Moving Ahead with REDD

Issues, Options and Implications

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Chapter 8

How do we ensure permanence and assign liability?

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8.1 Introduction

One of the major concerns in the reducing emissions from deforestation and forest degradation (REDD) debate is the permanence of emissions reductions. How can we make sure that a forest area saved today will not be destroyed tomorrow? Who should be held liable if that happened? How can REDD contracts and financial mechanisms be designed to ensure permanence?

Compared with other climate change mitigation options, forestry is often considered special in two ways. First, it is more difficult to control the carbon storage. Even under the best management practices, an unexpected carbon release cannot be excluded. Droughts, pest, or fire have the potential to revert yearlong carbon uptake within weeks or months (Schlamadinger *et al.* 2007). Second, the climate effect of a forest mitigation activity is linked to the continued existence of trees on the area once verified. An effective REDD mechanism must provide continuous incentives for landowners to monitor and maintain their forestlands.

There are at least three counter-arguments against a categorical distinction between reduction of fossil emissions and carbon management in terrestrial systems: First, given the finiteness of fossil fuels, it is likely that they will anyway end up in the atmosphere over the long run. Reduced fossil fuel use today preserves a part of the reservoirs of coal, oil and gas, and carries the risk of higher production and consumption of the share in preserved today in the future. The question of permanence is therefore not limited to REDD.

Second, even if terrestrial carbon sequestration was in fact temporary, it will still have a positive climate effect (see the 'ton-year approach' discussed below). Related to that, REDD can produce large emissions reduction quickly, buying time for technological development and be a 'wooden bridge to a clean energy future' (Lecocq and Chomitz 2001). Without mitigation from forestry, the world is unlikely to get the quick emissions reductions needed to reach the maximum 2 degree Celsius target (e.g. Stern 2007).

Third, in most of today's developed countries, deforestation was a phase of development. Forest transitions tend to occur in phases: from slow to rapid deforestation to a phase of stabilisation and a later transition to a slow increase in forest cover (Rudel *et al*. 2005). Successful REDD will preserve forests during this risky development phase, and much of it will turn out to be permanent (Chomitz *et al*. 2006).

Still and although not uniquely confined to REDD, permanence is a real issue that will have to be taken into account in the REDD negotiations. Once someone assumes liability for terrestrial carbon stocks, non-permanence may still be a threat, but its damaging effects to the atmosphere are being compensated for. This may be the case in the future, if developing countries assume proper emissions targets, for example, within a cap and trade (CAT) system (Eliasch 2008). Before this happens, we need to find intermediate solutions. This chapter looks at different permanence risks and how these can be managed, and provides a toolbox of different liability mechanisms needed for achieving fungibility of carbon credits from land use and other sectors.

8.2 Permanence risks and how to manage them

There are a number of direct risks that can jeopardise the permanence of the emissions reductions achieved. One layer of risk management is how the risk of re-emission can be managed by projects or countries. A second risk management layer is needed, however, if REDD mechanisms are to be credited and used for compliance in voluntary or formal (compliance or offset) greenhouse gas (GHG) markets. In this case, some system of commercial liability must be

in place. Both layers are necessarily overlapping. The main distinction is that permanence risks need to be managed anyway, independently from whether emissions reduction credits are being generated, while the second layer is a commercial necessity in case REDD credits are to be traded.

8.2.1 Risks and risk management

What are the risks that can jeopardise the permanence of carbon stored in forests? We distinguish between the following types of risk (Wong and Dutschke 2003):

1. **Natural/ecological risk:** Erratic variations in carbon stocks, caused by natural events such as storm, drought, pests, or fire.
2. **Climate change-related risk:** Climate change may lead to systematic carbon losses in certain regions. This is distinct from other types of natural/ecological risks in that it involves a new class of threats that may be more difficult to insure, as historical experience is lacking.
3. **Demand-side risk:** Where the demand for agricultural crops is the main driver of deforestation, an increase in prices on the national or world market may drive up opportunity costs to levels above the carbon prices agreed, making forest conversion profitable.
4. **Failure of project partners:** Risk related to non-performance of the project can be due to, for example, ineffective project management, insecure tenure rights to the forest (encroachment), or bankruptcy of project partners.
5. **Political risk:** A change in government may lead to a change in or reversal of any prior approvals or commitments. The same may occur in the event of civil unrest. Depending on how the REDD mechanism will be ultimately designed a change in status from non-Annex I to Annex I country may also impact subnational activities.

In case of natural events (risk type 1), traditional forest insurance covers the difference between the salvage value of timber and the commercial value of the trees at maturity. Contracts are usually renewed on an annual basis, in order to reflect the actual risk profile. This coverage can be expanded to the carbon fixed in vegetation. This expansion would require insurance companies to participate in the emissions market.

Long-term climate variations (type 2) will not uniformly lead to worldwide damages, but they can negatively impact large areas, while climate change may lead to increased biomass growth in other areas. In case indirect human interference can be factored out, these risks (and benefits) will not be attributed to the individual activities.

The risk for a change in commodity prices (3) can be shared between funding agency and landowner by including an indexing clause in the contract that foresees additional payments during times when the prices of, say, soy or palm oil move outside a predetermined price corridor.

In case the project owners fail to meet the obligations or disappear (4) and permanent credits have been created, the ultimate liability will fall back to the government, most likely the one of the selling country. In order to be able to respond to this risk, the national REDD focal point may ask for an in-kind risk premium (e.g. a credit sharing clause), before approving a subnational activity.

Political risks (5) can be minimised by broad participation in the climate regime and by international cooperation. Nevertheless, under an international agreement like the United Nations Framework Convention on Climate Change (UNFCCC), the basic construct is that states are permanent and comply with treaties. Legal enforcement options against states are necessarily limited.

8.2.2 Liability management

Permanence risks apply independently from any credit trading under a future REDD regime. Under a national approach, the concern is no longer the permanence of particular forest areas, but whether the country as a whole continues to maintain reductions below the reference level established, regardless of where the particular reductions are coming from. A critical question then arises: What happens if the country exceeds its reference level? One option is the requirement that the nation makes up the reductions or pay some other penalty. Under a 'debit system', for example, any emissions above the reference level will be deducted from a future account (perhaps plus interest or some additional penalty). The extra emissions must then be made up before any later reductions below reference level are credited (Schlamadinger and Johns 2006).

However, before REDD countries accept full liability for reductions achieved or if REDD credits from subnational activities are to be made fungible with other mitigation credits or allowance units, the resulting commercial risks need to be securitised. The following options exist:

1. **Temporary crediting** conditions the validity of carbon credits from land use to the continued existence of the carbon stocks (Blanco and Forner 2000). This approach has been applied under the afforestation and reforestation (A/R) clean development mechanism (CDM). Depending on the modality, emissions reductions have to be either recertified or reverified after five years for the credit to remain valid. In the CDM, when the project lifetime (up to 60 years) ends or in case of premature losses, credits need to be replaced by other types of emissions allowances. Thus, under the current CDM rules, temporary crediting always creates a future debit, independently of the fate of the carbon stocks built up.

2. The so-called '**ton-year approach**' was discussed in the Intergovernmental Panel on Climate Change (IPCC) Special Report on Land Use, Land-Use Change and Forestry (Watson *et al*. 2000). It departed from the ideas that (i) the present value of mitigation is higher today than the same mitigation effect tomorrow, and that (ii) there is a limited residence time of CO_2 in the atmosphere. The combination of human time preference and the natural decay period led various authors to the calculation of an 'equivalence period', after which forestry mitigation could be considered permanent. Authors proposed the length of this equivalence period to be between 42 and 100 years (Fearnside *et al*. 2000; Moura Costa and Wilson 2000; Fearnside 2002). Consequently, with an equivalence period of 100 years, keeping 100 tons of CO_2 out of the atmosphere over 1 year would be equivalent to 1 ton of CO_2 permanently removed. This type of accounting has a big drawback in the cash flow: full payment for permanent reduction accrues after the end of the equivalence period, while the costs are mainly frontloaded. Nevertheless, the private sector might separately be willing to advance upfront loans based on the credit worthiness of the project and the expected future stream of payments.
3. **Project credit buffers** are another option used in voluntary mitigation projects. Only a certain share (e.g. 50%) of the credits generated are sold, while the remainder is held in an escrow account for a predetermined period (e.g. 50 years). A proportion of these credits are liberated as the guarantee period ends if no losses have occurred.
4. **Risk pooling** is a variation of project credit buffers where several projects maintain a joint credit buffer, thus minimising the risk of damages occurring simultaneously. The individual project buffers can be smaller than non-pooled project credit buffers. The same would be the case for a national-level REDD program in which risks are spread across activities and regions across the country.
5. **Insurance** is an advanced version of risk pooling. A third-party insurer selects a portfolio of insured projects in a way that several growth regions and ecosystems are covered, thereby limiting the risk of occurrence of massive simultaneous damages. The risk premium is paid in emission reduction units. In case of a damage event, the insurance company replaces credits lost by the ones held in stock. The residual risk is hedged by financial instruments and re-insurers (Subak 2003). This scheme can also lead to an improved cash flow for mitigation activities.
6. **Shared liability or forest compliance partnership (FCP),** is a proposal for managing national-level liability under a 'bubble' approach on land use accounting between two or more Annex I and non-Annex I countries (Dutschke and Wolf 2007). Under this construct, developed countries would bear a negotiated share of the liability for the permanence of REDD credits once they are certified. They could account for the land-use sector under their sectoral target, stipulated under Kyoto Article 3, paragraphs 3 and 4 or any new agreement agreed upon. The FCP suggests

that a developed country receives preferential access to REDD credits for compliance if it shares the liability. The proposal assumes that for compliance with Annex I targets, certain restrictions apply with regard to the use of REDD credits. Aid donors would also become motivated to invest in forest governance. Bilateral funding will be directed into the most effective policies and measures to reduce emissions in the forestry sector. The special relationship between REDD countries and their Annex I stewards will have repercussions on the private sector too, because FCP limits the country risk for subnational activities with foreign participation.

Several combinations of the above options are possible. For example, options 1 and 2 can be combined with a sliding cancellation of debits incurred from temporary crediting over time (Dutschke 2002), thus improving the cash flow for mitigation activities. Temporary forestry credits have to be replaced in the future, but each year until the equivalence period a prorated percentage of this future debit is forgiven, in case no damage occurs.

All except option 1 limit the liability over a predetermined timeframe. The ton/year approach considers forestry mitigation effects permanent after the equivalence period. Credit buffers and insurances release credits from the escrow account, as no damages occur for a certain number of years. For A/R CDM projects in the first commitment period, no temporal horizon of the risks for sequestered carbon could be agreed upon. Therefore temporary crediting was chosen that assumes all mitigation to be lost after project termination. Nevertheless, this assumption has stifled the market's appetite for temporary and long-term certified emission reduction. As the price of temporary credits point to the future value of replacement units, these credits are highly speculative and lose their value if more stringent targets are expected for subsequent commitment periods. With stable market signals in place and banking of credits being allowed, this situation may change in future commitment periods.

With the 2 degree Celsius target to be reached until the middle of this century, the timeframe for mitigation action is much clearer now than it was when rules and modalities were discussed for A/R CDM. Thus, all the options dismissed at that time can come back into consideration for REDD liability management.

8.3 Evaluation of liability management

Assigning liability is a precondition for credit fungibility. Independently from the mode of financing proposed under a REDD system options, the criterion of environmental effectiveness requires that the overall effect is a lasting reduction of GHG levels in the atmosphere. Table 8.1 lists options that have been proposed for safeguarding permanence of emissions reductions and carbon uptakes in terrestrial systems, and each of them is assessed in terms of the 3E criteria used in this book (effectiveness, efficiency and equity). Options 1 and 2 avoid a clear allocation of liability and consequently are suboptimal in terms of all three criteria. In the start-up phase of a nested approach (chapter 4), temporary crediting may be a useful fix, before national REDD targets are set and the ultimate country liability is determined. After that, credits may be converted from temporary to permanent. Once there is ultimate country liability, like in the case of Annex I parties, any re-emission is captured in the national inventory and is taken into account when meeting emissions reduction commitments.

The options listed are non-exclusive; they may be seen as a logical succession, once the activities reach a certain volume. In options 4 and 5, there may occur 'cherry-picking' of 'good risks' by pool operators. Annex I countries should consider providing international start-up finance to organise larger pools, make these accessible to countries perceived as 'high risk', or work with these countries to reduce their risk profile. Option 6 is only related to national-level REDD, and it is complementary to all other options. It offers potential investors and insurers higher confidence that ultimate liability for credits is backed by Annex I support, and thus political risks are minimised. It has the potential to increase the effectiveness of policies and measures in the land-use sector and bolster private investment in REDD. It is equitable in that it can contribute to the attractiveness of countries that would otherwise have difficulty attracting REDD investment because of their political risk.

Table 8.1. Options for securitising permanence in terrestrial carbon management

		Effectiveness	Efficiency	Equity
1	**Temporary crediting**	**LOW** Start-up option for small overall carbon volumes and isolated activities	**LOW** Complex accounting, high transaction costs and low-value credits result in minimal use	**LOW** High transaction costs benefit large projects

Table 8.1. (continued)

		Effectiveness	Efficiency	Equity
2	**Ton-year accounting**	**LOW** Low upfront pay and low net present value (which depends on discount rate), limited incentives	**LOW** Leads to heavy discounts in credits, which causes cash-flow problems	**LOW** High financing costs exclude poorer participants
3	**Project credit buffers**	**MEDIUM** Effectiveness depends on project credibility and maintenance of buffer	**LOW** High unaccounted share of credits, late cash-flow	**HIGH** Easy and transparent implementation
4	**Risk pooling**	**MEDIUM-HIGH** Effective instrument, depending on pool's size and distribution	**MEDIUM-HIGH** Smaller relative buffer size	**MEDIUM** Organisational capacities required, risk of free-riding, but fairly equitable
5	**Commercial insurance**	**HIGH** Outsourced liability, instrument for mature markets, low hurdles	**HIGH** Low transaction costs through outsourced risk assessment and management	**MEDIUM** May be equitable if socially desirable 'bad risks' are subsidised
6	**Shared liability**	**HIGH** Will give additional incentives to readiness and capacity building, thus preparing the ground for effective REDD	**HIGH** Will make REDD insurable, as country risk is minimised	**HIGH** Depending on the motivation of Annex I parties involved, may contribute to fostering investment in high-risk countries

8.4 Conclusion

Building up, managing and conserving carbon pools, whether in forests or elsewhere, entails the risk of non-permanence. This risk needs to be addressed for any climate change mitigation. Further, in order to make credits resulting from forestry mitigation fungible with other credits and emission allowances, liability mechanisms are needed. The risks for forest carbon stocks can be mitigated in a staggered approach, with different mechanisms covering different risk layers. The most efficient mechanism for risk pooling is national liability of REDD countries in case risk mitigation strategies should fail. As REDD governments do not (yet) have GHG targets for the whole economy, they are not in the position to cross-compensate underachievement in forestry

with overcompliance in another sector. A shared sectoral liability ('emissions bubble') between developed and developing countries may thus add to the REDD system's stability. For the respective developed country partner, the benefit could be preferential access to the partner's REDD credits.

The chapter has offered a summary of tools proposed for reducing carbon risks in forestry and for securitising carbon contracts from forest mitigation activities. This toolbox is the result of pilot project development and a vivid methodological debate at the UNFCCC level over the last decade. Permanence and liability under a REDD mechanism can be realised by combining a variety of complementing approaches. The REDD decision expected in Copenhagen 2009 should offer a menu of choices based on what best serves different country circumstances.