in reference levels, measurement, reporting and verification of results;
- preventing reversals: promoting agroforestry and community-based forestry, fire prevention (prescribed burning, fire breaks), protecting soils, water catchments, biodiversity hot spots and traditional forest knowledge, reviving sustainable agriculture in degraded areas, and maximizing the diversity of tree species and stand structures to increase forest resilience and enduring ecosystem services; and

- preventing leakage: decoupling rural development (poverty alleviation, food and energy security) from environmental degradation, promoting fair trade, sustainable production and consumption patterns, and fostering regional cooperation and equitable sharing of benefits.

The gap between "minimal" REDD+ and "ideal" REDD+ is sobering. Failing to address this gap (when setting the basic principles of incentives that could shape tropical forest management for 20 to 40 years) would amount to dire negligence. Even from a narrow mitigation perspective the risks of climate change causing forest die-back (releasing even more CO_2) underscores the importance of resilient REDD+ strategies. Such negative carbon feedbacks would indeed be one of the most obvious tipping points in climate change (Barnosky et al. 2012).

There are opportunities to encourage improvements. Clarifying equitable land tenure, for example, is in itself a crucial yet challenging NCB. Reinforcing tenure rights to land and resources will provide a strong incentive for stakeholders to participate in REDD+ in the long term, thus preventing reversals.[5] Similarly, increasing the sustainable yields of resilient crops within REDD+ intervention areas would reduce the risk of leakage. Granted, some NCBs may not necessarily reduce the risks, and those risks might also be mitigated without delivering NCBs. Overall, however, there is an excellent match between policies and measures that reduce risks and those that promote NCBs (Table 1).

Risk factors

We are still limited in our capacity to monitor and forecast the changes that forest carbon cycles undergo at local and global levels. In order to maintain environmental integrity, the Methodological Framework requires a share of primary emission reductions (pERs)[6] to be set aside as the default response to key risks. For example, 10 to 40% could be buffered against reversals, up to 15% for data uncertainty and more for the possible inability of ERP to transfer uncontested ER titles. RBPs would be disbursed only on the basis of remaining, creditable ER (cER); the rest of pER would otherwise be either retired (cancelled) or buffered (bER, see below). Other accounting aspects could also be factored in as appropriate (e.g., through a leakage buffer or a conservation buffer to encourage the participation of least developed and/or forest-rich countries). Let 1-(cER/pER) be the Composite Risk Factor (CRF) for a given ERP over a given time period, i.e., the share of pER that would not be credited.

Table 1. Likely convergence between NCBs and risk prevention policies and measures

Policies that promote non-carbon benefits	Risk reduction
Promoting adaptive forest management; i.e., diversity in landscapes, tree species, and stand structures, fire prevention	▪ provides a range of alternative livelihood strategies, increases climate resilience and the provision of ecosystem services ▪ limits the risk of natural die-back and disasters › **lowers the risk of reversal**
Promoting transparent and participatory governance	▪ increases project ownership and alignment with the cultural, social and economic priorities of forest users ▪ limits the risk that the programme will be abandoned › **lowers the risk of reversal**
Providing spatially explicit information, reconciling land-use maps between various ministries, such as agriculture, mining, transports, energy and environment/forest	▪ clarifies tenure and rights, prevents land-use conflicts, facilitates benefit sharing and land-use planning ▪ avoids overstating the emissions baseline (Forest (Emissions) Reference Level, FRL) and maintains long-term participation in REDD+, reduces inconsistencies between national GHG inventories and REDD+ reporting › **lowers risks related to institutions, reversal and leakage**
Developing climate-smart agriculture, short-rotation plantations for fuelwood and agro-forestry, promoting fair trade of legal/sustainable commodities	▪ improves food/energy security, addresses possible trade-offs between adaptation and mitigation, increases revenues › **lowers risks related to reversal and leakage**
Reporting on improved social benefits (rights, healthcare, training, extension services) as a result of transparent and fair benefit sharing, as provided in the REDD+ strategy	▪ increases transparency and prevents risks of corruption, double counting or manipulations of reporting › **lowers risks related to institutions and leakage**
Identifying and restoring degraded forest landscapes, with a view to enhancing ecosystem services	▪ improves monitoring capacities to estimate impacts on natural forests, degradation and restoration through appropriate proxies or higher IPCC Tiers[7] › **lowers risks of falsifying, skewing or selectively omitting monitoring data**

Source: Adapted from Dutschke, M. 2013. Key issues in REDD+ verification. Study commissioned by CIFOR. Occasional Paper 88.

Risk factors and their relationship to FLEGT

As part of its Forest Law Enforcement Governance and Trade (FLEGT) Action Plan to address illegal logging, the EU uses a legality matrix in Voluntary Partnership Agreements to relate principles and criteria for legality standards against relevant pieces of national legislation in host countries. This fosters a country-owned process to put in place or revise legislation and institutions that are lacking or ineffective. The objective is to foster permanent, legally binding, country-specific improvements in governance and legal frameworks while strengthening participatory governance and national sovereignty. Since 2005 the World Bank has also authorized the use of "country systems" (i.e., national laws and institutions), instead of scrutinizing the full suite of its own safeguard policies (CIEL 2008). The voluntary carbon standard has also identified factors and remedies to estimate[8] the risks of reversal or leakage within jurisdictional programs.

With REDD+, delivery partners (e.g., World Bank, Green Climate Fund), markets and regulators, public and private banks, land-related investors, and NGOs apply various criteria and indicators when they select programmes/projects, design loans, monitor implementation, set a price for ERs or limit market access (whether for carbon or commodities). In order to avoid a proliferation of competing standards and opaque, burdensome reporting procedures REDD+ risk assessments could build on the approaches outlined above by summarizing the sustainability level for each ERP country or province in its CRF.

The CRF could be assessed and updated by an independent panel before each crediting period, based on peer review among fund/UN participants and on information already reported by the country as part of its mandatory REDD+ framework.[9] This could accommodate a diversity of country situations and strategies; the risk assessment would first and foremost be based on concrete, nationally/locally appropriate policy milestones. The country would therefore define (and get external feedback and support for) its national approach to resilient, low-emissions rural development:

- the country would define and prioritize legal and institutional milestones;
- the panel would assess the risk factors associated with reaching or missing these milestones;
- taking these steps and meeting these milestones would result in higher proportions of creditable ER under REDD+, in effect quantifying the carbon (and RBPs) potential of policy processes, such as FLEGT; and
- the country could then make an informed decision on whether reaching the milestone was worth the effort in terms of resources and political capital.

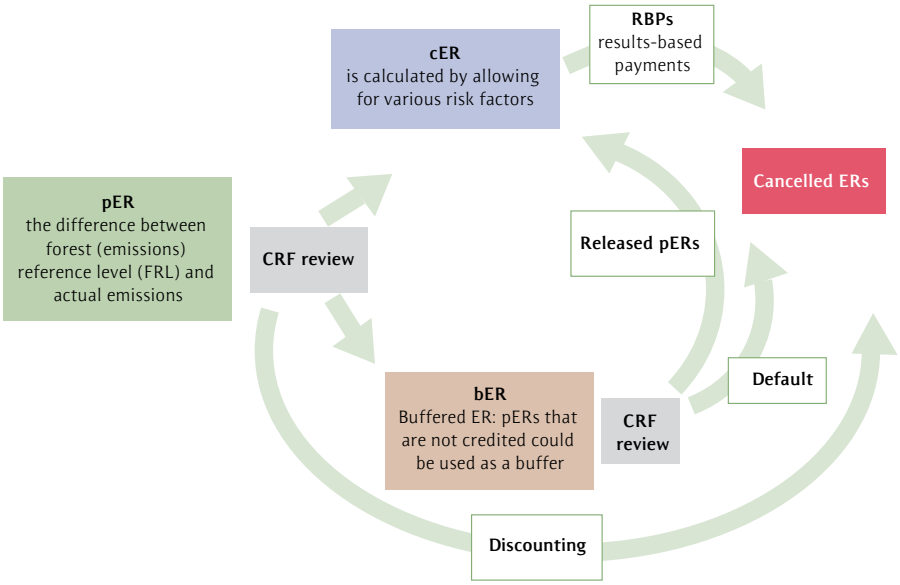
In addition, reaching the milestone and having it recognized by the panel would also send a signal to public and private investors. Interested banks and companies would get evidence that land investments in that ERP are safer, i.e., not only less emissive but also less likely to lead to leakage, reversal or policy problems, compared to other areas. This would also make products and company sourcing from that region more attractive to consumers, citizens and public and private investors, who are increasingly aware of sustainability issues in land management.

Buffers and withholding/release rates

Some or all of the pERs that are not credited could accumulate in a reserve carbon account as a buffer (bER; Figure 1). The bERs would have to be stored until they were either deducted from the buffer pool in subsequent crediting periods or released:

- if a country experienced a catastrophic fire season, it could use its national buffer to compensate for emissions (default in permanence) for the sake of environmental integrity;
- a major flaw in a country's carbon accounting system could justify the need for a downward adjustment of previously issued cER by neutralizing an equivalent amount of bER from its buffer (previously paid cER would therefore not be affected);
- deforestation could increase significantly in neighbouring countries/provinces, suggesting leakage. The countries/provinces involved could (on a voluntary basis) decide to pool their buffers to share the risks;
- if no risks materialize the country could capitalize on its buffer — for example, buffered bER could become creditable (cER) after two subsequent crediting periods if the above conditions were not triggered; or
- the country could also propose to cancel part of its own buffer in case of, or to contribute to, more ambitious global climate mitigation targets.

Figure 1. Emission reductions, buffers and results-based payments



The buffer is therefore equivalent to a comprehensive risk insurance system. Those countries with the highest CRF should contribute the most (which discourages free riders), but could receive payouts if the insurance was not triggered. By pooling and spreading different types of risk, the CRF leads to relatively high buffering rates, which allows less conservative buffering rates to be used for the various categories of risks. One negative

aspect is that cumulative discounts on pER seem at first sight to reduce credited volumes of ER, which would therefore reduce cash-flow incentives for ERP. The underlying hypothesis — that RBPs would be made on a fixed price basis (e.g., US$5/tCO2), irrespective of supply levels — may be to blame.

Less (ER) could mean more (money)

In reality, the global amount of money available in a fund to buy REDD+ cER, or the volume of REDD+ cER that could be bought on markets, will always be limited over a given Crediting Period (CP). In the case of the Carbon Fund, it is assumed the fund would buy $US150 million of cER at the end of CP1 (2015–17; Table 2) and US$150 million of cER at the end of CP2 (2018–20; Table 3).

The price of cER should depend on the amount of cER available for sale from all ERP before a cut-off date. If very few cERs were generated, the value per unit should increase to cover costs. If greater volumes of cER were generated, the value would decrease, consistent with the availability of funds. Achieving the EU goal of a 50% reduction in emissions from global deforestation and degradation by 2020 would thus require a total global REDD+ abatement (total pER; see Kanak and Henderson 2012) much greater than what could realistically be absorbed by carbon funds or markets by this date (total cER).

In other words, organizing scarcity (cER/pER), through higher CRF and lower creditable volumes, would contribute to maintaining price level and participation. Early movers could still capitalize on their bER in subsequent CPs, which means that all pER could ultimately be recognized, while improving the stability and predictability of REDD+ revenues for the countries involved.

Table 2. Baseline: results-based payments for three ERPs, in CP1 (2015–17)

ERP	pER in CP1 (in MtCO2)	X carbon price in CP1	= RBPs 2017 (million US$)
Country A	10	US$150 million/ 30 MtCO2 = US$5/tCO2	50
Country B	15		75
Country C	5		25
Total	30		150

Note: without discount/buffering factors; creditable ER=primary ER.

Table 3. Baseline: results-based payments for three ERPs, in CP2 (2018–20)

ERP	pER in CP2 (in MtCO2)	X carbon price in CP2	= RBPs 2020 (million US$)
Country A	15	US$130 million*/ 23 MtCO2 = US$5.6/tCO2	15 X 5.6=84
Country B	–3*		0
Country C	8		8 X 5.6=45
Total	20		130*

Note: without discount/buffering factors; creditable ER=primary ER. *The reversal of ERP B would require the fund to restore environmental integrity by somehow compensating 3 MtCO2 of previously issued cERs, thus reducing the money available for RBPs to ERP A and C.

Applying CRF and buffering to three virtual REDD+ countries over crediting period 1 (Table 4) would modify the distribution of RBPs between countries:

- Countries A and C receive more RBPs than in the baseline case (despite a 40% CRF);
- Country B gets fewer RBPs, but builds up a larger buffer, which means its cER could arguably have the same market value, despite higher perceived risks.

Table 4. Results-based payments for three ERPs, CP1 with CRF and buffer

	pER in CP1 (in MtCO2)	CRF (%)	cER =pER x (1-CRF) (in MtCO2)	X carbon price in CP1	= RBPs 2017 (cER price) (million US$)	bER in CP1 = pER-cER = pER*CRF (in MtCO2)
Country A	10	40	6	US$150 million/ 15 MtCO2 = US$10/tCO2	60	4
Country B	15	60	6		60	9
Country C	5	40	3		30	2
Total	30		15		150	15

Note: crediting period 1 (CP1: 2015–17) with discount/buffering factors, i.e., cER=pER x (100% minus CRF).

In CP 2, (comparing Tables 3 and 5), RBPs are roughly similar to what would have happened without buffering with these exceptions:

- A is rewarded for having increased its pER by 50 percent (from 10 to 15);
- C is rewarded for having increased its pER by 60 percent (from 5 to 8) and reduced risks (from 40 to 25 percent); and
- B has not received RBPs in CP2, but the fund has also not suffered liabilities. B can quit the system and make use of its 6 MtCO2 buffer as it sees fit, or can continue and improve in subsequent crediting schemes.

Table 5. Results-based payments (RBPs) for three ERP, CP2 with CRF and buffer

	pER in CP2 (in MtCO2)	CRF (%)	cER =pER x (1-CRF) (in MtCO2)	X carbon price in CP2	= RBPs 2020 (cER*price) million US$	bER in CP2 = bER in CP1 + pER CRF in CP2 (in MtCO2)
Country A	15	40	9	US$150 million/ 15 MtCO2 = US$10/tCO2	90	4+6=10
Country B	–3	60	0		0	9–3=6
Country C	8	25	6		60	2+2=4
Total	20		15		150	20

Note: crediting period 2 (CP2: 2018–20), with discount/buffering factors, i.e., cER=pER x (100% minus CRF).

Several results are apparent over Crediting Period 1 and 2:

- of the 50 MtCO2 of total pER, only 30 have been credited at $10/tCO2, with CRF, whereas 50 MtCO2 of cheaper yet unreliable pER would have been sold without CRF, for the same total amount of money (but not per tCO2);
- no price premium has been paid on the basis of NCBs, but they have been strongly incentivized nonetheless (C receives more RBPs in CP2, thanks to improving its CRF); and
- the 20 MtCO2 in buffers create a strong financial incentive for further improvements, since bER could be released at a later stage.

Conclusions

The CRF/buffer approach addresses three core difficulties of REDD+:

- establishing the right price for forest carbon given limited climate financing and lingering doubts about the sustainability of REDD+ ERP;
- addressing risks and building trust without hindering RBPs; and
- incentivizing the provision of NCBs, without dedicated price premiums.

The approach would require limited guidance from UNFCCC on risk assessment procedures and default risk factors to ensure that conditions are fair (similar to that needed for assessing FRL or MRV). REDD+ buyers and sellers may be tempted to underestimate risks in order to generate larger amounts of cheaper REDD+ credits, while environmental NGOs may conservatively overestimate buffering rates. No one can tell how much is enough until a buffer fails (i.e., if reversal, leakage or wrong data cannot be compensated). However, the principle does not depend on the actual risk factors. If 15 years down the line the international community realizes that buffers are too large or too small, the CRF could still be adjusted. The important difference is that REDD+ would have improved not only the present net uptake of CO_2 in forests, but more importantly the longevity of their accumulated carbon stocks (Mackey et al. 2013).

For the purpose of Tables 2, 3 and 4, the total amount of money available for REDD+ cER was deemed to be constant. In reality, the total amount of financing would depend on public, policy and market perceptions of REDD+, which are influenced precisely by how well risks and NCBs have been addressed. In other words, demonstrable improvements in addressing CRF do more than increase the relative amount of creditable emissions in a given country. They might also increase the total amount of money available for agriculture and forests in the future.

FLEGT, participatory forest governance, agro-ecology, integrated landscape management and improved forest information are emerging as effective ways to reduce risk and provide NCBs. They also contribute to protecting/restoring forest carbon and to its climate-proofing. Reciprocally, if the UNFCCC recognized these experiences in terms of quantitative risk reductions (and additional cER), it would send a clear signal to other public and private funders about where it is safest or most profitable/effective to invest, e.g., on legal timber and deforestation-free commodities such as palm oil, soy and minerals. This creates significant co-financing opportunities for REDD+ that include greening the supply chains of agro-business and retail companies.

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Endnotes

1. Global Partnership for Forest and Landscape Restoration. S. Minnemeyer, L. Laestadius and N. Sizer (World Resources Institute), C. Saint-Laurent (IUCN), and P. Potapov (South Dakota State University); 2011 in "A World of Opportunity." This brochure for the German Ministry for the Environment, Nature Conservation and Nuclear Safety builds on work supported by Profor and the Forestry Commission of Great Britain.
2. Emission Reductions are expressed in tCO2e/y. This article distinguishes primary emission reductions (pER; see Note 5); creditable ER (cER), which could be eligible for RBPs; and buffered ER (bER), which at a later stage could either be cancelled in case of default or released in absence of default (e.g., after two default-free crediting periods).
3. See www.forestcarbonpartnership.org (20 December 2013 version of MF).
4. The Crediting Period is the time in which forest emissions would be compared to a given reference level, at the end of which any emission reductions would be reported and verified and the Forest Reference Level (FRL) adjusted.
5. A reversal occurs when credited ERs are emitted in a later time period; i.e., when an ERP generates more emissions than its FRL over the course of a crediting period.

6. pER equals the difference between emissions in a forest reference level (FRL) and actual emissions as measured, reported and verified (MRV).
7. The 2006 IPCC guidelines include the ability to specify a "tier" to rate the reliability and methodological complexity of emission factors and activity data (http://community.foundationfootprint.com/FoundationFootprintHelpCentre/Miscellaneous/IPCCTiers.aspx).
8. See draft tools for the estimation of jurisdictional reversal/displacement in VCS JNR programmes at www.v-c-s.org.
9. This includes the National REDD+ Strategy, FRL, MRV and the information system on safeguards.

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