REDD Finance Mechanisms

TFD Background Paper
Draft for discussion (22 April 2009)
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Summary

This paper aims to provide an overview of the current and proposed financial mechanisms for implementing REDD under the UNFCCC framework, and to identify fracture lines and commonalities between stakeholders over these mechanisms. The purpose is to provide information which can help stakeholders to identify obstacles and possible solutions for developing common views for implementing REDD financing schemes. Selected aspects related to the scope of REDD, financing mechanisms and sources, benefit sharing and participation as well as reference levels, eligible activities, measurement, reporting and verification are discussed. A tentative identification of commonalities, divergences and fracture lines in stakeholder views is made to facilitate focusing of the TFD dialogue in New York City, 25 to 26 April 2009.

1. Purpose of the Paper

Forests are both a problem and a solution for climate change. Deforestation alone accounts for about 18 per cent of the global GHG emissions. The Stern report (2006) made it clear that avoiding deforestation would be among the lowest cost mitigation options to avoid increasing CO_2 emissions and possibly also increasing sinks. At the same time, other benefits like poverty reduction biodiversity conservation, soil and water conservation, and climate change adaptation could be enhanced.

The Bali Road Map of the UNFCCC COP-13 made a decision on REDD[1] calling for

> *Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries; {1.(b)(iii)}.*

This represents a comprehensive approach ("REDD plus") for developing countries including both (i) reduction of emissions from forests, (ii) conservation and sustainable forest management (SFM), and (iii) enhancement of carbon stocks which can be achieved by various forest management measures. Table 1 illustrates various mitigation options in forestry. In fact, SFM is a cross-cutting theme in all these elements for climate change mitigation.

As an important mechanism to tackle climate change in the post-2012 era, forest mitigation options, especially REDD, have been the center of heated discussions and

[1] Decision 2/CP.13

therefore the outcome of COP-13 was an important milestone. For the identified forest mitigation options to be successful, a robust, coherent and dynamic financing scheme

Table 1. Overview on mitigation approaches

Mitigation option	*Mitigation objective*	*Mitigation policy instrument*	*Forest/Land Management Option*
Reduce GHG emissions	Reducing deforestation	REDD ("first D")	**Reducing emissions from existing forests (through avoidance their conversion to other uses)** (law enforcement, creation and effective management of new protection areas, payments for environmental services in form of contractual agreements)
Increase CO2 sequestration (removals of CO2)	Reducing degradation ⇕ Enhancing existing carbon pools	REDD ("second D")	**Conservation and sustainable management of forests** (restoring lost carbon pools and enhancing the existing ones) (multiple-use forest management for carbon density, timber, non-timber forest products, other environmental services, including restoration of degraded forests)
	Creating new forests and tree cover	CDM A/R (outside forests)	**Expansion of carbon stocks through creating new carbon pools** (planted forest, facilitated natural expansion of forest; rehabilitation of degraded lands by tree planting and revegetation; agroforestry; agro-sylvo-pastoral systems; etc.)

Source: Adapted from Blaser, Robledo and Skutsch, 2009

needs to be designed, negotiated and implemented as developing countries cannot be expected to generate such global public goods as forest-based climate change mitigation without external support. Such a scheme may include one or more mechanisms. Several proposals have been suggested for forest carbon financing including market mechanisms, fund-based systems, and their combinations. Access to and participation in such mechanisms may differ among public and private stakeholders in developed and developing countries.

REDD financing as a win-win instrument can bring a whole range of benefits but the interests vary among stakeholder groups. For developing country governments REDD would represent a new source of financing for national development priorities (e..g. health and education); for developed countries it would be a cost-efficient option for carbon offsets; for environmental NGOs REDD could generate additional resources for biodiversity conservation; for the rural poor it could bring badly needed income and financial support to communities and smallholders as well as a means to improve their forest tenure rights; for the private sector REDD can be an additional source of funding to make SFM in natural tropical forests and rehabilitation of degraded lands financially viable; for politically powerful groups REDD financing can become yet another opportunity of income; for multilateral development banks it can open up new ways of

doing business in the context of maintenance of global public goods; and for intergovernmental organizations it offers a new area of intervention in technical assistance and a new funding source.

However, meeting such a broad range of interests will be difficult. In addition, various policy and implementation options of REDD financing will have other impacts than climate change mitigation in terms of environmental, social and economic consequences which can be positive (often referred to as co-benefits), negative (often referred to as risks) or neutral. These impacts can touch significant stakeholder interests and therefore their assessment through a participatory process is necessary.

With the upcoming COP-15 in December, where the post-2012 mitigation regime is to be defined, there is an urgent need for leaders to clarify the advantages and disadvantages of potential financial mechanisms for forest carbon in order to facilitate further discussion and informed decision making on the future climate change regime. The purpose of this draft scoping paper is to provide background information for facilitating the dialogue under the TFD. On each key issue, some tentative conclusions are made on stakeholder views concerning commonalities, divergences, or fracture lines while recognizing that the difference between the latter two is often like a line drawn in water. The paper does not attempt to be a comprehensive review and many important issues on which there are different stakeholder views are only mentioned in passing (e.g. leakage, additionality, permanence) as they have already been extensively debated in other fora.

2. Scoping REDD

Views differ on what should be covered by REDD financing: should it be limited to reduction of deforestation and forest degradation only, or should it also cover other forest options for mitigation of climate change (Table 1). This largely boils down to how "enhancement of forest carbon stocks" and "sustainable management of forests" in COP-13 Decision 2 are interpreted, i.e. which activities are allowed within REDD (Table 2). The key divergence in this respect appears to be whether creation of new sinks through afforestation and reforestation are included as they are currently covered by the Clean Development Mechanism (CDM)[2] and what activities are covered under REDD. The concern here is which lands (non-forest land or forest land with existing forest cover) are used in order to avoid REDD becoming a perverse incentive to promote inappropriate conversion of existing forests to large-scale industrial plantations.

More than two thirds of the global mitigation potential by forests is located in developing countries of which REDD can generate 40% and Afforestation/Reforestation and forest management 30%, each. One third of the developing country potential is located in Latin America and the Caribbean due to its high deforestation rate (IPCC 2007).

Individual mitigation activities have different potentials to contribute to climate change mitigation. For instance, in the Brazilian Amazon forest, degradation is responsible for 20% of total emissions, in Indonesia forest degradation is responsible for two thirds of

[2] Defined as Afforestation/Reforestation in Article 3.3 of the Kyoto Protocol

the total decrease in the forest stock, and in Africa degradation is almost 50% of the annual rate of deforestation.[3]

Table 2. Forest mitigation activities

Changes in	Reduction of emissions	Enhancement of forest carbon stocks
Forest area (measured in hectares)	Reduced deforestation Creation of new forests	Afforestation and Reforestation (A/R), rehabilitation of degraded forest lands (not classified any more as forests), natural expansion of forest to non-forest land
Carbon density (measured in amount of carbon stored per hectare)	Reduced forest degradation Management of existing forests for carbon benefits	Sustainable forest management, including conservation, restoration of degraded forests, regeneration, and other forest management activities

Source: Adapted from Angelsen et al. (2009)

Stakeholder views on the scope of REDD financing may be summarized as follows:[4]

Commonalities

- REDD should address both deforestation and forest degradation
- Only developing countries/other non-Annex I countries can participate
- Need to consider co-benefits

Divergences

- First priority to be given to reduction of deforestation
- Relative priority to be given to carbon enhancement activities; carbon density in existing forests/new carbon pools
- Relative priority to be given to co-benefits
- National, government driven large-scale approach versus local stakeholder driven small-scale approaches for REDD

Fracture lines

- Enhancement measures to be included, particularly creation of new carbon pools through large-scale plantations
- Eligibility criteria for participating developing countries

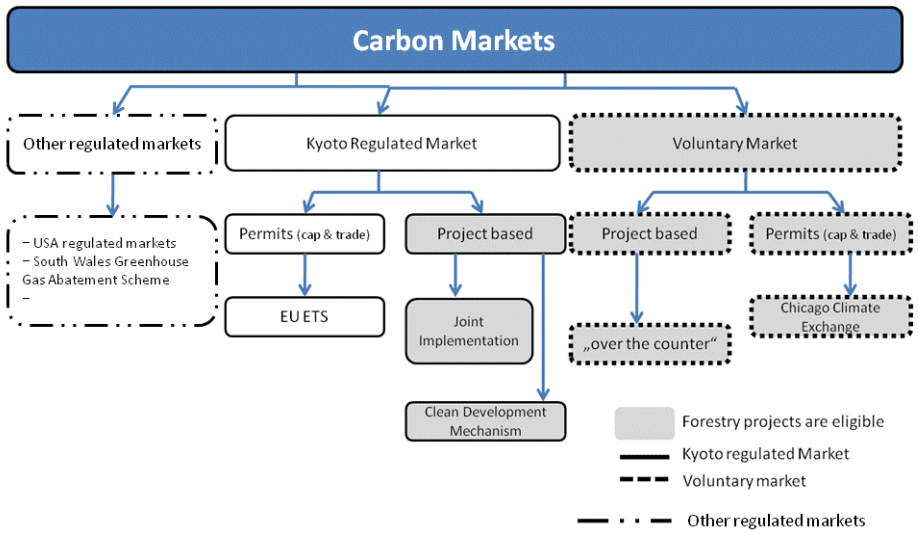
3. Financing Mechanisms for REDD

There are three types of carbon markets: (1) the market that aims at achieving the commitments under the Kyoto Protocol (Kyoto regulated marked); (2) the regulated market outside the Kyoto Protocol, and the market that is trading voluntary emission

[3] Asner et al. (2005), Marklund & Schoene (2005) and Lambin et al. (2003) as cited by Angelsen (2008).
[4] Largely based on Global Canopy Programme (2008).

reductions (voluntary markets) (Figure 1). In each market, two modalities of trading options can be distinguished: (i) permits or allowance trading, and (ii) project-based trading. Forest-related mitigation options are included in the Kyoto-regulated market (CDM A/R) and in the voluntary market (planting forests and avoiding deforestation).

Figure 1. Carbon markets



REDD financing has been proposed as the three current mechanisms for forest carbon offsets have proved to have a limited impact:

- By March 2009 the CDM, the only mandatory scheme covering forest-based carbon offsets, has been able to approve only two A/R projects. There are about 30 projects in the pipeline suggesting that there is a potential supply for A/R which has not been possible to meet by the Mechanism. Three problems have made CDM financing cumbersome in forestry: (i) there is a lengthy process of 1-2 years in getting CDM projects fully formulated, validated and approved, (ii) transaction costs are so high that smaller projects are not viable, and (iii) particular characteristics of forestry projects related to additionality, leakage and permanence which are not required in the well functioning energy sector part of the CDM markets. For these reasons many feasible projects for CDM have in fact been introduced to the voluntary markets.
- The non-Kyoto regulated markets in the United States and Australia (New South Wales) cover forest carbon offsets but they are still small compared to the Kyoto-regulated CO_2 markets.
- The voluntary over-the-counter (OTC) markets are currently the only source of carbon finance for avoided deforestation. Forestry-based credits account for 36% of the total voluntary market (USD 331 million in 2007) and have been able to also incorporate small-sized projects (Hamilton et al. 2007).

Avoided deforestation which involves forest conservation through various measures had access to the early Joint Implementation (JI) and Activities Implemented Jointly (AIJ) carbon offset schemes in Europe and the United States, respectively. These schemes were implemented in the 1990s and were targeted at the private sector. They demonstrated that a potential demand exists[5] and that implementation capacity can be rapidly built up by the private sector (Moura Costa 2008).

Even though in the short run the unregulated market is likely to play a critical role in developing new ways of implementation, it cannot provide a substantial solution and therefore other mechanisms for REDD financing have been proposed.

REDD activities in developing countries can be financed through three main options (Global Canopy Programme 2008):

(i) a voluntary fund could operate at the national (i.e. uni- or multilateral) or international scale raising funds e.g. from Official Development Assistance (ODA) and other public and private sources;
(ii) a direct market mechanism for REDD credits would be traded alongside existing certified (or verified) emissions reductions (CERs), and could be used by companies in Annex I countries to meet emissions targets in their national cap-and-trade systems; or
(iii) a hybrid/market-linked mechanism would generate finances through either an auction process or by establishing a dual-market in which REDD credits are linked to but are not fungible with existing CERs. Norway's proposal to auction Assigned Amount Units (AAUs), the Center for Clean Air Policy's "Dual Markets" approach and Greenpeace's TDERM are examples of market-linked mechanisms.

Recent developments and the weaknesses and strengths of each option suggest that a combination of these approaches may be needed to address the specific forest and socio-economic conditions and particular needs of developing countries. A common critical requirement for all the options is good governance to make contractual, performance-based REDD financing effective in practice.

In general, non-Annex I Parties call for new and additional contributions from developed countries. This may limit the financing potential of the first option and the sustainability of its funding flows as emissions reductions generated through a voluntary fund cannot be used for compliance by participating developed countries[6]. This is why many stakeholders have emphasized the need for market-based approaches but strong concerns have also been expressed on their constraints.

The role of market-based approach to be implemented on sub-national or project level is one of the contentious issues in the REDD financing options. It has been seen problematic for a number of reasons such as (a) interfering in the developing countries' sovereignty, (b) possible conflicts or difficulties related to the property rights of the forest carbon, (c) slowness of the complicated but necessary policy and institutional reforms

[5] The area of forestry projects under the AIJ/early JI schemes was about 4 million ha generating about 103 mill tC (Moura Costa 2008) .
[6] E.g. Moura Costa (2008)

which would lead to long delays in the implementation, etc. On the other hand, advocates for the market-based approach argue for (i) possibility for a rapid implementation start, (ii) large-scale funding potential as ODA and other public sources may not be able to match the needs in a sustained way, (iii) possibilities for effective risk management as problems of implementation are easier to address at local than national level, etc.

However, even in this case the governments' role would be crucial to create an enabling environment for the markets (a) to set up necessary national-level rules and rights for actors, (b) to contain other land use pressures on forests (incl. revision of land-use related fiscal and other incentives), (c) to map and plan land use and identify priority areas for REDD implementation, (d) to establish reference levels and monitoring systems of deforestation, degradation and leakage, etc. (Moura Costa 2008).

Recognizing these issues, a "nested" approach has been proposed by CATIE and supported by several Latin American countries drawing on the pioneering experience of Costa Rica. It aims to address project-level risk within national-level accounting mechanisms, i.e. individual carbon projects would not be credited unless the overall country emissions reductions were below the national reference level. This represents a joint public and private sector engagement in implementing REDD.

Obviously, both private sector investors and intermediaries (financing institutions, traders, certifiers, verifiers, consultants, etc.) in developed countries have an economic interest to promote the market-based approach for REDD financing.

A key argument against market-based approaches has been possible risk of flooding the international carbon market with REDD credits if they are fungible with other carbon credits. The theoretical potential supply of REDD credits is large, their delivery costs are estimated to be low[7] and they could depress the international carbon prices having a negative impact on reducing carbon emissions elsewhere and in other activities. As a solution to this problem, Moura Costa (2008) has proposed raising emission reduction targets, creation of (temporary) market quotas for REDD credits, or, as proposed by Ogonowski et al. (2007), creation of dual-markets.[8]

To address the problems related to the market-based approaches, Greenpeace has proposed a Tropical Deforestation Emissions Reduction Mechanism (TDERM) which would be a hybrid market-linked fund which would trade REDD credits that would not be fungible with the current CDM market and the price of these credits would be set either by auctioning or by setting a price linked to the price of Kyoto credits.

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[7] The costs would vary between countries and forestry situations. The lowest cost estimates based on opportunity costs start from less than USD 0.10/tCO2 (Woods Hole 2007.)

[8] The Dual Markets approach specifies the creation of a new carbon market for emissions reductions from deforestation and degradation that is linked with the overall reductions achieved by developed countries in the post-2012 timeframe, but is only partially fungible with the post-2012 global carbon market. Developed countries would commit a percentage of their post-2012 target to come from the REDD market. For example, if a country committed to an overall 30 percent reduction, they could also commit that 5 percent of that reduction would be generated through financing REDD activities in developing countries—the other 25 percent would come through domestic reductions or through purchasing reductions in the non-REDD post-2012 carbon market (Ogonowski et al. 2007).

Towards an ideal system

In order to address the inherent and varying constraints in developing countries and the need build up implementation capacity, a phased approach for REDD financing has been proposed by the Angelsen et al. (2009).

- PHASE 1: An initial support instrument that allows countries to access immediate international funding for national REDD strategy development, including national dialogue, institutional strengthening, and demonstration activities.[9]
- PHASE 2: A fund-based instrument that allows countries to access predictable REDD finance, based upon agreed criteria. Continued funding under this instrument would be results-based, but performance would not necessarily be monitored or measured only on the basis of emissions and removals against reference levels. Performance would be related to the implementation of National REDD Strategy Policies and Measures (PAMs).
- PHASE 3: A GHG-based instrument that rewards performance on the basis of quantified forest emissions and removals against agreed reference levels. In this phase transition from global facility to integration with compliance markets would take place.

Phase 1 would be financed by voluntary contributions, Phase 2 by a global facility which could be a unitary fund or a clearinghouse that records eligible bilateral and multilateral contributions. To ensure predictability, international REDD financing should be clearly identified and funding commitments firm, verifiable, and enforceable. International REDD finance would complement domestic funding by developing countries in accordance with their respective capabilities, taking into account preexisting national efforts and expenditure in sustainable forest management, forest protection, and forest inventories.

The proposal by Angelsen et al. (2009) includes elaboration of Phases 2 and 3 in detail including how eligibility for country participation in different phases could be determined and how financing mechanisms could evolve. Financing would start with initial voluntary contributions in Phase 1, then including various options in Phase 2 (e.g. involving various types of international levies), and finally in Phase 3 providing large-scale international finance including from private sources via global compliance carbon markets and/or domestic emission-trading schemes.

The proposal contains many elements of what could constitute an "ideal" approach to REDD financing as it addresses (i) capacity building, (ii) flexibility for entry by countries in different stages of development, (iii) performance-based payments starting with implementation of policies and measures to "deliver" climate mitigation, and (iv) integration of large-scale financing from a variety of sources, including from the private sector through carbon offset markets.

[9] FCPF and UN-REDD are already providing assistance to several countries for readiness capacity building.

Stakeholder views on the REDD financing mechanisms may be summarized as follows:[10]

Commonalities

- REDD financing should effectively contribute to the overall goal of reducing emissions
- REDD funding should be adequate, effective, sustainable and predictable
- Flexibility to address differing country situations and needs
- Phased approach starting with REDD readiness capacity building
- Combination of mechanisms (hybrids) is likely to be required
- Fund approach for capacity building is essential

Divergences

- Forest conservation through fund vs. market-based approach
- REDD financing is voluntary
- Mechanisms to raise financing

Fracture lines

- Market-based mechanisms for REDD payments
- National vs. sub-national/project based implementation, nested approach
- Fungibility of REDD credits with other Kyoto credits if market-based approach is applied

4. Benefits and Participation

The distribution of benefits between developing countries is to some extent implicit in the criteria for eligibility and setting the reference levels (Global Canopy Group 2008) which were discussed in sections 2 and 4, respectively[11]. In general, many proposals award benefits directly in proportion to generated emissions reductions rewarding historically large emitters and excluding those countries in which there is no deforestation or the loss of forest has been small. Some make also provision for allocating a proportion of benefits to countries other than those directly generating emissions reductions.

While REDD can provide new forms of financing for community forests, indigenous people and local communities, concerns have been expressed that the poor will not benefit and their forest tenure and use rights may be negatively affected when maintenance and enhancement of the forest carbon pools is introduced as a binding objective by REDD financing. Earlier experience shows that small-scale forest owners and forest communities have difficulties in accessing financing instruments, be they domestic or international. In REDD financing the transaction costs are likely to be high and the technical complexities are difficult to understand even by professionals. There is no clarity as yet about feasible national models to channel financial flows to indigenous people, local communities and individual forest owners. The accumulated experience is based on project or forest management unit-based compensation mechanisms, not national-level schemes like REDD.

[10] Largely based on Global Canopy Programme (2008).
[11] See also Annex 1

Without establishing clear and secure land tenure, it is unrealistic to assume indigenous people, forest and other local communities as well as smallholders to have access to REDD benefits and thereby to invest in SFM. Reform processes related to forest land tenure are politically sensitive, technically complex and resource demanding. Implementation tends to be sticky even within an adequate legislation if the administration cannot be effectively mobilized to implement the will of legislators. This has been frequently underestimated in externally funded programmes and projects to improve land tenure (Simula 2008).

As a means to address possible negative social and environmental impacts, safeguards and voluntary standards have been introduced. The existing voluntary forest carbon standards have somewhat different focus, some targeted at good quality carbon offsets (accuracy of measurement, risk management, etc.), some at broader sustainability concerns. The accumulated forest certification experience is being extensively drawn on for developing these standards but with somewhat mixed results.

Another issue which needs clarification is the participation of indigenous people, local communities as well as other stakeholders in the development of REDD financing mechanisms at international and national levels. For participation at the international level, the UNFCCC provides established rules and procedures but there are several options for how they could be applied in the case of REDD.[12]

Stakeholder views on the benefits and participation related to REDD financing may be summarized as follows:

Commonalities

- Rewarding based on performance
- Principle of equity
- Need to generate benefits to indigenous people and local communities that live in and from forests
- Common perception that adequate governance and tenure rights have to be strengthened for effective REDD implementation
- Need for capacity building and provision of information to rural communities, small-scale forest owners, indigenous people and other local groups as to how they can organize themselves to better participate in future REDD initiatives
- Existing rules of UNFCCC for participation

Divergences

- Interpretation of the equity principle
- Rewarding countries with high deforestation rates and penalizing others
- Focus and contents of forest carbon standards

Fracture lines

- Actual sharing/distribution mechanisms of benefits within country
- Making REDD pro-poor while being effective for climate change mitigation benefits

[12] See Angelsen et al. (2009) for discussion of options.

Lack of explicit views

- Options for stakeholder participation in REDD processes and implementation
- Possible need for mandatory standards
- Process of developing safeguards and standards

5. Reference Level

An inherent feature of REDD on which there is a general agreement is additionality. Most of the analytical work on how to determine it has focused on (reduced or avoided) deforestation while both methods and data for assessing degradation are weakly developed.[13] In the context of A/R several methodologies have been developed and approved in projects submitted to the CDM financing. In the case of SFM, several studies have been carried out on the additional costs of moving from unsustainable practices to SFM, notably under the ITTO.

As REDD financing is targeted at achieving additional reductions in emissions, there must be a basis for measuring them which involves (a) reference level and (b) reference period. As these will be directly linked with the performance-based REDD financing, the choice is politically important. Reference level is the agreed baseline used for crediting emissions reductions for rewarding a country if its emissions are below that level (Angelsen et al 2009).

Reference levels define the business-as-usual scenario (BAU) over a predefined scale and can be used to determine the additionality of a given activity (Global Canopy Programme 2008)[14]. The emission reductions realized are calculated as the difference between the actual emissions and the reference level.

The reference level can be established at (i) sub-national[15], (ii) national or (iii) global level[16]. While there is a common view that national reference levels are needed, views differ on the desirability of sub-national and global reference levels. Sub-national reference levels would allow developing countries without proper national carbon accounting systems to participate and provide an incentive for implementing individual projects and targeted sub-national level activities. The problems of leakage would have to be addressed in this case in a more detailed way than in the case of national reference levels. Global reference levels have been proposed as an additional measure to address international leakage.

Reference levels can be established by (i) historical development-based trend analysis, (ii) using the current emission levels, or (iii) projecting a BAU scenario through various methodologies[17]. The choice between these options will influence potential benefits to be

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[13] There is an on-going CPF process to improve the situation.

[14] Angelsen et al. (2009) note that reference level can be seen as modified BAU baseline which is a technical prediction, reflecting "common but differentiated responsibilities to ensure global additionality and larger overall GHG emissions reductions" as defined in the UNFCCC Article 2.

[15] This can also include a project level if that is applied.

[16] There are some on-going discussions on regional-level reference levels, e.g. for the Mekong sub-region, the Congo Basin, in particular in the context of considering regional leakages.

[17] Angelsen et al. (2009) provides a review of methods and proposes the following variables to be relevant in establishing reference levels: (i) historical national deforestation, (ii) forest cover, (iii) GDP per capita, and (iv) a global additionality factor.

reaped by countries in different situations with regard to their forest cover and deforestation rate (see section 2).

As there are inherent elements of uncertainty in projecting future forest area or forest carbon stocks, adjustment factors may be needed and they could also address various sources of risks in achieving REDD objectives. Determination of these adjustment factors are being developed in the context of carbon accounting methodologies through scientific research.

There is a broad common preference to use historic emissions as reference level for national and global scale. Sub-national approaches may be more applicable for projected BAU scenarios. The difference may be less significant if adjustment factors[18] are introduced in the calculation (Global Canopy 2008).

The procedures to establish reference levels need also to be defined. The work may be entrusted with the national governments and their experts but due to complexities involved, risk for inflating REDD reductions (unduly low reference levels) and need for transparency, other options have been proposed which may include e.g. negotiation among experts under the framework of UNFCCC and COP endorsement of the outcome through a phased process (Angelsen et al. 2009).

Stakeholder views on the REDD reference levels may be summarized as follows:[19]

Commonalities

- National level reference levels are needed
- Sub-national reference levels can be useful

Divergences

- Can projected reference levels be applied (in addition to historic trends)?
- Who should establish the reference level?

Fracture lines

- Should global reference levels be part of the REDD financing mechanism

Lack of explicit views

- Procedures of establishing reference levels and periods

6. Eligible Activities, Measurement, Reporting and Verification

Eligible activities for REDD are closely related to how deforestation and forest degradation are defined. The Marrakesh Accords definition of forest allows flexibility for countries to define within certain limits what constitutes a forest and what additional areas (e.g. those covered by agroforestry activities) can be included in A/R under the CDM.

[18] E.g. "development adjustment factor" to address different levels of development between countries. See also footnote 13.

[19] Largely based on Global Canopy Programme (2008).

A key concern appears to be whether REDD financing could directly or indirectly promote undue land conversion and in particular for industrial treeplantations. If deemed desirable, this risk could be addressed in the REDD rules by e.g. excluding such plantations from the national definitions of forest. On the other hand, it needs to be recognized that planting trees is often necessary for renewal of forests and enhancing carbon stocks in existing forests. A related aspect is that the CDM allows expansion of forest carbon stocks through conversion of non-forest land into forest by Afforestation/Reforestation activities.

Deforestation and forest degradation are linked but different concepts (Box 1). While there is a common clear understanding on what is deforestation, only a generic agreed definition has been developed forest degradation[20] but it is not operational (FAO 2002). ITTO defined forest degradation as the long-term reduction in the capacity of a site to supply forest benefits, these may include wood, biodiversity and all other products or services (ITTO 2002). A degraded forest delivers a reduced supply of goods and services (including carbon sequestration) from the given site and maintains only limited biological diversity. It has lost the structure, function, species composition and/or productivity and carbon stocks normally associated with the natural forest type expected at that site.

Box 1: Decoupling degradation from deforestation

Degradation is often considered to be a precursor to deforestation (land-use change), and conceptualized as part of the same process; therefore it has been grouped closely with deforestation in UNFCCC documentation on REDD. But while it is true that in some cases degradation is followed by full deforestation, this is the *exception* rather than the rule. For example, it has been observed in the Brazilian Amazon and the Congo Basin that commercial logging (as the degradation driver) may be followed by agricultural clearance as migrant farmers move in along the logging roads. In many other places, and in other types of forest, degradation is not caused by commercial logging at all, but by extraction of various forest products, often for subsistence or local marketing (timber, firewood, charcoal, fodder) or by patchy clearance and re-growth associated with shifting agriculture, by forest dwellers and indigenous communities. In such areas degradation very rarely leads to deforestation – but to a gradual loss of carbon stocks.

The drivers behind deforestation and degradation are not, in most cases, the same, and neither are the actors. Most deforestation is caused by large scale commercial conversion of forest for agriculture or ranching, expansion of urban areas, infrastructure development and, some of which is 'governed' (sanctioned by government authorities) and some of which is 'ungoverned'. Most degradation on the other hand is the result of unsustainable extraction of forest products and values by local populations as part of their livelihood strategies. The area affected as such is about 850 million ha. The exception to this is commercial selective logging in humid forests, but this affects a smaller area in comparison to other forms of degradation (about 120 million ha (ITTO 2002). Dry and deciduous forests in the tropics are particularly affected by degradation due to unsustainable local uses, because their population densities are higher than the humid forests (Campbell et al. 2008), and these are growing.

Since the actors and processes are different, it follows that in general, different strategies and programmes may be needed under REDD to deal with deforestation as compared with degradation. Moreover, while curbing of deforestation results in reduced emissions, curbing of degradation results not only in reduced emissions but in most cases also in increases in forest biomass. This is because programmes to deal with degradation tend in practice to focus on improved management methods, e.g. ecological restoration. In other words, to deal effectively with many types of degradation, it is important to see them not as the beginning of a deforestation processes but as a form of poor forest management, which needs to be improved.

Source: Blaser, Robledo & Skutch (2009)

[20] "*Forest degradation is the reduction of the capacity of a forest to provide goods and services"* (FAO 2002).

From the carbon emissions perspective degradation has been interpreted as reduction of carbon stock and the IPCC Good Practice Guide provides agreed approaches and methods for accounting for changes in carbon stocks in the use and management of all forestlands. In order to not exclude short-term changes in the forest growing stock which are part of sustainable forest management interventions, IPCC has defined degradation incorporating the 'long-term' aspect[21]. This approach would avoid the difficult question on how to define what is degraded forest. Other operational definitions on forest degradation may be elaborated for specific purposes (e.g. for biodiversity or soil and water conservation).

Some stakeholders do not share the notion of inclusion of 'long-term' as they insist on any (incl. short-term) reduction in the growing stock to be considered degradation. This may have two possible motives: (i) use all REDD forests for conservation only (no timber harvesting), and (ii) reduction of illegal logging. Such an approach would obviously be detrimental for the economic benefits of the forest sector in developing countries.

Monitoring can be based on data collected from a variety of sources through a range of methods. Two components are involved (i) forest are and (ii) carbon stock in the forest; it is the latter which represents biggest challenges.

Five carbon pools have been identified by IPCC (2003)[22] but their measurement in developing countries is a major challenge. Therefore IPCC provided three tiers for carbon accounting allowing starting estimation with limited data and progressing towards a comprehensive assessment.[23]

Average carbon stocks per unit area (carbon density above ground) can be estimated by (i) stock-difference method comparing inventory data in two points of time, and (ii) gain-loss methods based on periodic growth estimates of the growing stock and data/estimates on periodic due to timber harvesting, fuelwood collection, forest fire, etc. These methods have their strengths and weaknesses (Angelsen 2008). As these methods are practised at present, they are limited to measure aboveground biomass only.

The credibility of REDD financing mechanisms relies on the robustness of the information on achieving the targeted objectives of climate change mitigation. In view of the scientific complexities and weaknesses in the existing data, third-party verification is deemed necessary. It could be carried out as part of the verification of the countries' overall annual GHG emission reporting, or as a specific REDD verification process (Angelsen et al. 2009). Part of the robustness of the monitoring system is to be able to detect leakage within a country and between countries.

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[21] *"A direct human-induced long-term loss (persisting for X years or more) of at least Y% of forest carbon stocks [and forest values] since time T and not qualifying as deforestation or an elected activity under Article 3.4 of the Kyoto Protocol" (*IPCC 2003)..However, thresholds for an area, time period and carbon loss percentage have not been agreed upon in order to operationalize this definition..

[22] Aboveground biomass, belowground biomass, litter, deadwood and soil organic carbon.

[23] Tier 1: default emission factors applied for data collected nationally or globally; Tier 2 applying country specific emission factors and activity data, and Tier 3 applying methods, models and inventory measurement systems that are repeated over time, driven by high resolution activity data and disaggregated subnationally at a fine scale (IPCC 2003).

Stakeholder views on of REDD activities, measurement, reporting and verification may be summarized as follows:

Commonalities

- Agreed forest definition under the Marrakesh Accords
- Accurate and comparable measurement and verification are needed
- Phased approach to build up country capability for measurement and monitoring
- Allowance for options in measurement
- Need to monitor leakage at national level

Divergences (potential)

- National level interpretation of the UNFCCC forest definition
- Temporary reduction of the (aboveground) carbon stock
- Application of the three tiers in national conditions

Fracture lines

- How to handle industrial plantations in the overall forest mitigation framework
- Operationalisation of the definition of forest degradation for REDD

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Abbreviations and Acronyms Related to REDD

AAU	Assigned Amount Unit
AFOLU	Agriculture, Forestry and Land Use change
AIJ	Activities Implemented Jointly
BAU	Business As Usual
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO2	Carbon dioxide
CO2-e	Carbon dioxide equivalent
COP	Conference of the Parties
DAF	Development Adjustment Factor
°C	Degree Celsius
ER	Emission reduction
ES	Ecosystem service
ETS	Emission Trading Scheme
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FLEGT	Forest Law Enforcement Governance and Trade
FRA	Global Forest Resources Assessment (FAO)
FT	Forest Transition
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GOFC-GOLD	Global Observation of Forest and Land Cover Dynamics
GPG	Good Practice Guidance
HFHD	High Forest Cover with High Rates of Deforestation
HFLD	High Forest Cover with Low Rates of Deforestation
ILO	International Labor Organization
IPCC	Intergovernmental Panel on Climate Change
IPES	International Payments for Ecosystem Services
IP	Indigenous People
ITTO	International Tropical Timber Organization
JI	Joint Implementation
LCs	Local Communities
LFHD	Low Forest Cover with High Rates of Deforestation
LFLD	Low Forest Cover with Low Rates of Deforestation
LULUCF	Land Use, Land Use Change and Forestry
MLF	Multilateral Fund
MRV	Monitoring, Reporting, and Verification
NAMA	Nationally Appropriate Mitigation Action
NGO	Non-governmental Organization
NHD	National Historical Deforestation
ODA	Official Development Assistance
PAMs	Policies and Measures
OTC	Over-the-Counter market
PES	Payments for Environmental Services
QELRCs	Quantified Emission Limitation and Reduction Commitments
QELROs	Quantified Emission Limitation and Reduction Objectives
RED	Reducing Emissions from Deforestation
REDD	Reduced Emissions from Deforestation and Forest Degradation

RER	Reference Emission Rate
RL	Reference Line/Level
R-PIN	Readiness Plan Idea Note
RS	Reference Scenario
SBSTA	Subsidiary Body for Scientific and Technological Advice
SFM	Sustainable Forest Management
tCO2-e	Ton of carbon dioxide equivalent
TDERM	Tropical Deforestation Emissions Reduction Mechanism
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries

GLOSSARY OF TERMS

Note: The explanation of the terms in this glossary is aimed at facilitating the first scoping TFD dialogue on REDD financing. As much as possible agreed texts have been used as a basis. On many terms, other explanations than those given may exist. Many definitions have been derived (or adapted) from Angelsen et al. (2009) and Green Capony Porgramme (2008).

Additionality

Measurable, long-term greehhouse gas (GHG) emission reductions and/or removal enhancements that would not have occurred in the absence of a particular project, policy, or activity.

Note: A programme of activity (PoA) is additional if it can be demonstrated that in the absence of the CDM (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that noncompliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy /regulation. This shall constitute the demonstration of additionality of the PoA as a whole.

Afforestation

As defined in the Marrakech Accords, direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding, and/or the human-induced promotion of natural seed sources.

Annex I Parties

The industrialized countries listed in Annex I to the UNFCCC that were committed to return their greenhouse-gas emissions to 1990 levels by the year 2000 as per Article 4.2 (a) and (b). Annex I Parties have also accepted emissions targets for the period 2008–12 as per Article 3 and Annex B of the Kyoto Protocol.

Business as Usual (BAU) baseline

A BAU baseline represents a projection of what would happen without an intervention, and in this instance serves as a benchmark to measure the impact of REDD actions.

Bali Action Plan

In December 2007, in Bali, the 13th Conference of the Parties to the UNFCCC adopted the Bali Action Plan describing a two-year process to finalize an agreed outcome in 2009 in Denmark (UNFCCC Decision 1/CP.13). In the Bali Action Plan, the Parties confirmed their commitment to address the global climate challenge by including, *inter alia*, policy approaches and positive incentives on issues related to REDD.

Cap and trade

An emission trading system wherein an international or national regulator establishes an overall cap on emissions, issues emission units or rights, and allows the transfer and acquisition of such rights.

Carbon market

Any market that creates and transfers carbon emission units or rights.

Carbon pool

A reservoir that has the capacity to accumulate or release carbon. The Marrakech Accords provide that all changes in the following carbon pools shall be accounted for: aboveground biomass, belowground biomass, litter, dead wood, and soil organic carbon; it also provides that a given pool may be ignored if transparent and verifiable information is provided that the pool is not a source. The units are mass (e.g., t C).

Carbon sequestration

The removal of carbon from the atmosphere and long-term storage in sinks, such as marine or terrestrial ecosystems such as forests.

Carbon stock

The mass of carbon contained in a carbon pool at a specified time.

Certified Emission Reduction (CER)

A unit of GHG reductions issued under the Clean Development Mechanism. One CER equals one metric ton of CO_2 equivalent, calculated using global warming potentials recommended by the Intergovernmental Panel on Climate Change (IPCC) and approved by the COP.

Clean Development Mechanism (CDM)

A mechanism established in Article 12 of the Kyoto Protocol and designed to assist non-Annex I Parties in achieving sustainable development and in contributing to the ultimate objective of the UNFCCC, and to assist Annex I Parties in achieving compliance with their quantified emission limitation and reduction commitments.

Compliance-grade MRV

A monitoring, reporting and verification (MRV) process that ensures reliable climate benefit associated with real and measurable emission reductions and enhancement of removals (quantified in tons of CO_2equivalent).

Crediting baseline

A crediting baseline is the reference level against which climate benefits are measured and financial incentives rewarded.

Deforestation

Deforestation, as defined by the Marrakech Accords, is the direct human-induced conversion of forested land to non-forested land.

Deforestation as defined by the FAO is "the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10 percent threshold".

Degradation

A definition for forest degradation has not yet been agreed upon. The CPF Expert Meeting (2002) agreed upon the following generic definition: Forest degradation is the reduction of the capacity of a forest to provide goods and services.

'Capacity' includes the maintenance of ecosystem structure, functions and carbon stocks.

IPCC has defined forest degradation as a direct human-induced long-term loss (persisting for X years or more) of at least Y% of forest carbon stocks [and forest values] since time T and not qualifying as deforestation or an elected activity under Article 3.4 of the Kyoto Protocol" (IPCC 2003). However, thresholds for an area, time period and carbon loss percentage have not been agreed upon in order to operationalise this definition.

With respect to REDD, degradation refers specifically to a reduction in carbon density.

Forest

According to the Marrakesh Accords a forest is defined as a minimum area of land of 0.05-1 hectares with tree crown cover (or equivalent stocking level) of more than 10-30 percent with trees with the potential to reach a minimum height of 2-5 metres at maturity in situ. Actual definitions can vary from country to country as the Kyoto Protocol permits countries to specify the precise definition within these parameters to be used for national accounting of emissions.

Forest Carbon Partnership Facility (FCPF)

The FCPF is a World Bank program created to assist developing countries in their efforts to reduce emissions from deforestation and land degradation. Objectives include capacity building for REDD activities in developing countries and testing a program of performance-based incentive payments in some pilot countries.

Forest restoration

A management strategy applied in degraded (primary) forest areas. Forest restoration aims to restore the forest to its state before degradation (same functions, structure and composition. In terms of mitigating climate change, forest restoration becomes complementary to reducing emissions from reducing forest degradation. (ITTO 2002)

Fungible

Being of such a nature that one part or quantity may be replaced by another equal part or quantity in the satisfaction of an obligation.

Fungibility is the degree of exchangeability between REDD units and other units traded in carbon markets. When REDD units are fully fungible, they can be sold, banked, and used for compliance with greenhouse gas emission reduction objectives without restrictions. In the REDD context the fungibility refers to a tonne of carbon dioxide equivalent (CO_2e).

Global additionality

The sum of REDD countries' reference levels cannot exceed the calculated global historical deforestation rate or a percentage thereof.

Gross deforestation

Area deforested in a particular period and zone, not taking into account the area afforested/reforested or expanded through natural expansion of forest in the same period and zone.

Gross emissions

A method for estimating emissions from gross deforestation that does not include replacement vegetation.

Hot Air

Hot air often refers to emissions reductions that are not additional.

Indigenous people

There are no universally agreed international definitions of indigenous people, although the term has been defined in certain international legal instruments. According to the United Nations, the most useful approach is to identify, rather than define indigenous peoples. This is based on the fundamental criterion of self-identification as underlined in a number of human rights documents.

IPCC Good Practice Guidance [for Land Use, Landuse Change, and Forestry (LULUCF)]

A methodological report from the IPCC that provides supplementary methods and good practice guidance for estimating, measuring, monitoring, and reporting on carbon stock changes and greenhouse gas emissions from LULUCF activities under Article 3, paragraphs 3 and 4, and Articles 6 and 12 of the Kyoto Protocol.

The IPCC definition of *good practice*, endorsed by the UNFCCC COP as part of the Marrakech Accords, is a set of procedures intended to ensure that greenhouse gas inventories are accurate in the sense that they are systematically neither over- nor underestimated as far as can be judged, and that uncertainties are reduced as far as possible.

IPCC 1996 GL

A methodological report published in 1996 by the Intergovernmental Panel on Climate Change (IPCC) that provides guidelines for national greenhouse gas inventories. In accordance with Marrakech Accords, these methodologies shall be the basis for national GHG inventories prepared for the purpose of the Kyoto Protocol.

IPCC 2006 GL

A methodological report published in 2006 by the IPCC that provides guidelines for national greenhouse gas inventories. These updated methodologies have not yet been endorsed.

Joint Implementation (JI)

A mechanism under the Kyoto Protocol through which a developed country can receive "emissions reduction units" when it helps to finance projects that reduce net greenhouse-gas emissions in another developed country (in practice, the recipient state is likely to be a country with an "economy in transition"). An Annex I Party must meet specific eligibility requirements to participate in joint implementation.

Kyoto Protocol

A protocol adopted in 1997 under the UNFCCC. The Kyoto Protocol, among other things, sets binding targets for the reduction of greenhousegas emissions by Annex I countries. The first commitment period of the Kyoto Protocol is 2008-2012.

Leakage

GHG emissions displacement that occurs when interventions to reduce emissions in one geographical area (subnational or national) cause an increase in emissions in another area through the relocation of activities.

Under the CDM leakage is defined as the net change of anthropogenic emissions by sources of greenhouse gases (GHG) which occurs outside the project boundary, and which is measurable and attributable to the CDM project activity.

Local communities

There is no universally agreed international definition of local communities, although the term has been defined in certain international legal instruments. With respect to a particular activity commonly the term refers to communities within the activity's area of influence.

Marrakech Accords

Agreements reached at COP-7 that set various rules for "operating" the more complex provisions of the Kyoto Protocol. Among other things, the accords include details for establishing a greenhouse gas emissions trading system, implementing and monitoring the Protocol's Clean Development Mechanism, and setting up and operating three funds to support efforts to adapt to climate change.

Mitigation

In the context of climate change, a human intervention to reduce the sources of emissions or enhance the sinks of greenhouse gases.

Net deforestation

Reduction of forest area during a specified time period.

Net REDD emissions

For REDD, a method for estimating emissions from gross deforestation that considers both the carbon stocks of the forest being cleared and the carbon stock of the replacement land use.

Non-Annex I Parties

All countries that are not listed in Annex I to the UNFCCC or the Kyoto Protocol. Most developing countries are Non-Annex I Parties.

OSIRIS

The Open Source Impacts of REDD Incentives Spreadsheet (OSIRIS) is a simulation model used to project impacts of various proposed REDD mechanisms.

PAMs (Policies and Measures)

For REDD, nationally enacted sets of policies and actions that countries undertake to reduce emissions or increase removals.

Participation

For REDD, inclusion in key processes, *inter alia*, decision making, implementation, benefits sharing, and evaluation.

Performance-based remuneration
An incentive system wherein the international contribution to support REDD implementation is contingent on meeting pre-agreed benchmarks.

Permanence
The longevity of a carbon pool and the stability of its stocks, given the management and disturbance environment in which it occurs.

Performance metric
A set of indicators and benchmarks against which REDD actions and activities are evaluated, including but not limited to emissions and removals against reference levels.

Preexisting national efforts
Actions carried out by a REDD participant country before it formally engages in an international REDD process.

Principle of conservativeness
Justification for intentional underestimation of emissions reductions and/or removal enhancements to reduce risk of overestimation, employed when completeness, accuracy, and precision cannot be achieved.

Readiness
REDD country actions including a process of policy design, consultation and consensus building, and testing and evaluation for a REDD national strategy, prior to scaled-up REDD implementation.

REDD focal point
Authority or function in a REDD participant country that serves as a focal point for communication within the country and between national and international actors.

REDD implementation plan
A document that details operationalization of national REDD strategies and can serve as a request for international funding.

REDD national strategy
A REDD strategy summarizes the policy actions a country plans to take to implement REDD. The REDD strategy reflects the commitment obtained from key actors at the country level in the design of low-carbon development strategies and the adoption of a new land-use paradigm.

REDD plus
The comprehensive approach to REDD provided by COP-13 Decision 2/CP.13.

REDD registry
A potential future international registry for the issuance of approved REDD units that could be structured similar to the CDM registry and be managed by the UNFCCC secretariat.

REDD units
A REDD unit that is created via REDD activity

Reference level
A reference level is synonymous with a crediting baseline for providing incentives for a participating REDD country if emissions are below that level.

Reforestation
According to the Marrakech Accords, the direct human-induced conversion of non-forested land to forested land through planting, seeding, and/ or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989.

Reverse leakage (or positive leakage)

A mitigation activity that results in emissions reduction in areas outside the original mitigation area.

Sequestration

The process of increasing the carbon content of a carbon pool other than the atmosphere.

Sink

A pool (reservoir) that absorbs or takes up carbon released from other components of the carbon cycle, with more carbon being absorbed than released.

Any process or mechanism which removes a greenhouse gas, an aerosol, or a precursor of a greenhouse gas from the atmosphere. A given pool (reservoir) can be a sink for atmospheric carbon if, during a given time interval, more carbon is flowing into it than is flowing out.

Source

A pool (reservoir) that absorbs or takes up carbon released from other components of the carbon cycle, with more carbon being released than absorbed.

Source is opposite of sink.

Subnational activity

Activities implemented at the subnational level as part of a country's REDD strategy. Subnational activities can be implemented by governments, local authorities, NGOs, or private entities. They may be embedded in a national or international crediting mechanism.

Tier level

Applying the IPCC Good Practice Guidance LULUCF, countries are provided with options to estimate GHG emissions. Tiers represent levels of methodological complexity where Tier 1 is the most basic estimation methodology, Tier 2 is intermediate, and Tier 3 is most demanding in terms of complexity and data requirements.

UNDRIP

UN Declaration on the Rights of Indigenous Peoples. A comprehensive statement addressing the human rights of indigenous peoples, adopted at the UN General Assembly in 2007, with 144 countries voting in support, 4 voting against, and 11 abstaining. It is a non-legally binding instrument.

UN REDD

A Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, the UN-REDD Program brings together the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP) in the development of a multi-donor trust fund (established July 2008) that allows donors to pool resources and provides funding to activities of this programme.

Verification

Independent third-party assessment of the expected or actual emission reductions of a particular mitigation activity.

Voluntary Carbon Standards

Certification schemes for emission credits not regulated under the Kyoto Protocol.

ANNEX 1

COUNTRY ELIGIBILITY CRITERIA AND REDD FINANCING OPTIONS

Scope of the Analysis

Country eligibility criteria in REDD financing define to what extent the forest mitigation potential of forests can be tapped. These criteria will also have implications for other environmental services than climate benefits, social and economic development, and equity between countries. E.g., low forest cover (LF) countries and countries which have already addressed deforestation, such as high forest cover countries with low deforestation rates (HFLD) may have limited possibilities to access to REDD financing which may mainly benefit high forest cover countries with high deforestation rates (HFHD).

These HFHD countries are mostly middle income countries and they are already the principal beneficiaries of the existing external funding flows to forests, albeit not to a required extent for achieving SFM. Tapping the full potential of forests for climate change mitigation would require instruments which can make countries with different forest conditions eligible for financing.

An effort has been made to explore implications of two key factors which have been discussed as possible country eligibility criteria, i.e. deforestation rate and degree of forest cover in the country[24]. There are no agreed definitions for what is low and high deforestation rate. In this case countries were divided into three groups according to their deforestation rate as follows[25]:

- High deforestation countries with a deforestation rate of 0.5% per year or more
- Low deforestation countries with a deforestation rate of less than 0.5% per year
- Other countries where forest area has remained stable or increase (deforestation rate 0 or negative

The deforestation rate refers to net deforestation rate (annual change of forest cover) in 2000-2005 as reported in the FAO Global Forest Resources Assessment (FRA) 2005 (FAO 2005). From the carbon emission perspective, it would have been more logical to use gross deforestation as the basis but the country-level data is not available. In order to illustrate the importance of this factor, it is noted that the global net deforestation has been 7.5 million ha per year. The underlying components for this change are: (i) (gross) deforestation, i.e. all the forest cover which has been lost during the period, (ii) afforestation and reforestation on lands which were not forest in the beginning of the period, and (iii) natural expansion of forest area during the period. The gross rate of global deforestation according to FRA is about 13 mill ha/year. Plantations are estimated to have increased by 2.8 mill. ha/year, leaving 5.5 million ha for other factors.

For an assessment of REDD options, the impact analysis should use gross deforestation as it is the source of emissions. However, gross deforestation rates are not reported in the FRA.[26] Therefore, any conclusions to be made based on the data in this annex should be used with caution. The problem is probably particularly serious in the large countries which have both large annual (gross) deforestation area and large annual forest expansion area (like Brazil or Indonesia). In countries where expansion of forest area is not significant, there is less source of error. Further analysis on country level should be carried out to improve the available data.

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[24] The analysis is presented in Simula 2008.

[25] da Fonseca et al. (2008) used 0.22% per year to differentiate high and low deforestation rates and did not include countries with zero deforestation or increasing forest area.

[26] We cannot even make a (partial) correction in the FRA net figures based on the data on rate of forest planting because planted forest has been established both on previously forested land and on bare land.

Classification according to the degree of forest cover is also problematic as there are no agreed definitions with thresholds for what is low or high forest cover country. Therefore, four categories were adopted for forest cover groups applying 20% intervals: less than 20%, 20-40%, 40-60% and higher than 60% of the total area of the country. In the following analysis, only two groups are discussed for simplicity: (i) high forest cover countries (more than 40%) and (ii) low forest cover countries (less than 40%) but the details by groups are given in Table 1.A.

A total of 156 countries were included in the analysis. The resulting deforestation rate-forest cover matrices were calculated for five indicators:

- Number of countries
- Total forest area of the countries in the group
- Total deforestation area (net) of the countries in the group
- Forest carbon stock of the countries in the group
- Total rural population of the countries in the group

For carbon emissions deforestation area is used as a proxy, for sustainable forest management for enhanced carbon sequestration both total forest area and forest carbon stock are used, and for social impacts the total rural population is used as a proxy.

It goes without saying that this is a very preliminary assessment on some aspects of possible country eligibility criteria and the work should be further expanded with additional indicators and more data. Therefore, the following results are no more than indicative by nature.

The elaborated statistical data allows some tentative conclusions on possible country eligibility criteria with regard to REDD and SFM in the existing forests. However, the data did not allow similar assessment on the potential implications of inclusion of forest restoration, and afforestation in the financing scheme.

Implications of Criteria Related to Deforestation Rate and Forest Cover

Deforestation Rate

If only high deforestation rate (0.5%/yr or more) countries are included in the financing schemes, it would have the following implications:

- Only about one third of the developing countries would have access to funding.
- Most of the annual deforestation area (90%) in developing countries would be covered by the scheme, i.e. 11.2 million hectares per year
- These countries have a total forest area of 1.1 billion ha accounting for more than half of the total forest area (53%) of the 156 countries.
- These countries have a total carbon stock of 93.8 billion tCO2 accounting for more than half of total carbon stock of all the countries in the analysis. This forest carbon stock could be managed for enhancement of carbon sequestration through their sustainable management.
- These countries account for about a quarter of the total rural population of the countries included in the analysis corresponding to about 738 million people.

If low deforestation rate (less 0.5/yr) countries are included in the financing schemes, it would have the following implications:

- Twenty-two more countries would be included in the financing scheme.

- Another 1.3 million hectares of forest lost per year due to deforestation could be covered by the scheme.
- Another 560 million hectares of forest area could be eligible SFM for carbon enhancement with a total carbon stock of 60.5 billion tCO2.
- Another 321 million rural people are found in these countries

If the other countries with zero net deforestation rate or countries where forest area is increasing, are included in the financing scheme:

- Further 443 million ha of forest land could be included with a carbon stock of 30 billion tCO2 for enhancement of carbon sequestration
- In these countries there are another 1.9 billion rural people

Degree of Forest Cover

In this context we consider only two groups; (i) countries with a forest cover of higher than 40% of the total land area, and (ii) countries with forest cover of 40% or less. If only the high forest cover countries are included in the financing scheme

- 48 countries could participate
- Their total annual deforestation is 8.7 million ha/year or about 70% of the total deforestation area
- Their total forest area is 1.3 billion ha or about 60% of the total of all the 156 countries
- These forests have a total carbon stock of about 135 billion tCO2 (70% of the total)
- These countries house 39 million rural people or 11% of the total of all the countries included

If the countries with low forest cover (forest cover 40% or less) are included in the financing scheme

- 108 countries more countries would be included
- Their total forest area is about 840 million hectares which could be integrated in the scheme for enhancement of existing carbon stock through SFM
- The existing carbon stock of these forests is about 49 billion tCO2 which could be thereby significantly increased.
- The possibility of access by these countries to REDD would be limited as their deforestation rate is usually low and in many countries the forest area is expanding.
- These countries have a very large potential for increasing carbon sequestration through afforestation and reforestation as they tend to have large areas of marginal lands which are not used for other purposes and these lands are often degraded.
- These countries have a total rural population of 2.6 billion or almost 90% of the total of all the 156 countries included.

The above analysis is exploratory and suffers from many weaknesses. However, it shows that if a forest financing scheme is applied only for high deforestation high forest cover countries, huge opportunities to use forests for climate change mitigation are missed. These 24 countries account for

- Only two thirds of the total deforestation area
- Only about 40% of the total forest area and the total forest carbon stock which could be used for carbon sink enhancement through sustainable forest management
- Only 8.6% of the total rural population of the 156 countries included in the analysis

Table 1.A Forest Area, Deforestation, Forest Carbon Stock and Rural Population by Country Groups

Forest cover groups	Annual deforestation rate			
	Above 0.5%	Less than 0.5%	0 or increase	Total
Number of Countries by Country Group				
< 20 %	19	6	40	65
20-40%	15	7	21	43
40-60%	18	6	4	28
>60%	6	3	11	20
Total	**58**	**22**	**76**	**156**
Total Forest Area by Forest Cover Country Group (million ha)				
< 20 %	73.65	42.31	77.68	193.64
20-40%	183.66	140.75	324.09	648.50
40-60%	842.45	326.70	6.05	1,175.20
>60%	49.87	50.51	35.10	135.48
Total	**1,149.63**	**560.27**	**442.91**	**2,152.82**
Total Deforestation Area by Forest Cover Country Group (million ha per year)				
< 20 %	-1.12	-0.17	0.07	-1.22
20-40%	-2.05	-0.46	4.48	1.98
40-60%	-7.80	-0.59	0.01	-8.38
>60%	-0.27	-0.03	0.01	-0.29
Total	**-11.23**	**-1.26**	**4.57**	**-7.92**
Total Forest Carbon Stock by Country Group ($GtCO_2$)				
< 20 %	4.18	3.23	3.82	11.23
20-40%	12.48	8.20	16.93	37.61
40-60%	75.38	39.74	0.43	115.55
>60%	1.73	9.31	8.68	19.72
Total	**93.76**	**60.48**	**29.87**	**184.11**
Total Rural Population by Country Group (million)				
< 20 %	323.3	139.1	239.0	701.3
20-40%	159.3	105.9	1,664.2	1,929.3
40-60%	244.5	65.1	5.2	314.8
>60%	11.1	11.4	1.8	24.2
Total	**738.1**	**321.4**	**1,910.1**	**2,969.7**

Explanatory notes:

- The table is calculated based on data in FAO Global Forest Resources Assessment 2005. For forest area and forest carbon stock, the data refers to year 2005; the annual deforestation rate is calculated for the period of 2000 to 2005; and the rural population data is for 2004.
- Deforestation rate is calculated based on the change of forest cover between 2000 and 2005. It is a net measure as it also incorporates afforestation/reforestation on previously non-forest land and natural expansion of forest. The actual total deforestation rate is therefore higher than the above figures indicate.
- Deforestation rate categories (above or equal to 0.5%/yr and less than 0.5% per year) have been arbitrarily established in the absence of agreed definitions of high and low deforestation countries.
- Forest cover groups have also been arbitrarily established in the absence of common definitions (e.g. for low forest cover countries or high forest cover countries).

- The data on carbon stock includes carbon in above-ground and below-ground biomass as well as carbon in dead wood.