

Reducing Emissions from Deforestation and Forest Degradation: A Systematic Approach

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As up to 20 percent of global anthropogenic greenhouse gas emissions result from deforestation activities, the reduction of emissions from deforestation and degradation of forests (REDD) is a major theme of the ongoing negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). This briefing looks at the fundamental issues underlying REDD, as well as the challenges involved in current proposals to implement a trading scheme for REDD credits.

Summary

- Trees continuously capture and store carbon. However, when destroyed (e.g., by fire), they release carbon dioxide (CO₂) into the atmosphere. With the living carbon storage capacity of much of the world's tropical forests diminishing at a rapid rate through deforestation and forest degradation, many believe that the reduction of emissions from deforestation and degradation of forests (REDD) must be a fundamental part of overall approaches to climate change mitigation. Avoiding deforestation, however, requires the introduction of financial mechanisms that make the retention of forests economically competitive.
- Efforts are currently under way to elaborate a scheme whereby credits could be issued for REDD and traded in the same way as carbon credits are traded under the clean development mechanism of the Kyoto Protocol. Any REDD credit-generating system is likely to operate under the principles of the ministerial statement issued at COP14 in Poznan in December 2008. This incorporates: (1) development of transparent, collaborative, balanced, and inclusive international arrangements to support national REDD efforts; and (2) elaboration of a reliable framework to measure, report, and verify (MRV) emission reductions.
- The main challenges to the implementation of a viable REDD scheme are: (1) how to generate globally consistent emission reference scenarios at the country level from which to derive fully MRV'd REDD credits; and (2) elaboration of a "water-tight" financial mechanism whereby REDD credits, in the same way as carbon credits, could be issued and traded for avoided deforestation.
- While any REDD actions at national, regional, or project level would be tailored to maximize emission reductions, they should recognize the different ecological and social co-benefits of forests, namely: (1) the conservation of terrestrial biodiversity; (2) their important cultural, spiritual, and recreational roles in many societies; and (3) their contribution to the economic life of hundreds of millions of people.
- The establishment of an "International Emission Reference Scenario Coordination Center" (IERSCC) as a basis for deriving fully MRV'd REDD credits and an "International Emission Investment Reserve" (IEIR) to finance REDD activities are discussed here, along with the safeguarding of forest co-benefits under a REDD scheme.

“To guarantee a streamlined application of REDD methodologies and data, the establishment of an International Emission Reference Scenario Coordination Center is proposed.”

Implementing a workable REDD scheme

REDD can be successful only if the reduction of emissions from forests can be made measurable, reportable, and verifiable, and if sufficient financial incentives are provided in a timely manner. Two international institutions for monitoring and financing as part of an overall fair, effective, and efficient overall framework for REDD are proposed here (see chart, p.3). They are intended to catalyze the current policy process by providing pragmatic and flexible solutions for the design and implementation of a REDD scheme.

Establishment of an “International Emission Reference Scenario Coordination Center” to set reference levels and verify emission reductions for REDD

As avoided deforestation and degradation in developing countries would be matched by financial compensation from Annex I countries, the first key requirement of any potential REDD mechanism, acceptable to both developing and developed countries under a market or fund mechanism, would be for REDD actions/credits to be based on measurable, reportable, and verifiable (MRV) data. This would include setting MRV'd reference levels (RL) to prevent parties (projects and/or countries) setting inflated baselines in order to generate more carbon credits for future emission reductions:

- The first step would be to establish national REDD reference levels in a fair, transparent, and efficient way as a basis for assessing future emission reductions. RL would be based on measurable indicators of country-specific drivers of deforestation, national circumstances, and historic deforestation rates—a multitude of methodologies for the collection and interpretation of forest area change, emission data, and deforestation drivers already exist. However, many developing countries still lack the necessary capacity to fulfill these requirements.

- To guarantee a streamlined application of REDD methodologies and data, the establishment of an International Emission Reference Scenario Coordination Center (IERSCC) is proposed. This would act as an independent global clearinghouse for harmonized data to be used in implementing reference level methodologies and in future



REDD monitoring. The IERSCC would be tasked with collecting, reporting, and subsequent processing of Earth observation, deforestation- and degradation-driver information in a globally consistent manner. It would also assist, coordinate, and supervise the computation of national reference scenarios according to rules negotiated under the UNFCCC. National governments could request support, when needed, from the IERSCC in calculating their national RL and subsequent emission reductions.

- The IERSCC could serve as a central coordinating REDD capacity-building institution for monitoring and RL development in conjunction with other capacity building efforts such as the UN-REDD Programme. If possible, the IERSCC should be integrated into existing institutions like the Intergovernmental Panel on Climate Change (IPCC) or the UNFCCC secretariat to limit its administrative burdens.

Establishment of an “International Emission Investment Reserve” to finance REDD

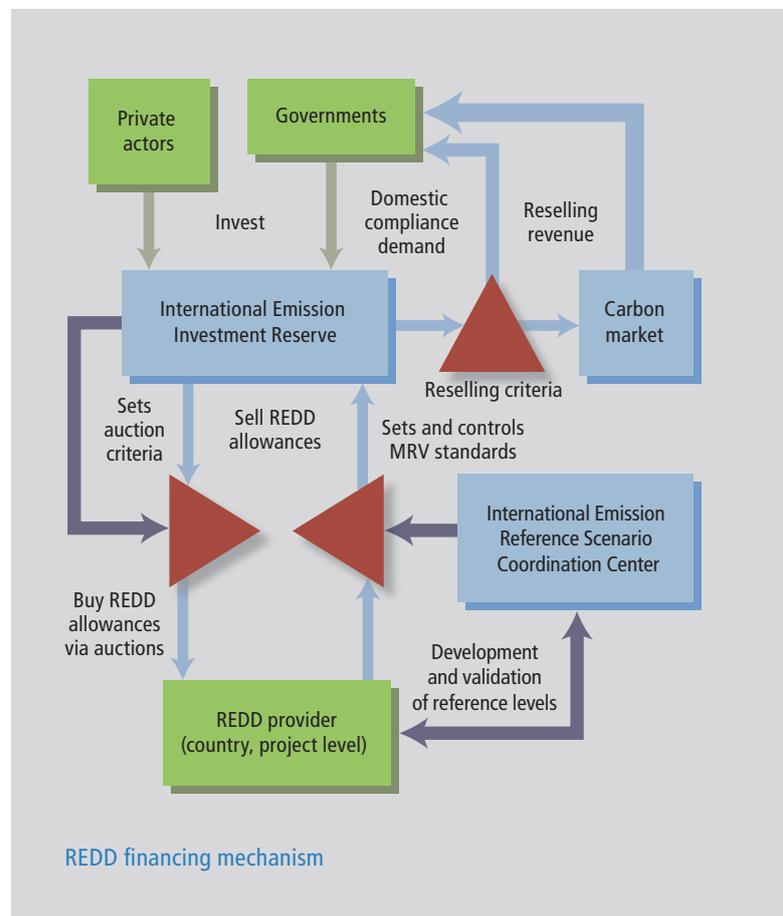
According to the *Eliasch Review*, the cost of halving net global CO₂ emissions from forests by 2030 is estimated at US\$17–33 billion annually, but only if REDD is included in global emissions trading. However, simply adding avoided deforestation carbon credits to the existing carbon trading mechanisms threatens a flood of cheaper credits into global and linked domestic carbon markets due to the potentially high quantity and relatively low prices of REDD credits.

REDD carbon credits are estimated to emerge in the range of US\$4–10 per tonne of carbon avoided. A 2007 study from the Woods Hole Research Center concluded that 94 percent of Amazon deforestation could be avoided at a cost of less than US\$5 per tonne of carbon. These levels compare to the US\$25 to US\$35 per tonne current trading range of existing offset carbon credits. Thus if REDD credits were introduced to the global carbon market, industrialized countries could find it easy to fulfill most of their targets with cheap REDD. Moreover, both the potentially high quantity and low quality of REDD credits in the carbon markets could threaten the climate integrity of REDD and counter other climate protection targets:



- The establishment of an International Emission Investment Reserve (IEIR) is proposed to serve as a special form of investment fund for REDD. The IEIR would be a public investment scheme managed and administrated by a board of trustees consisting of investors and other relevant stakeholders. Its integration into existing international institutions such as the UNFCCC would be helpful in achieving legitimacy and avoiding administrative overburdening. The majority of capital for the IEIR would be provided by Annex I governments based on politically negotiated mandatory investment pledges to increase the trust in the scheme. Other investment sources would be flexible and could include private investments.
- The functioning of the IEIR can be described as follows:
 - REDD providers (developing country governments and/or private carbon projects) auction their yet-to-be-created REDD units to the IEIR. The unit price would be below the carbon-market-credit value and possibly discounted because of implementation risk and measurement uncertainties. The price would also be influenced by the amount of co-benefits secured by the emission reduction units claimed.
 - The auction mechanism in question is the second-price sealed-bid auction. Under this procedure, sellers of verified REDD credits would submit to the IEIR sealed bids proposing a minimum selling price per fixed unit or a maximum selling quantity per fixed price (the seller's "best price"). The highest REDD bidder is able to buy the credits at the second-best selling price per fixed unit or the second-maximum selling quantity per fixed price (the "second-best offer"). This continues until the finance is exhausted or the targeted emission reduction quantity of the IEIR is reached. This auctioning approach can ensure that a fixed quantitative REDD supply cap is achieved in a competitive setting.
 - The units are verified and then banked until market conditions are favorable for reselling them as fully fungible (interchangeable) MRV-based REDD credits to the carbon market. With many models projecting rising carbon credit prices, this will allow

considerable reselling profits. To avoid market flooding the reselling can be conditional in terms of maximum number released per year, sufficient market demand, etc. The IEIR members would have an interest in reselling at higher market prices to increase revenue. Depending on its governing rules, the IEIR could act as a "central bank" to the carbon market controlling carbon price volatility.





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Tropical rainforest on the island of Fatu Hiva, Marquesas Islands, French Polynesia
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Protecting co-benefits

As aggressive use of REDD policies could run into conflict with basic food-security issues and ultimately harm the very environments that REDD is seeking to safeguard, the protection of forest co-benefits under a REDD scheme is paramount.

To make provision of the essential co-benefits of REDD attractive and cost-efficient, it is proposed that the provision of co-benefits could be used either as a qualifier criterion or as a pricing criterion for the auction:

- If the REDD units, although MRV'd, fail to meet sustainability requirements, they are excluded from the auction. The sustainability requirements would be based on quantified and certified amount of ecosystem value points—ideally negotiated under the umbrella of the relevant UN conventions and charters.
- Alternatively, a co-benefit factor scale from 0.5 to 1.5 could be established, under which the price of REDD units offered by the winning bidder would be increased by a factor of 1.5 for maximum co-benefits or reduced by a factor of 0.5 for lowest possible co-benefit protection.

Conclusions

The new institutional arrangements outlined above could help overcome some of the deficiencies inherent in monitoring and financing schemes that currently hamper the effective inclusion of the forest sector as a critical component of carbon emissions mitigation strategies. However, the following factors must be taken into account:

- The methodology for setting RL and for assessing emission reductions must be carefully designed to prevent non-additional emission reductions (i.e., emissions that would have been reduced anyway) and an inflated supply of REDD credits—hence, the proposal for the International Emission Reference Scenario Coordination Center (IERSCC).

- The financing of REDD under an International Emission Investment Reserve would allow timely provision of large sums for REDD, enabling up-front financing for tackling deforestation in meaningful quantities. A powerful financing mechanism of this kind is needed for REDD to provide international resources without risking carbon market flooding.
- The use of the second-price sealed-bid auction, with an in-built system of co-benefit safeguards, would seem to offer the fairest method of assessing the price of units sold by REDD producers. It is hoped thereby to incentivize providers to provide a low unit price and high co-benefit performance.
- To reach these robust MRV standards, REDD readiness funding will be crucial in the coming years. The flexible structure of the IEIR will allow early and fluent phasing for this vital resource.

Further information

This Policy Brief is based on work from the following two research projects funded by the European Commission under its sixth and seventh framework programs, and coordinated by IIASA:

- The **GEOBENE** (Global Earth Observation – Benefit Estimation: Now, Next and Emerging) project aims to develop methodologies and analytical tools to assess societal benefits of global earth observation in the domains of disasters, health, energy, climate, water, weather, ecosystems, agriculture, and biodiversity. More at: www.geo-bene.eu
 - The **CC-TAME** (Climate Change: Terrestrial Adaptation & Mitigation in Europe) project concentrates on assessing the impacts of agricultural, climate, energy, forestry and other associated land-use policies considering the resulting feed-backs on the climate system in the European Union. More at: www.cctame.eu
- For in-depth information on the research summarized in this brief, see:
- Obersteiner M, Huettner M, Kraxner F, McCallum I, Aoki K, Boettcher H, Fritz S, Gusti M, Havlik P, Kindermann G, Rametsteiner E, Reyers B (2009). On fair, effective, and efficient REDD mechanism design. *Carbon Balance and Management*, 4:11 [doi:10.1186/1750-0680-4-11].