

Reducing Emissions from Deforestation and Forest Degradation (REDD): An Options Assessment Report

Prepared for
The Government of Norway



Meridian Institute

Connecting People to Solve Problems

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Preface

The Government of Norway has made the inclusion of a mechanism for reducing emissions from deforestation and forest degradation (REDD) in a post-2012 climate regime a policy priority in the United Nations Framework Convention on Climate Change (UNFCCC) process. To achieve this, sufficient fact-based analysis of options on how to effectively reduce emissions from deforestation and forest degradation and impacts of an agreed mechanism will be crucial. This report is one, important contribution in that regard.

The Meridian Institute, a nonprofit NGO internationally recognized for convening and facilitating neutral and independent dialogues and assessments, in our view was the ideal facilitator of this process. The Institute has assembled a high-quality, diverse, and independent group of experts to provide pragmatic, fact-based analysis and assessments of a set of proposed options for critical elements of the REDD component of a Copenhagen agreement. We wish to thank the Meridian Institute and the analyst group for their efforts. We are also grateful to the David and Lucile Packard Foundation for assisting with the up-front costs of the assessment.

There have been extensive consultations as part of this effort—with governments, civil society, indigenous peoples' representatives, and other key stakeholders—to ensure that all key perspectives are considered. However, the intent of this process has not been to reach or form consensus, but rather to provide an analytically driven effort to produce additional substantial insights regarding the impacts of potential REDD mechanisms.

We feel that this report will be a valuable contribution to the “global public good” of substantial insights regarding a REDD mechanism, and hope that others—both in and out of government—will also find it useful.



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We note that these individuals were asked for input on the scope and contents of this report, but were not asked to seek consensus or to endorse any of the views expressed, for which the authors are solely responsible.

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Executive Summary

The Bali Road Map should lead to a Copenhagen agreement that commits to climate stabilization at a maximum 2°C temperature increase, consistent with atmospheric CO₂ concentrations below 450 parts per million (ppm). Reducing emissions from deforestation and forest degradation (REDD) will address a source of greenhouse gas (GHG) emissions larger than the entire global transportation sector. Without REDD, the 2°C climate stabilization goal will not be reached.

This report assesses several important considerations for a future REDD mechanism within the UNFCCC, and strives to clarify and inform some of the critical choices that will need to be made about including REDD in a Copenhagen agreement.¹ At the international level, a good outcome for REDD would create the enabling conditions for effective implementation in REDD countries, including:

- Financial incentives, (Chapter 2);
- Procedures for setting reference levels (Chapter 3);
- Methodologies for monitoring, reporting, and verification (MRV – Chapter 4); and
- Processes to promote the participation of indigenous peoples and local communities (Chapter 5).

Capturing the mitigation potential of REDD requires a flexible, phased approach to implementation in order to accommodate (i) the diverse capabilities of REDD countries; (ii) an expanded scope of REDD to include conservation, sustainable management of forests, and enhancement of forest carbon stocks;² and (iii) the near-term constraints of the current global financial crisis.

Phase 1: National REDD strategy development, including national dialogue, institutional strengthening, and demonstration activities. These activities should continue to be supported by voluntary contributions that

¹ The scope of the report is necessarily limited, and there has been no attempt at comprehensive review of every REDD issue, proposal, or option. A number of important and challenging issues relevant to REDD implementation are not discussed herein, including country-specific approaches to readiness, nationally appropriate REDD strategies, and the promotion of sustainable consumption patterns in industrialized countries. Consultations and written reviews including individuals from governments, indigenous peoples organizations, and NGOs involved in REDD negotiations were conducted to solicit input on the scope and contents of this report, but not to seek consensus. Those consulted have in no way endorsed the contents of this report, for which the authors are solely responsible.

² Decision CP.13 Bali Action Plan.

are immediately available, such as those administered through the World Bank's Forest Carbon Partnership Facility (FCPF), UN REDD, and other bilateral arrangements. Eligibility for access to funds should be based on a demonstrated national commitment to REDD strategy development.

Phase 2: Implementation of policies and measures (PAMs) proposed in those national REDD strategies. These activities should be supported by predictable funding from a global facility supported by an internationally binding finance instrument with enforceable commitments, such as assigned amount units (AAU) auctioning revenue. Eligibility for access to those funds should be based on a demonstrated national commitment to REDD strategy implementation, with continued access based on performance including proxy indicators of emission reductions and/or removal enhancements (e.g., reduction in area deforested). Once the financial instrument for Phase 2 has been established, most Phase 1 activities could be incorporated into the Phase 2 instrument.

Phase 3: Payment for performance on the basis of quantified forest emissions and removals against agreed reference levels. This could be financed on a large scale by the sale of REDD units within global compliance markets or a non-market compliance mechanism, with eligibility contingent upon compliance-grade monitoring, reporting, and verification (MRV) and accounting of emissions and removals. No Phase 3 REDD units should be earned for emission reductions or enhanced removals achieved during Phase 2, but Phase 3 should allow crediting for the results of the continuation of policies and measures initiated in Phase 2.

The timing of graduations from one phase to the next will vary, and REDD countries could skip a particular phase provided they meet the eligibility criteria for the next phase. Within countries, overlap between phases may also be necessary and even desirable. MRV should advance progressively with phase graduation, and should be upwardly compatible with a future framework that could encompass the whole agriculture, forestry, and other land uses (AFOLU) sector of Intergovernmental Panel on Climate Change (IPCC)

guidelines for GHG inventories. Although participation in a REDD mechanism would be voluntary, liability for participating countries would increase from one phase to the next, with an eventual national sectoral commitment in Phase 3.

Options for REDD Finance: International REDD funding will have to be integrated into the overall financing architecture developed under the UNFCCC as part of a Copenhagen agreement. 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 REDD countries in accordance with their respective capabilities, taking into account preexisting national efforts and expenditures in sustainable forest management, forest protection, and forest inventories.

A central principle of REDD country progression through Phases 1, 2, and 3 is that the financial incentive should increase within and between phases, commensurate with demonstration of commitment and achievement of measurable and lasting emission reductions. Consistent with that principle, we suggest:

- Increased voluntary contributions to support Phase 1 activities, including those developed under the multilateral FCPF and UN REDD initiatives.
- Enforceable industrialized country commitment to Phase 2 REDD funding of a global facility to enable progress toward achieving a 50 percent reduction in global deforestation by 2020. We suggest a COP-level commitment to USD 2 bn/yr in 2010, increasing to USD 10 bn/yr in 2014. The global facility would finance REDD PAMs with continued funding dependent upon performance:
 - The facility would preferably be a single fund, but could also be a clearinghouse that coordinates diverse support streams.
 - Disbursement could be based either on five-year national REDD implementation plans and annual performance indicators, or left to the responsibility of a national decision-making process.
- A relatively swift opportunity for transition from Phase 2 to a compliance instrument in Phase 3, which is based on quantified GHG emission reductions and enhancements of removals:

- The transition opportunity should allow for flexible timing of REDD country entry, to accommodate the development of compliance-grade MRV.
- REDD units could be issued ex post after the environmental benefits have accrued, and been measured and verified (*sectoral baseline and credit*). Alternatively, REDD units could be issued ex ante based on an agreed reference level, wherein a country could sell REDD units to raise funds or allocate units to subnational actors. At the end of the crediting period the country would be liable to match emissions from the forest sector with REDD units (*sectoral cap and trade*).

Options for Setting Reference Levels:³ GHG-based compensation of REDD requires an agreement on country-specific emission reference levels, which have profound implications for the climate effectiveness, cost efficiency, and distribution of REDD funds among countries. The setting of reference levels involves tradeoffs between different interests and objectives, as illustrated by the equation:

$$\text{Total REDD funds} = \text{Net benefits to REDD countries (REDD rent)} + \text{real costs of REDD (opportunity + transaction costs)}.$$

Ambitious reference levels help to ensure that REDD rent is minimized and that REDD funds are used primarily to offset the opportunity costs of emission reductions, thereby maximizing global climate benefit. But because REDD rent represents the financial incentive for REDD countries to participate in the voluntary, international REDD mechanism, overly ambitious reference levels would discourage participation. We suggest:

- Procedures for setting reference levels that are based on agreed criteria across countries to avoid opportunistic establishment of national REDD reference levels.
- Adherence to a principle of global additionality that strives to ensure that REDD is contributing to a reduction in overall forest-related emissions relative to business as usual across countries.

³ This chapter focuses primarily on the deforestation component of REDD, for which methods are more advanced. Nonetheless, most of the principles discussed apply broadly to emissions and removals associated with changes in forest area and/or carbon density.

- Using historical deforestation rates as a point of departure for setting reference levels, with attentiveness to national circumstances including forest transition stage (forest cover) and income level (GDP per capita).
- Final determination of reference levels for REDD countries should be decided upon using a process analogous to that used for AFOLU reference levels for industrialized countries.

A quantitative analysis was employed to examine the climate effectiveness (overall emission reductions) and distributional implications of reference levels, giving different weights to historical national deforestation, forest cover, per capita GDP, and a global additionality scaling factor. In general, weighting of reference levels away from historical national deforestation and toward forest cover and per capita GDP criteria tends to reduce their climate effectiveness. A scaling factor that reduces the global reference level can increase climate effectiveness, particularly for high volumes of REDD funding.

Options for Monitoring, Reporting, and Verification:

A GHG-based instrument that rewards REDD on the basis of quantified emission reductions and/or removal enhancements requires agreement on standards for MRV. Most REDD countries will need enhanced capabilities in both current and evolving technologies in remote sensing and in methods for measuring and estimating carbon stocks in key pools. We suggest:

- Employing the Kyoto Protocol (Marrakech Accord) definition of forest and the IPCC framework for GHG inventories and Good Practice Guidance (GPG) for defining all eligible REDD activities included within the scope of the Bali Action Plan:
 - Requiring at least Tier 2-level monitoring to estimate net emissions from gross deforestation;
 - Promoting Tier 3 reporting along with increasing access to the necessary financial resources and technical capabilities needed for national monitoring systems;
- Flexibility and consistency with respect to the inclusion of diverse forest carbon pools in MRV⁴;

⁴ Consistent with the approaches for determining inclusion or exclusion of approved carbon pools in emission factor calculations in the land use, land-use change, and forestry (LULUCF) sector for Annex 1 countries, and for afforestation/reforestation in the CDM.

- Future reviewing of IPCC GPG methodologies to ensure applicability in response to the future REDD policy framework, including further development of internationally acceptable methods, guidance, and standards; and
- Adoption of the same verification process as used for reviewing annual GHG inventories of countries with an emission-reduction commitment.

Monitoring of forests remaining as forests (i.e., degradation, conservation, sustainable management of forests) is more challenging than monitoring deforestation. For some activities, the climate benefit is small relative to the cost of monitoring. The framework for accounting for the category “forests remaining as forests” is already outlined in IPCC 1996 Guidelines and 2003 GPG, and estimates net emissions or removals as the product of the area affected and the net change in C density. However, the existing methodologies do not cover all major aspects of C losses and gains associated with REDD. Overall, emission factors for activities associated with reducing emissions from degradation generally result in low climate benefits, are difficult to monitor in most cases, require high levels of local capacity, and currently have high monitoring costs. The application of new satellite techniques could help reduce these costs. Future review of IPCC GPG methodologies will be needed to ensure applicability in response to a future REDD policy framework, including further development of internationally acceptable methods, guidance, and standards.

Options for Promoting Effective Participation of Indigenous Peoples (IPs) and Local Communities (LCs):

The effective participation of IPs and LCs in a REDD mechanism and actions will influence environmental effectiveness. However, adopting strong provisions to promote participation in a Copenhagen agreement will be challenging. Within the UNFCCC, stringent rules on the recognition of the rights of IPs and LCs could be seen to be at odds with the national sovereignty rights of Parties.

The risks and opportunities that REDD may raise for IPs and LCs include, on the one hand, potential loss of access to land and other natural resources, and on the other hand, potentially increased resource flows to poor rural areas and improved forest governance. Effective

participation of IPs and LCs in REDD implementation would increase the likelihood that their risks will be mitigated and their opportunities enhanced.

Specific suggestions for promoting effective participation of IPs and LCs in REDD include:

- Promotion of the participation of IPs and LCs in an international REDD mechanism, *inter alia*, via:
 - Broad and inclusive reference to IPs and LCs;
 - Establishment of rights to be consulted, heard, and informed for those affected by international and national REDD actions, including access to an international review system that gives non-state actors the opportunity of recourse to an appeals body;
 - Provision of adequate resources to establish effective accountability systems and help overcome financial barriers to participation;
 - Representation of IPs and LCs on the governing body of a global REDD finance facility (Phase 2).
- Strengthening the national implementation of REDD, *inter alia*, via:
 - Formulation of guidelines to promote participation nationally; and
 - Support for key areas of national implementation, including land tenure reform, strengthening civil society organizations, involvement of local governments, and participation of IPs and LCs in MRV systems.

A sustainable outcome for REDD requires a global partnership, with REDD country leadership needed for successful implementation, including participation of IPs and LCs, and industrialized country leadership provided through deep domestic emission reductions and support for REDD actions.

Acronyms

AAUs	Assigned Amount Units
BAU	Business As Usual
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO ₂	Carbon dioxide
CO ₂ -e	Carbon dioxide equivalent
COP	Conference of the Parties to the UNFCCC
°C	Degree Celsius
ETS	Emission Trading Scheme
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility of the World Bank
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
IPs	Indigenous Peoples
IPCC	Intergovernmental Panel on Climate Change
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
MLF	Multilateral Fund
MRV	Monitoring, Reporting, and Verification
NAMAs	Nationally Appropriate Mitigation Actions
NGO	Nongovernmental Organization
NHD	National Historical Deforestation
ODA	Official Development Assistance
OSIRIS	Open Source Impacts of REDD Incentives Spreadsheet
PAMs	Policies and Measures
PES	Payments for Environmental Services
QELRCs	Quantified Emission Limitation and Reduction Commitments
QELROs	Quantified Emission Limitation and Reduction Objectives
REDD	Reduced Emissions from Deforestation and Forest Degradation
RLs	Reference Line/Levels
R-PIN	Readiness Plan Idea Note
SBSTA	Subsidiary Body for Scientific and Technological Advice
SFM	Sustainable Forest Management
tCO ₂ -e	Ton(s) of carbon dioxide equivalent
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

1. Introduction

Scientific understanding and public awareness of the enormity of the threat that climate change poses to humanity and to the world's ecosystems have grown rapidly during the past few years, accompanying the rate at which global changes now appear to be approaching their tipping points.⁵ The time available to address this global crisis is rapidly dwindling, and deep cuts in greenhouse gas (GHG) emissions are urgently needed now if we are to avoid the danger zone of a global temperature increase greater than two degrees celsius (2°C). Climate change mitigation will be neither cheap nor easy, but its cost and difficulty pale in comparison with the risks and costs that are likely to accompany failure to take decisive action.

Constraining global temperature increase to less than 2°C will depend upon keeping atmospheric CO₂ concentrations below 450 parts per million (ppm). Achieving that target will require rapid deployment of all major climate change mitigation strategies. Because deforestation accounts for about 18 percent of global GHG emissions—larger than the entire global transportation sector—reducing emissions from deforestation and forest degradation (REDD) has become a prominent potential mitigation strategy. The REDD concept is predicated on the assumption that forests will contribute to climate change mitigation only if their value increases to a level that makes protecting forests consistent with viable development strategies.

1.1 The Scope of REDD within the UNFCCC

At the end of 2007, the parties to the United Nations Framework Convention on Climate Change (UNFCCC) confirmed their commitment to address the global climate challenge through the *Bali Action Plan*⁶ and the *Bali Road Map*⁷ for an agreement to be completed at the Conference of the Parties (COP) to the UNFCCC in Copenhagen at the end of 2009. Their agreement includes reference to REDD, specifically 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)}.

UNFCCC Parties have had extensive discussions about the scope of REDD since 2005 at the Montreal Conference. Those discussions began with RED (i.e., limited to deforestation only) and expanded to REDD with consideration of forest degradation, then broadened to further consider forest conservation, sustainable forest management, and enhancement of forest carbon stocks.

Current convergence recognizes the need for a REDD mechanism to cover all forests and nothing but forests (Table 1.1), although a long-term vision for full accounting across the entire sector of agriculture, forest, and other land uses (AFOLU) remains viable. Divergence of opinion remains on whether there should be a primary set of measures against deforestation/degradation, and a secondary set for other forest-based mitigation options. A gap remains regarding the question of whether Parties intend “enhancement of forest carbon stocks” to include forest restoration only on lands already classified as forests, or also forestation of non-forest land. In the latter case, double counting with eligible clean development mechanism (CDM) afforestation/reforestation projects activities must be avoided.

Table 1.1 Mitigation activities potentially included under REDD

Changes in	Reduced negative change	Enhanced positive change
Forest area (hectare)	Reduced deforestation	Afforestation and reforestation
Carbon density (carbon per hectare)	Reduced degradation	Forest restoration, rehabilitation, and sustainable management of forests

Source: Adapted from Angelsen and Wertz-Kanounnikoff (2008).

There is widespread consensus that REDD must add to, rather than substitute for, deep emission reduction commitments from industrialized countries. The urgent need for emission reductions across mitigation sectors calls for the development of flexible, adaptive REDD financial instruments that put in place incentives to enable substantial reductions without further delay. At the

⁵ IPCC 2007.

⁶ UNFCCC Decision 1/CP.13.

⁷ UNFCCC Decisions 2-4/CP.13, Decision 2/CP.13 being dedicated to REDD.

same time, REDD countries should be supported to move toward larger-scale, more precise GHG-based approaches that compensate emission reductions and enhancements of removals and that are upwardly compatible with broader accounting of AFOLU.

Like other major mitigation options, realizing the potential of REDD to contribute to climate change mitigation will require the development and implementation of national development strategies to transform the relevant sectors, building on past experience. Such strategies need to be developed by and for each individual country, and will necessarily vary according to national circumstances.⁸ Considerable knowledge and flexibility will be required to enable effective implementation within complex national circumstances and to avoid creating perverse incentives that could either (i) promote increased emissions and/or decreased removals at national or subnational levels in the lead-up to implementation of policies intended to compensate emission reductions and/or removal enhancements, or (ii) accelerate displacement of deforestation and forest degradation activities from countries that are early entrants into a voluntary REDD mechanism to those that are not.

1.2 The Scope of this Report

This report describes a variety of design options for policy approaches. We use REDD in an inclusive manner and understand the associated concepts as follows:

- “REDD action” in the context of nationally appropriate mitigation refers to a wide range of sustainable development policies and measures to reduce emissions and/or enhance removals (see Table 1.1), knowing that these measures may well extend to the agriculture and bioenergy sectors in consideration of their impact on forests; and
- “REDD mechanism” refers to UNFCCC-agreed policy approaches and positive incentives to support REDD action.

The scope of the report is necessarily limited, and there has been no attempt at comprehensive review of every REDD issue, proposal, or option. Rather, the report focuses specifically on issues that have been identified as important considerations for adoption of a viable and effective REDD mechanism within the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the ad-hoc working

⁸ UNFCCC, Article 3, principle 4.

group on long-term cooperative action under the UNFCCC. The report is designed to clarify and inform some of the critical choices that will need to be made about including REDD in a Copenhagen agreement.

This admittedly limited scope means that a number of related and critical issues relevant to the implementation of REDD actions lie outside the domain of this report. These include, *inter alia*, country-specific approaches to readiness, nationally appropriate REDD strategies, and the promotion of sustainable consumption patterns in industrialized countries.

The lack of attention to those and other important issues in this report is in no way intended to deny or minimize their importance for the achievement of REDD outcomes. It does, however, highlight that, while the adoption of an effective REDD mechanism within a Copenhagen agreement is a major step toward realizing substantial mitigation potential that was excluded from the Kyoto Protocol, it is only a step. Subsequent steps, particularly those related to effective implementation, are at least equally challenging.

Akin to the larger climate change mitigation agenda in which it is embedded, REDD is a complex and dynamic challenge characterized by substantial uncertainties and risks. The Parties to the UNFCCC face the task of negotiating solutions that will have a substantial short-to-medium-term impact on reducing CO₂ emissions and that will allow for learning and improvement in the REDD mechanism and its implementation over time. This report considers options for such solutions in four contentious areas that are critical to a REDD agreement, namely:

- Finance (Chapter 2);
- Reference levels (Chapter 3);
- Monitoring, reporting, and verification (Chapter 4); and
- Promoting effective participation of indigenous peoples and local communities (Chapter 5).

The approaches taken in this report were vetted by consultation processes involving individuals from the key governments, indigenous peoples organizations, and NGOs involved in REDD negotiations. Consultations were conducted to solicit input, not to seek consensus. Hence, those consulted have in no way endorsed the contents of this report, for which the authors are solely responsible.

2. REDD Finance Options

REDD represents an opportunity for partnership between developing and industrialized countries for the benefit of the global climate system. Developing countries participate by undertaking REDD actions. Industrialized countries participate by sharing the costs associated with those actions.⁹ This chapter considers viable options for the conditions of that exchange in the context of a Copenhagen agreement under the UNFCCC.

REDD has been touted as a cost-efficient mitigation strategy with numerous analyses of REDD opportunity costs and the benefits and risks of linking REDD to international carbon markets. The current debate has, however, inadequately captured the following critical aspects:

- The opportunity costs of forest conservation, while an essential consideration for most individual landowners, are not precisely related to the actual financial and non-financial requirements to achieve forest-based emission reductions and/or removals. Actual costs can be realistically estimated only by careful, country-by-country analyses, and by taking a more holistic approach to the assessment of REDD costs and benefits.
- The prevailing market- vs. fund-based REDD debate perpetuates a false dichotomy that ignores the genuine necessity of (i) achieving substantial near-term emission reductions under conditions that, for the most part, are not amenable to compliance market entry; and (ii) providing long-term financial incentives to reduce emissions and enhance removals, including the option for developing countries to access compliance regimes.

⁹ Industrialized country efforts may also support REDD country efforts insofar as the industrialized countries, inter alia, (i) commit to their own deep emission reduction targets; (ii) reduce demand that drives deforestation and forest degradation (e.g., illegal timber); and (iii) provide as needed technical and/or administrative support bilaterally or through multilateral agencies.

2.1 A phased approach

REDD is a process that implies the design of low-carbon development strategies and the adoption of a new land-use paradigm. Before moving to full-scale implementation, countries need to go through a process of policy design, consultation, and consensus building, testing, and evaluation. Government ownership of the process and commitment from key actors in a country are essential prerequisites for successful REDD planning and implementation. Varied and flexible financial instruments that produce adequate, predictable, and sustainable resources are required to support such a process. Different financial instruments of the overall REDD mechanism may correspond to different phases of this process and include:

- 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.
- 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.
- PHASE 3: A GHG-based instrument that rewards performance on the basis of quantified forest emissions and removals against agreed reference levels.

Table 2.1 illustrates possible scopes and financial instruments applicable to the three phases. Sufficient flexibility to accommodate national circumstances should apply to the overall design and the transitions between the various phases. For example, countries could skip a particular phase, provided they meet the eligibility criteria for the next phase. Timing of transitions or graduations from one phase to the next will vary.

Table 2.1: Illustrative phasing options for REDD actions and corresponding financial instruments

Phase	Scope	International Financial Instrument
Phase 1	<p>National REDD strategy development, capacity building, institutional strengthening. Demonstration activities.</p> <p>Strategy development elements include, <i>inter alia</i>, reference level and monitoring, reporting, and verification (MRV) assessments and participation of indigenous peoples and local communities (see Chapters 3, 4, and 5, respectively).</p>	<p>Voluntary contributions.</p> <p>Eligibility: Demonstrated cross-sectoral commitment to REDD strategy development within the national government.</p> <p>Examples: Forest Carbon Partnership Facility of the World Bank (FCPF) and United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) “readiness” funding.</p>
Phase 2	<p>Implementation of National REDD Strategy PAMs.</p> <p>Strategy implementation elements include, <i>inter alia</i>, reference level setting, improvement of MRV, and participation of indigenous peoples and local communities.</p>	<p>Global facility (unitary fund, or clearinghouse that records eligible bilateral and multilateral contributions relative to binding commitments).</p> <p>Eligibility: Demonstrated cross-sectoral commitment to REDD strategy implementation within the national government. Continued access dependent upon performance, including proxy indicators of emission reductions and/or enhanced removals.</p> <p>Example: Brazil’s Amazon Fund.</p>
Phase 3	<p>Quantified changes in GHG emissions and/or removals.</p>	<p>Transition from global facility to integration with compliance markets.</p> <p>Eligibility: Compliance-grade MRV and emissions/removals accounting relative to agreed reference levels.</p>

Overlap between phases within countries may also be necessary and even desirable as the boundaries between the phases are porous. In general, two principles could be considered regarding the transition from Phase 2 to Phase 3:

- *No double counting* (i.e., no Phase 3 REDD units should be earned for emission reductions or enhanced removals achieved during Phase 2)
- *No incentive to delay action* (i.e., reference levels for Phase 3 should allow crediting for the results of the continuation of PAMs undertaken during Phase 2.

2.2 Mobilization of international finance

International REDD funding, including the proposed global facility under Phase 2, will have to be integrated into the overall financing provided under the UNFCCC as part of a Copenhagen agreement. 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.

Phase 1 finance is limited in scale but urgently needed. Therefore, it can be contributed on the basis of voluntary pledges from countries bilaterally or via multilateral organizations. As soon as the financial instrument for Phase 2 funding has been established, the international funding for capacity building could be converted into a window of the Phase 2 instrument. Capacity-building funds would remain separate as they cannot be tied to particular performance or results, but they could be administered jointly with other Phase 2 funds.¹⁰

Recent analyses of REDD funding needs provide a very wide range of estimates (see Annex 2.1 for a summary of finance needs and sources). Actual country needs will be better known after participant countries have conducted a REDD impact analysis and elaborated their REDD strategies. In the meantime, our review of available analyses indicate that USD 10 bn/yr could be usefully employed internationally to support REDD actions during Phase 2. To accommodate the twin circumstances of the global financial crisis and the need to enhance the effective absorptive capacity for this level of funding, a scaled approach may be appropriate, for example, USD 2 bn in 2010, increasing annually to USD 10 bn/yr by 2014. In accordance with national REDD implementation plans, these funds could usefully support, *inter alia*:

- Land tenure reforms;
- Forest management planning;
- Reduced impact logging;
- Expansion of forest reserves;
- Wildfire prevention;
- Forest law enforcement;
- Modernization of agriculture and the wood energy supply chain; and
- Payments for environmental services to indigenous peoples, local communities, farmers, and/or municipalities.

¹⁰ Demonstration activities and market trials (if desired) could be moved to GHG-based funding under Phase 3 as soon as the respective instrument has been established.

As described below, Phase 2 funding must be designed and perceived to be distinct from, and additional to, traditional Official Development Assistance (ODA), and maintain a strong “trade-not-aid” ethos and a culture of transparency. Previous global initiatives to reduce deforestation have had very mixed results, due in part to a decoupling of payment from performance as measured by tangible progress. In an “aid” paradigm, the USD 10 bn may exceed absorptive capacity, but smaller levels of industrialized country financial commitment may be identified as a piecemeal, incremental approach and not provide sufficient incentive for transformational change in REDD countries. As outlined in section 2.3.2, disbursement of funds would be on a contingent basis, which should help to avoid allocations that exceed national capacities to employ available funds. The adequate and predictable nature of proposed Phase 2 funding is intended to provide sufficient incentive to engender REDD country commitments and actions toward major changes in national development strategies consistent with a “trade” paradigm. Most critically, Phase 2 implementation would make substantial progress toward a 2020 goal of halving gross tropical deforestation.

In Phase 2, international commitments to finance REDD actions should be internationally binding and enforceable. Participation in international emission trading could be made contingent upon compliance with this funding commitment.

A robust harmonized fund-raising mechanism for Phase 2 funding would help to mobilize stable and predictable funding in the context of the Bali Action Plan. Such a single fund-raising mechanism could foresee the distribution of funds for various activities such as REDD, but also mitigation in other sectors, as well as adaptation. Alternatively, parties may decide to set up an international fund-raising mechanism specifically dedicated to REDD action. Either way, decisions related to international REDD funding would likely be made in conjunction with the negotiation of the overall financial architecture of a Copenhagen agreement.

International finance options for Phase 2 are summarized in Table 2.2.

Table 2.2: International finance options for Phase 2

Relevant international finance proposals	Description and amount
Voluntary contributions from government budgets	Official Development Assistance (ODA) type, no earmarked source of international funding.
	<p>Earmarked from the auctioning of domestic allowances</p> <ul style="list-style-type: none"> • U.S. auctioning of percentage of annual Assigned Amount Units (AAUs) (1 percent in 2012 to 7 percent in 2050), estimated USD 1–6 bn/yr (provision of Lieberman-Warner Climate Security Act debated and defeated in the U.S. Senate in 2008). • European Union Greenhouse Gas Emission Trading Scheme (EU ETS) revision proposal auctioning 20 percent of proceeds by 2020, estimated USD 10 bn/yr. <p>International funding still exposed to budgetary risks; mitigated by national laws earmarking international funding for REDD.</p>
Market-linked international levies, such as sale of AAUs	Estimated USD 15–25 bn/year (2 percent of AAU).
Transaction-linked international levies, such as levy on Clean Development Mechanism/Joint Implementation/AAU (CDM/JI/AAU) transactions	A 2 percent levy on share of proceeds from Joint Implementation and Emissions Trading, USD 0.03–2.25 bn/yr.
Mexican proposal	Contributions based on GDP, GHG, and population and possibly auctioning permits in developed countries, USD 10 bn/yr.
Swiss proposal	USD 2 per tCO ₂ -e with a basic tax exemption of 1.5 tCO ₂ -e per inhabitant, USD 18.4 bn/yr.
LDCs	Levy on bunker fuels or international aviation, USD 4–10bn/yr
Tuvaluan proposal	Auction of allowances for international aviation and marine emissions, USD 28 bn/yr.

Note: These proposals relate to adaptation and/or multisector mitigation finance and, although considered here to be applicable to REDD, were not made for that specific purpose.
Source: Adapted from UNFCCC 2008.

While voluntary contributions can be significant, in particular if internationally financed through the auctioning of domestic allowances, voluntary funding would be exposed to budgetary considerations and to changes in national policy priorities.¹¹ International REDD funding would have to compete not only with other international climate funding commitments but also with domestic priorities. Nonetheless, voluntary government contributions may be available in the near term to bridge the funding gap until more stable and robust financing options are in place.

¹¹ Although ODA has rarely been able to provide developing countries with predictable support, many investment finance instruments and insurance mechanisms allow for improvement (see *Lessons from ODA relevant to providing improved access to adequate, predictable and sustainable financial support* at www.REDD-OAR.org).

International levies, while less exposed to political interference, may be more difficult to negotiate and will have to deal with constraints imposed by international and national law. There is general opposition to international taxes from finance ministries, business, and policy makers. International levies such as those proposed above would, however, have the advantage that they would improve “access to adequate, predictable and sustainable financial resources” as per the Bali Action Plan (1e(i)).

Phase 3 could open the opportunity to access a larger scale of international finance, including private sources, via global compliance carbon markets and/or domestic emission-trading schemes. Accessing these market

options would not be compulsory. International funding could also be made available via the Phase 2 financial mechanism. In that case, funding would be assigned according to a GHG metric that translates tons in GHG reductions or removals into financing. Market connection is likely to increase access to substantial funds, especially if REDD carbon markets are open to private participants. Finance mobilized on compliance markets depends, however, on sufficient demand and favorable market conditions.

The ultimate volume of finance generated through tradable units for REDD remains a function of the depth of emission reduction commitments from industrialized countries, the fungibility of REDD units on the carbon markets, the details of the REDD rules and governance, the reference levels assigned and, of course, the success of REDD actions. Depending on the architecture of the eventual REDD mechanism, compliance-grade REDD

units could be acquired by countries or, if fungibility is guaranteed, by private entities for compliance with domestic emissions targets.

The creation of fungible carbon units would increase the liquidity of international carbon markets and reduce the overall costs of those entities covered by carbon market regulation. Nonetheless, there are legitimate concerns with respect to the predictability of the funding that can be accessed via markets. Perceived risks of wild swings in the price of REDD units would be prejudicial to the willingness to engage both potential buyers and sellers (see Annex 2.2 for the conditions that favor public and private engagement in REDD). A number of proposals try to address both the risks of market flooding and price volatility. These mechanisms, including the creation of non-fungible units, are discussed in Annex 2.3.

Preferable options for mobilization of international finance in Phases 1, 2, and 3 are described in Table 2.3.

Table 2.3: Preferable options for phased mobilization of international finance

	Critical feature(s) of international financial instrument	Most viable source(s) of international funding
Phase 1	Immediately available	Voluntary national commitments to multilateral or bilateral vehicles; eventual funding window of Phase 2 mechanism.
Phase 2	Predictable amounts over a defined period	Proceeds from levies on UNFCCC-controlled transactions; and/or enforceable pledges of government to transfer either agreed, absolute amounts or earmark proceeds from domestic levies, auctioning of allowances or other domestic fundraising mechanism.
Phase 3	Large-scale funding	Transition from Phase 2 to proceeds from sales of REDD units on compliance markets.

2.3 Delivery of international finance

2.3.1 Phase 1

Engaging in REDD requires a careful planning and preparation process, during which countries create the conditions for successful REDD actions. Financial and technical assistance may be needed to assess the impact of REDD on a country and to support training, data collection, strengthening of institutional capacities, and demonstration activities. Phase 1 would support a range of national and subnational REDD demonstration activities to test various REDD approaches designed to generate compliance-grade REDD units (see Annex 2.4 on subnational implementation of REDD).

2.3.2 Phase 2

Eligibility for participation in a Phase 2 financial instrument would follow demonstration of sufficient evidence presented to the global facility (see section 1.4.2), supporting:

- A critical review of past efforts to conserve and enhance national forest resources and a shared understanding of the current state of forests and causes of deforestation/degradation within and beyond the forest sector.
- A strong commitment to participate in REDD evidenced by a transparent participatory process including the highest levels of REDD country governments, allowing relevant ministries, national and local government agencies, and nongovernment stakeholders such as NGOs, indigenous peoples organizations, and private sector representatives to express their views, which ought to be taken into account.
- A nationally agreed REDD strategy to conserve and/or enhance forest carbon stocks. The template for country-driven REDD strategy documents should be elaborated by the governing body of the mechanism, based on principles agreed to by the Conference of the Parties (COP).
- An institutional framework in place to lead change, including the nomination of a REDD authority or function that serves as a REDD focal point for the participation in the Phase 2 financial instrument.

The allocation of the maximum international funding assigned to a country for Phase 2 finance would be best determined using a simple and unbiased criterion,

such as the national forest cover of participating countries, which would avoid creating perverse incentives and recognize past efforts.¹² Actual criteria for disbursement would be subject to negotiation. Delivery options should be flexible and appropriate to national circumstances. Two illustrative options for delivery are provided below.

Option 1: Disbursement according to approved national REDD budgets

Countries would translate their national REDD strategies into national REDD implementation plans that would serve as a request for international funding. National REDD implementation plans would cover a five-year period and contain the following elements:

- An identification of priority actions and associated funding needs;
- An implementation schedule for planned REDD activities;
- A budget and identification of expenditures eligible for international financing;
- Performance benchmarks related to administration, activities, and impacts. Such benchmarks would relate to criteria and indicators that would depend on the proposed activity (see Annex 2.5 for an example of possible performance criteria);
- A monitoring plan.

Cost-eligible expenditures for international funding would be limited to either (i) incremental costs,¹³ or (ii) a percentage of particular expenditures. The international approval of the national REDD budget and the annual performance evaluation would be undertaken by the global facility (see section 2.4.2). The facility could use third-party auditors to verify satisfactory compliance with identified performance benchmarks.

Option 2: Disbursement according to national REDD board decisions

¹² Additional criteria, such as historic deforestation rates and GDP per capita, could also be used.

¹³ Incremental costs are the difference between an environmentally friendly policy option and a less costly policy option; they are broadly interpreted as the costs of additional measures necessary to provide global environmental benefits. For example, the Global Environment Facility (GEF) only grants the incremental costs associated with transforming a project with national benefits into one with global environmental benefits.

Under this option, international funding would be disbursed to a nationally administered fund. There would be no need for ex-ante identification of spending decisions. REDD funding allocation would be decided on a regular basis by a national REDD board that would commit to transparency, effective stakeholder participation, and fiduciary responsibility.

The annual level of funding could be increased or decreased every year by decision of the global facility after consideration of a national REDD annual report. National caps could periodically be adjusted taking into account the following criteria:

- Performance (agreed criteria measuring policy effectiveness and/or proxies for increased GHG benefits);
- Accountability (transparency of decision making and accounting, fiduciary audit);
- Continuous improvement in the application of Intergovernmental Panel on Climate Change (IPCC) monitoring, reporting, and verification (MRV) methodologies;
- Domestic co-investment in accordance with common but differentiated responsibilities;
- Benefits for indigenous peoples and local communities;
- Ecological co-benefits.

Reporting for the purposes of the Phase 2 instrument would also require statements of expenditure and annual audits shortly after the end of each budget period.

Phase 2 would also include the establishment and maintenance of robust and transparent monitoring systems that can track changes in forest cover and associated emission factors based on IPCC methodologies (see Chapter 4). Once such systems are fully in place and capable of quantifying changes in GHG emissions and removals associated with the implementation of REDD strategies, a country can transition from Phase 2 to Phase 3.

2.3.3 Phase 3

Phase 3 describes a REDD financing instrument that would provide direct rewards for provision of climate benefits based on a GHG metric. A REDD mechanism could foresee the conversion of emissions

reductions or enhanced removals from REDD actions into REDD units that could then be sold to industries or governments for compliance with quantified emission reduction obligations.¹⁴ Alternatively, the compensation mechanism could rely on direct, non-market payments for emission reductions/removals.

A direct payment mechanism could rely on the institutional arrangements described for Phase 2. Ex-ante disbursement based on criteria, such as forest coverage or national REDD implementation plans, would be replaced by disbursement against emission reductions/enhanced removals.

Two carbon market design options are also possible within Phase 3: Emission reductions and enhancement of removals could be measured against an agreed reference level and REDD units could be issued ex-post after the environmental benefits have accrued and been measured and verified (*Option 1 – Sectoral Baseline and Credit*). Alternatively, REDD units could be issued ex ante based on an agreed reference level. A country could sell REDD units to raise funds or allocate units to subnational actors. At the end of the crediting period the country would be liable to match emissions from deforestation and forest degradation with REDD units (*Option 2 – Sectoral Cap and Trade*). Option 1 is easier to implement and does not require the maintenance of registries and the management of an allowance asset. It also limits a country's liabilities as there is no compliance requirement at the end of the commitment period. In turn, it does not give countries an asset and collateral against which they can raise finance. The ability to manage the asset comes with a liability to manage compliance.

Eligibility. Access to and participation in a GHG-based instrument would follow the fulfillment of a number of steps including:

- Phase 2 eligibility (section 1.2.2); and
- Methodological requirements:
 - An operational forest GHG inventory with track record of successfully reviewed inventory report(s) (i.e., implementation of MRV plan—see Chapter 4)
 - An agreed reference level endorsed by the UNFCCC of the Parties (see Chapter 3).

¹⁴ See Annex 2.2 for discussion of the conditions under which private entities participate in carbon markets.

2.4 Institutional arrangements

2.4.1 Institutional arrangements for Phase 1

Various prototype institutional arrangements are already in place to support REDD readiness (Forest Carbon Partnership Facility of the World Bank [FCPF], United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries [UN-REDD] and various bilateral initiatives) that complement activities implemented by developing countries with their own resources. In December 2008, the Subsidiary Body for Scientific and Technological Advice (SBSTA) recognized the importance of coordinating these arrangements and requested its Chair to explore ways of facilitating this coordination.¹⁵ While there is an immediate need for coordination, ongoing capacity-building support and institutional strengthening may become a window of the Phase 2 financial instrument. Countries would be eligible for a determined amount of funding enable swift eligibility to participate in Phase 2 and subsequently Phase 3 of the REDD financial mechanism.

2.4.2 Institutional arrangements for Phase 2

Institutional arrangements should enable the tracking of funding commitments and their impacts. Tracking can be achieved either by channelling all monies through one global account that collects and distributes resources (*Option 1* below), or by a clearinghouse that records and sorts bilateral and multilateral transactions (*Option 2* below).

Option 1: One global fund

The Phase 2 financial instrument could consist of one global fund linked to a robust international finance-raising mechanism for climate action.

This fund would be governed by a board including representation of REDD countries, countries that contribute to REDD financing, and representatives of civil society, such as indigenous peoples organizations and environmental NGOs. The Global Fund to Fight AIDS or the Forest Carbon Partnership Facility could serve as a model. (See Annex 2.6 for a comparison of various international funds.) The fund's board would hold the authority to upgrade and downgrade participants making them eligible for more or less

¹⁵ FCCC/SBSTA/2008/L.23, paragraphs 8 and 9.

relevant REDD funding. The board would require the assistance of a secretariat and the fund would also need a trustee to operate its transactions. This new vertical instrument under the authority of the UNFCCC COP could initially be composed of existing international REDD initiatives (e.g., the FCPF, UN-REDD, and various bilateral programs).

Option 2: A clearinghouse for decentralized REDD financing

The Phase 2 financing instrument could also rely on multiple funding channels including bilateral and multilateral. A REDD clearinghouse would be established under the authority of the UNFCCC COP for the purpose of: (i) coordinating REDD participating countries and the administrators of various international funding sources to ensure appropriate and equitable delivery of international support; (ii) reporting to the UNFCCC on the progress of REDD actions in participating countries; and (iii) reporting to the UNFCCC on support provided by industrialised countries to REDD action, whether through bilateral or multilateral channels. The advantage of such a decentralized mechanism is that it may harmonize better with existing systems and avoid perverse governance effects that have been associated with some vertical funds. A decentralized mechanism would, however, not be appropriate to administer a mechanism that relies on UNFCCC-controlled international fundraising mechanisms such as international levies and fees.

2.4.3 Institutional arrangements for Phase 3

The Phase 3 instrument will require a new and separate authority that certifies the environmental integrity of REDD units that are made available. This authority ought to be independent of national policies and international financing. This authority may be assigned to a dedicated committee under the Subsidiary Body for Implementation (SBI) or the Conference of the Parties (COP), assisted by the UNFCCC Secretariat. Chapter 3 and 4, respectively, discuss issues related to the process of establishing reference levels and verifying GHG inventories of the forest sector.

Because it is unlikely that most participant REDD countries will establish and maintain GHG registries in the short term, an international registry for the issuance of approved REDD units would also be required. This

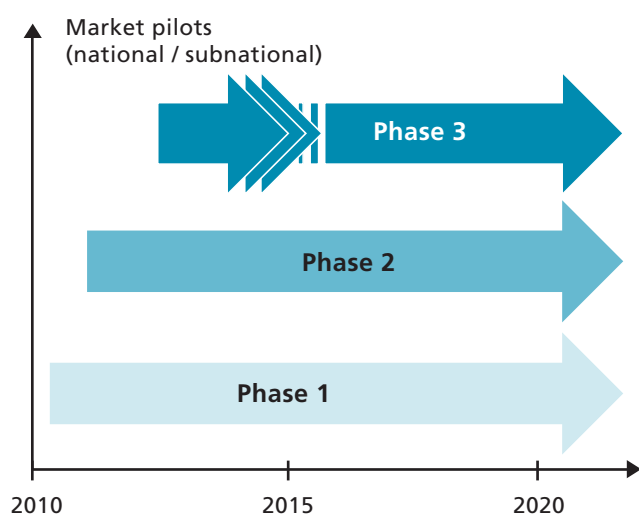
could be structured similar to the clean development mechanism (CDM) registry and managed by the UNFCCC secretariat. Participating REDD countries would open a national account in this registry and may decide to authorize nongovernment entities to hold subaccounts. The REDD registry would be linked to national registries via the international transaction log. An international mechanism could also approve and register authorized subnational activities (see Annex 2.4 for subnational implementation of REDD).¹⁶

A Phase 3 financial mechanism based on non-market compensation could rely on a separate window of Phase 2 institutional arrangements.

2.5 Timing options for Phases

Figure 2.1 presents the envisaged timing for the three proposed phases. Although participation in each instrument would be limited in time for most countries, the instruments would remain in effect beyond 2020 to support new participants and those that face outstanding barriers that prevent graduation to subsequent phases. Both options presume COP commitment to Phase 2 implementation in 2009 in Copenhagen.

Figure 2.1: Suggested timing for phasing in support mechanism for REDD action



¹⁶ These institutional arrangements for the Phase 3 REDD instrument are analogous to the treatment of the land use sector in countries with an emission reduction commitment under Kyoto Protocol Provisions for monitoring, reporting, verification, and accounting, established, respectively, in Articles 5, Article 7.1–3, Article 8, and Article 7.4 of Kyoto Protocol and corresponding decisions of the Marrakech Accords.

A Copenhagen agreement could select from a set of timeline options:

Option 1: Swift timeline for Phase 3 starting in 2013. Under this option a decision would be required in 2009 on an action plan for a decision on modalities, procedures, and reference levels of candidate REDD countries (through a REDD Reference Level committee under the UNFCCC), with proposed reference levels to be endorsed by COP decision by 2012.

Option 2: Cautious timeline for Phase 3 starting in 2018. Decision in 2009 on an action plan on modalities and procedures by 2011 and on the establishment of a REDD Reference Level committee under the UNFCCC, with proposed reference levels to be endorsed by COP decisions over 2012–2016 upon national submission and a positive recommendation from that committee.

The critical path for the first option is very tight because UNFCCC Parties need some indication of the amount of REDD offsets that could be credited before they commit to emission-reduction targets as part of a Copenhagen agreement. In addition, Parties may want to consider the agreed rules governing the treatment of land use, land-use change, and forestry in countries with an emission-reduction commitment beyond 2012 before they negotiate modalities and procedures for the accounting of REDD actions.

3. Options for Setting Reference Levels

Greenhouse gas (GHG)-based compensation of REDD requires an agreement on country-specific emission reference levels (RLs). RLs have profound implications for the climate effectiveness, cost efficiency, and distribution of REDD finance (funds) among countries, and involve tradeoffs between different interests and objectives.

Most proposals and analytical work on baselines concern deforestation, while degradation and removals (increases in forest carbon stocks) have received much less attention. Conceptually, most of the principles discussed in this section apply to forest carbon emissions and removals associated with changes in forest area and/or carbon density (see Table 1.1). Nonetheless, it is possible to work out separate RLs for each REDD activity type. For example, deforestation and forest degradation are driven by different processes: deforestation is primarily driven by the demand for land (mainly for agriculture), whereas degradation is driven by the demand for wood.¹⁷

This chapter deals mainly with deforestation, justified by its greater current and near-term impact on atmospheric CO₂ and the more advanced status of monitoring, reporting, and verification (MRV) methods for deforestation (see Chapter 4.) Within the context of the phased approach introduced in Chapter 2, RLs might be set based on area changes only for Phase 2 (potentially using default and fixed values for carbon densities or emission factors [Chapter 4]), whereas in Phase 3, RLs might differentiate between deforestation in forests with various carbon densities and also include estimates for density changes.

¹⁷ Although the principles are similar, there are also differences in the appropriate approaches for making deforestation and degradation baselines. Degradation can be predicted using an activity-based approach, that is, by trying to predict the level of the main activities, namely logging and collection of fuelwood (including charcoal). Combined with data for regrowth and other natural processes, BAU baselines for such activities can be used to set overall degradation baselines. Similarly, baselines for afforestation/ reforestation might be based on projections of the demand for different types of wood, e.g., as inputs in the pulp and paper industry.

3.1 BAU baselines, reference levels, and global additionality

The terms “baseline” and “reference line/level” can refer to different things. A critical conceptual distinction is between a business as usual (BAU) baseline and a crediting baseline.¹⁸ A BAU baseline is a technical prediction of what would happen without REDD and serves as a benchmark to measure the impact of REDD policies. A crediting baseline is the benchmark for rewarding the country if emissions are below that level (and not giving any reward or—depending on liability—invoking debits if emissions are higher). In this report we will use these terms and refer to the crediting baseline as the reference line/level (RL).¹⁹

The RLs can be seen as a modified BAU baseline, reflecting “common but differentiated responsibilities” to ensure global additionality and larger overall GHG emission reductions, in line with the UNFCCC objective of avoiding dangerous human interference with the global climate system.²⁰ This approach recognizes that REDD countries should share the costs of their own emission reductions/removals in a manner that is consistent with their respective capabilities and with the national benefits associated with those reductions/removals. It also recognizes that the RLs might change over time as REDD countries are able to bear greater responsibility for climate mitigation.

The additionality principle implies that incentives induce actions that would not have happened otherwise. This might be applied at a project, national, or global level. In the modeling analysis of this report we have applied this at the global level, but the principle might be implemented at lower scales.²¹ The global additionality criterion is implemented as a constraint in the model scenarios, wherein the global RL (sum of countries’ RL) cannot exceed the global BAU baseline (set as the global historical deforestation). The implications of setting the global RL *below* the global BAU are also explored.

¹⁸ See Angelsen 2008b for a further discussion.

¹⁹ The term “historical baseline” is also used, and can be seen as a way to predict future BAU deforestation and degradation.

²⁰ UNFCCC, Article 2.

²¹ This is indeed being done in, for example, CDM projects.

One assumption made in this report is that REDD countries will only participate to the extent that they have a net benefit (positive REDD rent²²). This principle is at times interpreted as setting national RLs equal to national BAU, but RLs can be below BAU and still be compatible with a “no-lose” principle. The reason is that the initial reductions are cheap, and the compensation received for the last reductions might cover the costs of the initial ones.²³

Setting RLs may influence climate effectiveness in at least two ways. For a given amount of REDD funding the reward per ton of carbon dioxide equivalent (tCO₂-e) of emissions reductions will be lower if the global RL is higher. High RLs therefore increase the risk of paying for non-additional “reductions.” As a result, incentives for further reductions by participating countries are smaller and the global reduction achieved is lower.²⁴ In contrast, low RLs may discourage country participation. If REDD countries have to undertake large emission reductions (compared to BAU) before being credited, then the overall costs may be higher than the REDD transfers. In short, the tradeoff is given by the equation:

$$\text{Total REDD finance} = \text{Net benefits to REDD countries (REDD rent)} + \text{real costs of REDD (opportunity + transaction costs)}.$$

Assuming there is a fixed amount of available funding for REDD, the maximum emissions reduction is achieved by setting RLs such that the REDD rent is minimized, and the REDD funds used to pay for the costs of emission reductions. This also indicates a tradeoff between the objectives of the international climate change agenda, which will seek to minimize REDD rent, and national sustainable development agendas, which would seek to maximize REDD rents

3.2 Procedures for reference levels

The determination of country-specific RLs should be based on best available information from sound science and on negotiations among the parties. The procedures for RL setting can vary along different dimensions: (i)

²² In economic terms, the *rent* is the difference between what a factor of production (capital, land, labor) is earning, and what it could earn in the next-best-paid employment (the opportunity cost). Used in this sense, the term is technical in nature and does not infer a value judgment regarding its amount and distribution.

²³ See an elaboration of this point in Box 1 in Angelsen 2008b.

²⁴ In a REDD market-based system the argument is similar: High emission reference levels will create a large supply of REDD credits in the market, lowering the carbon price.

Should RLs be established at the political level or at the technocratic level? (ii) Should RLs be agreed *en bloc*, or as countries get ready for REDD? (iii) Should the starting point be proposed RLs by the countries, or some agreed upon RL principles and formula? Responses to these questions must balance needs for country ownership, and global additionality vs. inflated RLs, expert input, and swift decision making.

The following procedural options may be considered for determination of RLs²⁵:

Option 1: At a future COP, political or government experts negotiate a table of country-specific RLs. The COP decision contains an overall global RL to ensure global additionality, and an annex with country-specific RLs.²⁶ The starting point for negotiations is a proposed set of RLs established following the application of a general formula reflecting broadly agreeable principles with country-specific data.

Option 2: As candidate Parties become ready to participate in a GHG-based REDD mechanism (see Chapter 2), future COP decisions over the years endorse RLs, based on proposed RLs by candidate participant Parties and after consideration and recommendation by the Subsidiary Body for Scientific and Technological Advice (SBSTA). Under this option, the SBSTA would periodically forward a list of national RL recommendations to COP for endorsement.

Option 3: As candidate Parties become ready to participate, future COP decisions over the years endorse RLs, based on proposed RLs by candidate participant Parties and recommended for endorsement by a formal committee established under UNFCCC. The Committee would be involved in exchanges with the focal point of each candidate Party and external expert assessments based on agreed-upon criteria for RL setting.

Option 4: As a combination of options 2 and 3, future

²⁵ These alternative processes are further described in Annex 3.4. Note that the same procedural issue holds for the establishment of reference levels for the land use, land-use change, and forestry (LULUCF) sector in countries that will take an emission-reduction commitment as part of the Copenhagen agreement. For LULUCF, under the net-net option, RLs would be set at the level of historic emissions/removals in an agreed base year or base period. Under the forward-looking baseline option, countries would forecast emissions/removals using models and information on the age class structure of their forests. The process of establishing and endorsing these estimates and the relationship with the negotiation of emission reduction commitments remains to be resolved within the ad-hoc working group on further commitments under the Kyoto Protocol.

²⁶ This approach follows the precedent of Article 3.1 and Annex B of the Kyoto Protocol.

COP decisions over the years endorse RLs, after consideration and recommendation by the SBSTA. The SBSTA will base its recommendations on the advice of a formal committee that it establishes. The committee would receive proposed RLs from Parties and consult with the relevant Party focal point and external experts prior to forwarding advice to the SBSTA based on agreed criteria for RL setting.

Countries are at very different stages in their readiness for REDD participation, making option 1 difficult to implement. The risk of inflated RLs calls for strong expert involvement, and options 3 and 4 might therefore best ensure that the overall aim of UNFCCC is met.

3.3 Criteria for setting reference levels

While RLs would be the outcome of negotiations among the parties, the starting point is likely to be specific calculations of countries' RLs based on certain criteria.²⁷ Most submissions by the Parties, as well as the Bali Action Plan, suggest that RLs should include historical national deforestation. The reference periods differ in the proposals. Some flexibility will be needed, for example, based on the availability of national-level data on forest carbon stocks and deforestation and degradation rates. The exact choice of historical reference period can have large impacts on the RLs and REDD benefits; thus some agreed-upon principles (e.g., last 10 years) are needed to avoid convenient choices of reference period. To avoid perverse incentives and reward early action, historical emissions up to 2005 could be used.

²⁷ There are a number of other proposals in the debate on how to set reference levels. These include using predictive modeling, although the distinction sometimes made between an historical and a modeling approach is an artificial one: historical rates are probably the best predictor in a model of future deforestation. This is further discussed in Annex 3.2. Another alternative, discussed in further detail in Annex 3.4, concerns the so-called stock-based approach. This can refer to different things: (i) stock-based *measurement* (to estimate changes in forest carbon stock [i.e., emissions/removals]), (ii) stock-based *payments* (incentives linked to *absolute level* of forest carbon stock, rather than *changes* in the stock), and (iii) stock-based *reference levels* (including forest carbon stock, or forest area as a proxy, as a variable in an emission RL formula). This report discusses favorably (i) and (iii), while it questions the overall effectiveness of stock-based payments. As a general principle, incentives should be linked to climate impact, namely anthropogenic reductions of emissions and/or enhancements of removals.

RLs need to be updated over time to reflect new and better information. Independent of performance, downward adjustments in RLs could be made to incentivize gradually deeper emission reductions with periodic review to take into account changes in national circumstances.

The forest area change may follow a pattern suggested by the forest transition (FT) theory, whereby at early stages in its development a country is characterized by high forest cover and low deforestation rates (HFLD countries).²⁸ Then deforestation rates accelerate (HFHD), and forest cover is reduced (LFHD), before the deforestation rate slows (LFLD), after which forest cover stabilizes and eventually starts recovering. FT is not a “law of nature,” and the pattern is influenced by national context (e.g., human population density, stage of development, structure of the economy), global economic forces, and government policies. A country may reach very low levels of forest cover before it stabilizes, or it might through good policies be able to “bridge” the forest transition—a central intent of REDD policy.

FT depicts a broad trend, and an extrapolation of historical rates therefore tends to *underestimate* future BAU deforestation for countries at the early stages in the transition (HFLD), while it tends to *overestimate* BAU deforestation for countries at the later stages (LFHD and LFLD).²⁹ This is illustrated in Figure 3.1.

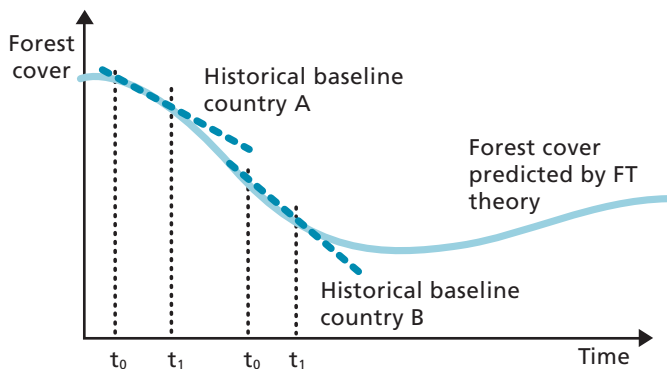
Forest cover and income (GDP) per capita are variables to consider in an RL formula to capture a country's stage in the FT. Countries with high forest cover can be expected to be at early stages of the FT. GDP per capita captures the stage in a country's economic development, which is linked to the pattern of natural resource use, including forests. The choice of forest cover and GDP per capita also fits well with the two key scenarios in the FT: (i) a *forest scarcity path*, where forest scarcity triggers forces (e.g., higher prices of forest products) that lead to forest cover stabilization; and (ii) an *economic development path*, where new and better off-farm employment opportunities associated with economic growth (= increasing GDP per capita) reduce profitability of frontier agriculture and slows deforestation.³⁰

²⁸ See Mather 1992; Rudel et al. 2005; Chomitz et al. 2006; and Angelsen 2007.

²⁹ Note that the forest transition describes changes in forest area rather than changes in forest carbon stocks.

³⁰ Rudel et al. 2005.

Figure 3.1: The forest transition and historical baselines



Source: Angelsen 2008.

When moving conceptually from the BAU baseline to the crediting baseline (RL), the simplest option is to set $RL = BAU$, which is sometimes the implicit assumption. This will ensure additionality at the national level, but there are reasons for making $RL < BAU$. The simple reduction below BAU is unlikely to represent the optimal contribution of REDD toward meeting the ultimate objective of the UNFCCC. Setting RLs below BAU may yield additional emissions reductions for any given amount of REDD funding (see Annex 3.5.2), and is consistent with the principle that REDD countries should undertake some uncompensated mitigation actions as a common but differentiated responsibility, with differentiation broadly linked to income level.

In a Phase 3 mechanism, there is a fear that including REDD credits in the compliance market will flood that market (i.e., lower the carbon price and crowd out other mitigation activities).³¹ Setting RL below BAU will reduce the number of credits brought to market. Similarly, in a fund-based system, high RLs will dilute the efforts and yield lower additionality.

The following variables are relevant to consider in an RL formula, and are used in the options assessed in section 3.5:

- **Historical national deforestation:** Past 10 years with some flexibility based on data availability, and updated every five years.
- **Forest cover:** Relatively higher RL given to countries with more than a given percent of the land area under forest cover (with some flexibility based on national circumstances).

³¹ See Chapter 2.

- **GDP per capita:** Relatively higher RL given to countries below a given GDP per capita.
- **Global additionality factor:** an adjustment to ensure global additionality, at the minimum, and possibly also deeper REDD cuts.

3.4 A simulation of the implications of different reference level options

“All models are wrong, but some are useful.”

—George Box

Various RL options were assessed using a simulation model (Open Source Impacts of REDD Incentives Spreadsheet, OSIRIS), designed to assess alternative REDD mechanisms. The model is further described in Annex 3.3.

As for all quantitative models, the results are sensitive to assumptions made, and the figures should be taken as rough estimates, more useful for relative comparisons of model output under different scenarios than for determining precise values.

The options are constructed by giving different weights to the four variables suggested in the previous section and the total amount of REDD funding.³² The analysis assesses four different options:

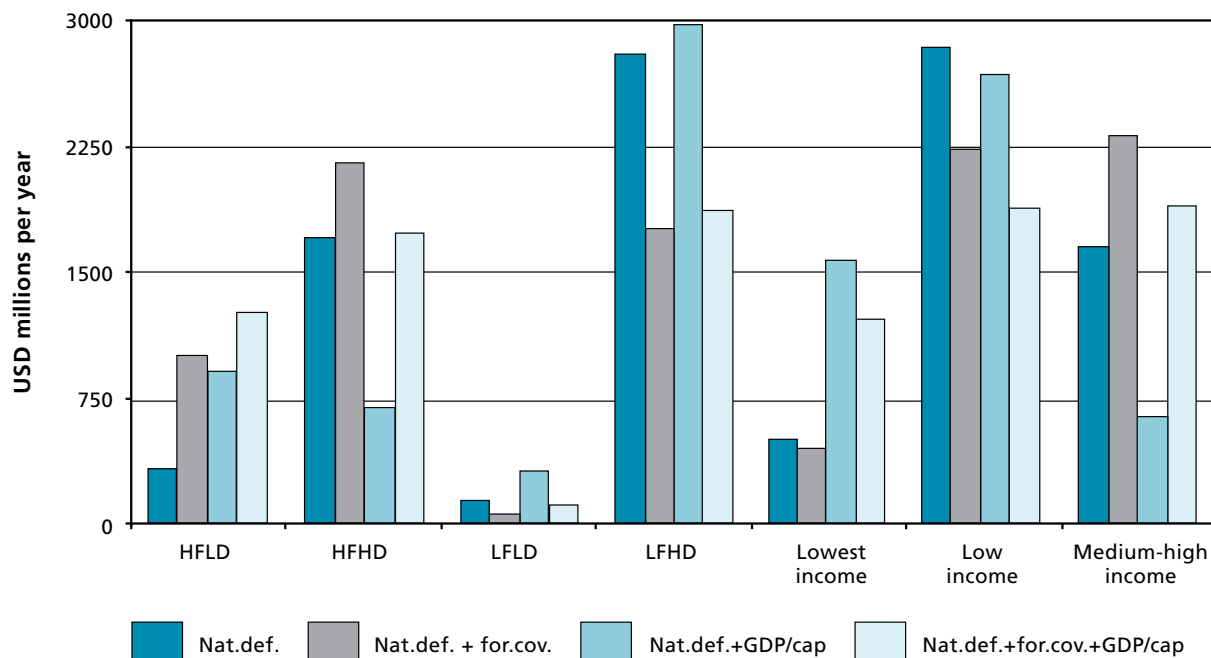
- RL = national historical deforestation (NHD) (100 percent weight)
- RL = NHD + forest cover (“quotas” equal to 20 percent of global historical deforestation allocated to countries with more than 50 percent forest cover)
- RL = NHD + GDP/capita (“quotas” equal to 10 percent of global historical deforestation allocated to countries with GDP/capita below USD 500)
- RL = NHD + forest cover + GDP/capita (“quotas” equal to 100 percent + 20 percent + 10 percent).

In each of the options the global scaling factor is used such that the global RL = the global historical emissions, i.e., the options show different ways of allocating a fixed global RL to countries.³³ The simulations assume a total REDD funding of USD 5 bn/year. The results are shown in Figure 3.2.

³² Assuming a fixed amount of funding does not indicate a preference for a fund approach, but should rather be seen as a pedagogical approach to explore the implications of different levels of funding, irrespective of the source of funding (see Chapter 2).

³³ The weight given to forest cover in option 2, for example, is therefore: $20 \times (100/120) = 16.7$ percent.

Figure 3.2 REDD transfers to groups of countries under different RL options



Note: The cutoff line between high/low forest cover is 50 percent, and for high/low deforestation 0.5 percent/yr (close to the average tropical deforestation rate, cf. FAO 2005). Lowest-income countries have GDP/capita below USD 500, low-income countries have GDP/capita between USD 500 and USD 2,000, while medium/high-income countries have GDP/capita above USD 2,000. The data table underlying this figure is found in Annex 3.5.

Option 1 allocates the largest financial transfers to high deforestation countries (HFHD, LFHD) because they have the highest emissions and therefore the highest potential for emission reductions. Introducing forest cover as a criterion (option 2) significantly increases the transfer to high-forest countries (HFHD, HFLD). In absolute terms, the increase is from USD 2.1 to USD 3.1 billion. In option 3, the poorest countries are given higher RLs, and this rather modest change dramatically increases their REDD transfers to the poorest countries from USD 0.4 to USD 1.7 bn/year. The HFLD group also has a substantial gain in this scenario (USD 0.3 to USD 1.0 billion). Option 4 includes both forest cover and GDP per capita as criteria. The outcomes lie between options 2 and 3, with both HFLD and poorest countries gaining.³⁴

³⁴These analyses assume that all countries are paid a uniform price per tCO₂-e emission reductions. Differentiated payment based on the real net costs of REDD (opportunity and other costs) is an alternative possibility (also referred to as “incremental payment”). In a typical scenario, approximately one-third of the transfer is to cover actual REDD costs, while two-thirds of the transfer is REDD rent. Thus, in theory, where USD 5 bn was used to cover *only* the costs of emissions reductions, the realized reductions in option 1 above would increase from 42 to 65 percent.

These simulations also assessed the implications on overall forest emission reductions (see Annex 3.5.1). Beyond national historical deforestation (NHD), RL criteria that are introduced for reasons other than to improve the BAU baseline tend to reduce effectiveness (e.g., from 42 percent emissions reductions in option 1 to 39 percent reductions in option 4).

The simulations illustrate a scenario where the global additionality factor is used such that the global RL = global BAU. Adding new criteria on top of NHD without any consideration to the global RL (not using the global additionality factor) reduces the overall emissions reductions significantly. In option 4, not using the global additionality factor (effectively setting global RL to 130 percent of global BAU) would reduce the emissions reductions achieved from 39 percent to 29 percent, underscoring the loss in overall reductions by handing out generous RLs.

Annex 3.5.2 assesses the implications of setting the global RL below the global BAU, i.e., setting the global additionality factor below 100 percent. Two conclusions emerge: (i) larger global emissions reductions might be

achieved with the use of a global additionality factor, although they are relatively modest; and (ii) the gain is higher when the overall amount of REDD funding is higher, because increased funding results in a higher REDD carbon price, making participation attractive—even with lower RLs.

Two more analyses are presented in Annexes 3.5.3 and 3.5.4. We assess the climate effectiveness implications of different levels of funding and assumptions of international leakage (deforestation activities moving from participating to nonparticipating countries, see also Annex 3.4). The leakage assumption has profound implications for the reductions achieved, causing the projected global reductions to vary between 29 and 47 percent in the USD 5 bn/year scenario. The analysis also illustrates the increasing costs of REDD: while the first USD 5 bn generate 42 percent reductions in the midrange leakage scenario, going from USD 15 to USD 20 bn generates only 6 percent additional reductions.

4. Options for Monitoring, Reporting, and Verification (MRV)

This chapter focuses on national-scale³⁵ MRV of REDD under a greenhouse gas- (GHG)-based mechanism (Phase 3), including:

- Definition of activities potentially eligible under REDD;
- Main aspects of monitoring carbon emissions and removals from REDD activities, with a focus on climate benefit versus cost;
- Needs associated with reporting emissions reductions and enhancements of carbon stocks given the UNFCCC general reporting principles and guidelines; and
- Verification that reporting on REDD activities meets the requirements outlined in the UNFCCC guidelines.

Implementing MRV will require increased capabilities in REDD countries, in most cases including technology transfer. In particular, there will be a need for enhanced capabilities in both current and evolving technologies in remote sensing to access and process the data for national needs, and in methods for measuring and estimating carbon stocks in key pools.

4.1 Options for defining eligible activities under REDD

This section presents options for defining eligible activities that are based on current modalities under the UNFCCC and its Kyoto Protocol. Under the UNFCCC, only generic definitions on land uses were agreed upon, but under the Marrakech Accords a more prescribed set of specific definitions for land use, land-use change, and forestry activities were agreed upon, although some flexibility was left to countries.

4.1.1 Defining forests and deforestation

Emission and removal estimates from REDD activities are affected by how forests and REDD activities are defined. Forest definitions are myriad; however, common to most definitions are threshold parameters including minimum area, minimum tree height, and

minimum level of crown cover. The two most commonly used definitions of forest are those used by the Food and Agriculture Organization of the United Nations (FAO)³⁶ and the Kyoto Protocol Marrakech Accords.³⁷

The Marrakech Accords' definition offers flexibility for countries that are designing a monitoring plan because the use of remote sensing data allows the application of different thresholds for minimum tree crown cover and area depending on national circumstances. This flexibility does not exist in the FAO definitions, although FAO definitions lie within the Marrakech Accords ranges, and therefore countries could maintain a single system for reporting, consistent with both the Marrakech Accords and FAO definitions (apart from trees in agricultural production systems).

The Marrakech Accords' definition allows for flexibility in defining which additional tree-covered areas to include or exclude under REDD. This is particularly important when considering the enhancement of carbon stocks as a REDD activity. For example, a country could decide to include agroforestry activities under REDD as long as the areas met the country's definition of forest. Many countries have already decided on their thresholds for definition of forest and have registered them with the UNFCCC. Using a definition for forests under the REDD mechanism that is different from that used under the clean development mechanism (CDM) would add complications to the monitoring system as the two forest types would need to be tracked separately. Moreover, it will be critical that there is within-country consistency in forest definitions for all REDD activities for integrating different types of data and information. The Marrakech Accords definition is quantifiable and, once established, monitoring gross deforestation is clearly

³⁶ Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. This includes plantations primarily used for fiber production or protective purposes; areas with bamboo and palms, provided that height and canopy cover criteria are met; forest roads, firebreaks, and other small open areas; windbreaks, shelterbelts, and corridors of trees with an area of more than 0.5 hectares and a width of more than 20 meters. Excludes tree stands in agricultural production systems, for example, in fruit plantations and agroforestry systems.

³⁷ UNFCCC (2001): COP-7: The Marrakech Accords. This includes: minimum forest area: 0.05 to 1 ha, potential to reach a minimum height at maturity *in situ* of 2 to 5 meters, minimum tree crown cover (or equivalent stocking level) of 10 to 30 percent. This definition does not exclude any particular woody land use as long as it meets the thresholds decided on by a country.

³⁵ Although the focus in this section is on national-scale MRV, the issues and options presented are also relevant to subnational implementation within a national accounting framework (Annex 2.4).

observable as the direct, human-induced conversion of forested land to non-forested land,³⁸ and is covered by the category of forestland converted to other lands in the Intergovernmental Panel on Climate Change (IPCC) 2003 Good Practice Guidance (GPG).

There is considerable concern that the forest definition should not include industrial plantations to prevent such forests from being eligible for carbon credits. This concern is misplaced if a well-designed monitoring system is in place for REDD (see Annex 4.1.1), but to allay such concerns, countries could exclude such industrial plantations in their definition of forest. However, for activities related to enhancement of carbon stocks, particularly conversion of “other lands to forests,” establishment of plantations is eligible under the CDM (afforestation/reforestation activity).

4.1.2 Defining degradation, forest conservation, sustainable forest management, and enhancement of carbon stocks

Two key options exist for defining these eligible activities under REDD: (i) attempting to define each individual activity based on a variety of unique criteria, taking into account national circumstances, or (ii) using the existing IPCC GPG framework.

Given the difficulties and lack of agreement among experts on defining forest “degradation,”³⁹ it seems it would be an enormous task to attempt to get agreement on definitions of all potential activities included under a REDD mechanism as described in the Bali Action Plan. Fortunately, the existing IPCC GPG framework provides approaches and methods for accounting for changes in carbon stocks from changes in the use and management of all forestlands, and this framework has already been accepted by all Parties. REDD activities other than deforestation that are mentioned in the Bali Action Plan are covered by the two categories in the IPCC GPG of (i) “forest remaining as forest” (degradation, forest conservation, sustainable forest management, and enhancement of carbon stocks [in existing degraded forests]), and (ii) “land converted to forest” (enhancement of carbon stocks through afforestation/reforestation of non-forest land).

³⁸ Decision UNFCCC 11/CP.7.

³⁹ IPCC 2003.

4.2 Options for monitoring

For the purposes of this report, monitoring refers to the collection of data and information at a national level, and performance of the necessary calculations for estimating emission reductions or enhancement of carbon stocks (and their associated uncertainties) against a reference level (i.e., the process of national monitoring of GHG-based performance of REDD interventions; see Chapters 2 and 3).

4.2.1 What should be monitored?

The IPCC GPG refers to two basic inputs with which to estimate GHG inventories: activity data and emissions factors.

Activity data in the REDD context refer to the areal extent of an emission/removal category; e.g., in the case of deforestation, it refers to the area of deforestation, presented in hectares over a known time period (see Annex 4.1.2 for further description). For REDD, Approach 3 in the GPG report is the only approach that explicitly tracks land-use conversions spatially, including gross deforestation.

To monitor REDD activities, an initial forest area map that represents the point from which each future change in forest area will be determined is needed. This initial forest area map (referred to here as a benchmark map) should be linked to a benchmark year against which all future REDD activities will be monitored.⁴⁰ A practical year to use for the benchmark map would need to be negotiated, but a reasonable year against which all future changes in forest cover could be monitored is either 2005, when the issue of deforestation was first raised at the Conference of the Parties, or 2007, the year of the Bali roadmap, which encouraged demonstration activities. The forest area benchmark map would show where forests exist and how they are stratified, for example, by threat for deforestation or degradation, carbon stocks, or for other national needs.⁴¹ The use of a benchmark map also makes monitoring a potentially more cost-effective task as the interpretation of remote sensing imagery needs only to identify the areas (or pixels) that changed compared to the benchmark map (although see Annex 4.3 and 4.4 for challenges in monitoring all REDD activities). The benchmark map would then be updated at the start of each new analysis interval.

⁴⁰ GOF-C-GOLD 2008.

⁴¹ Pearson et al. 2008 op. cit.

Emission factors refer to the emissions or removals of GHG per unit activity—e.g., tCO₂ emitted or sequestered per hectare. Emissions or removals resulting from land-use conversion are manifested in changes in ecosystem carbon stocks (in the five eligible pools; see Annex 4.1.2), and for consistency with the IPCC GPG, emission factors are expressed in units of metric tons of carbon per hectare. There are three tiers of data for emission factors in the IPCC GPG (see Annex 4.1.2 for more details) that are currently based on ground measurements.

Although moving from Tier 1 (default data in GPG; see Annex 4.2 for examples of Tier 1 data) to higher tiers improves the accuracy and reduces the uncertainty of the estimates, it also increases the complexity and costs of monitoring. However, if a country is committed to making real and transparent reductions in emissions from REDD, the Tier 1 level is inappropriate for key categories—collecting data for a Tier 2 level (even if a low level of Tier 2) demonstrates a minimal level of national commitment to REDD implementation. Monitoring deforestation at a Tier 2 level is achievable at a relatively low cost because the cost to obtain adequate field data on forest C stocks, particularly in areas under the highest threat for deforestation, is relatively low (no national inventory is needed). Tier 2 costs for other REDD activities are substantially higher.

Consistent with the phased approach described in Chapter 2, during Phase 1, Approach 2 for activity data and Tier 1 for emission factors should be used to identify key categories as described in the IPCC GPG. As countries progress to Phase 2 and 3, Approach 3, providing explicit gross rates of change in forest cover, and higher tier levels should be used in the monitoring system for the key categories. Internationally acceptable methods, guidance, and standards should be developed to build on the existing GPG framework to improve the quality of data on emission factors for Tier 2 and above. Higher-tier reporting should be possible if developing countries have access to the financial resources and technical capabilities needed to implement national monitoring systems (see Annex 4.5 for estimates of cost of monitoring).

While the capacity for monitoring gross changes in forest cover is improving rapidly with advances in remote sensing technology, in many developing countries reliable data on carbon stocks are scarce and allocating significant resources for monitoring may be difficult.

Reducing the cost and making funding available to developing countries for acquiring remote sensing data and monitoring as part of national monitoring systems would help to alleviate this problem.

There are two options for determining which pools to include in a monitoring system under REDD: (i) for global consistency, all countries could be required to include all five approved carbon pools in their emission factor—this would require high capabilities and be costly to implement; or (ii) allow countries to choose which pools to include and provide evidence of the conservativeness of their choice, consistent with the rules for afforestation and reforestation activities under the CDM and for national GHG inventories of the land use, land-use change, and forestry sector in countries with an emission-reduction commitment—a more cost-effective option.⁴² Regardless of which pools are included in the reference level and REDD interventions, there must be consistency within the country in their selection and subsequent monitoring through time.

4.2.2 Options for monitoring: Gross deforestation

There are two options for estimating emissions from gross deforestation: (i) gross emissions, which do not include replacement vegetation; or (ii) net emissions, which do include replacement vegetation. Net emissions consider both the C stock of the forest being cleared and the C stock of the replacement land use, while gross emissions consider only the C stock of the forest being cleared. Estimating *net* emissions from *gross* deforestation is consistent with the method for emissions from other REDD activities (see sections 4.2.3 and 4.2.4).

Estimates of gross emissions from gross deforestation will overestimate a REDD activity's impact on the atmosphere; that is, reference levels (baseline) will be higher than what the atmosphere sees because the replacement vegetation, which can sequester significant amounts of carbon, is not included. Because GHG-based emission reductions are derived from a comparison with a reference level (Chapter 3), gross emission reduction

⁴² For example, within a given country, the relative contribution of a given pool to the emission factor caused by, say, deforestation will vary—emissions from converting forests on highly organic soils to annual cropland could result in large carbon emission (thus, a country would likely include the soil carbon pool), but conversion of forests on mineral soils to pasture or other perennial crops will result in practically no emissions from soil (and thus a country would likely exclude the soil pool) (see Annex 4.1.3).

estimates from deforestation may also be larger than the actual impacts on the atmosphere. The magnitude of the impact will depend on the final land use of any converted forestland (woody or non-woody plants on lands) and how the converted land uses in the baseline case differ from the REDD intervention case. Monitoring replacement land use after deforestation also provides a system for collecting information for national policy development, especially in the agricultural sector.

4.2.3 Options for monitoring: Forests remaining as forests

Unlike deforestation, monitoring changes in carbon stocks of forest remaining as forests—including degradation, sustainable forest management, conservation, and enhancement of carbon stocks—can be more challenging, and for some activities the climate benefit is relatively small when compared to the technical challenges (see Annex 4.3 and 4.4). The framework for estimating emissions for the category “forests remaining as forests” is outlined in the IPCC GPG, and this framework estimates net emissions or removals as the product of the forest area affected and the net change in carbon density (either gain or loss).

Examples of the type of activities that lead to degradation or enhancement of C stocks, the likely magnitude of their climate benefit if the activity was changed, and the availability of methodologies and monitoring data are presented in Annex 4.3.1 and 4.3.2. Overall, emission factors for activities associated with reducing emissions from degradation generally have small climate benefits compared to reducing emissions from deforestation, areas are difficult to monitor in most cases (available data are limited, highly uncertain, and not readily detectable from the current suite of existing satellites), and require high levels of local capability. The application of new satellite techniques (e.g., high-resolution active radar and lidar), could help reduce these costs. Although the emission factors for degradation activities are generally small compared to emission factors for deforestation, the annual area of forests undergoing degradation may be larger than the area deforested, and thus total emissions from degradation can be significant.

Overall emission factors for activities associated with enhancing carbon stocks have small-to-medium climate benefits compared to reducing emissions from deforestation, and are difficult to monitor because available data are limited, highly uncertain, and not readily detectable from the suite of existing satellites.

Once a future REDD policy framework is agreed to, the IPCC GPG methodologies should be reviewed and assessed to determine if further elaboration is needed for REDD, specifically.⁴³ This could include, for example, further development of internationally acceptable methods, guidance, and standards, building on the existing GPG framework.

4.2.4 Options for monitoring: Other lands to forests

Internationally accepted methodologies and standards exist for monitoring this land conversion process because of the acceptance of afforestation and reforestation activities under the CDM. If warranted by inclusion in the future REDD policy framework, these methodologies should be reviewed to determine their acceptability for national REDD activities of enhancement of carbon stocks.

4.3 Options for reporting and crediting

Under the UNFCCC, there are five general principles that guide the reporting of emissions and removals of GHGs: transparency, consistency, comparability, completeness, and accuracy. The principles of completeness and accuracy will represent major challenges for many developing countries.⁴⁴ For key categories and significant pools, the principles imply the application of higher tiers and approaches, i.e., having country-specific data on all the significant pools stratified by climate, forest, soil, and conversion type at a fine-to-medium spatial scale and explicitly tracking land-cover conversions.

⁴³ For example, all aspects of losses and gains in C from timber or fuelwood extraction activities are not included, such as losses of C to logging roads, skid trails, and the like, nor the damage to residual trees; and additional guidance on stratifying forests with respect to risk for deforestation and degradation and estimates of C stocks (Pearson et al. 2008 op.cit.; Murdiyarto et al. 2008).

⁴⁴ Grassi et al. 2008.

There are two options for dealing with lack of completeness and high uncertainty in estimates from REDD activities: (i) use the principle of conservativeness and use discount factors as a pragmatic way to address the uncertainty of REDD estimates, or (ii) disallow the principle of conservativeness and follow the guidance in the IPCC GPG that promotes accuracy and requires a full uncertainty analysis. The pragmatic approach of conservativeness may simplify the requirements necessary for obtaining defensible estimates of reduced emissions or enhancements in C stocks from REDD activities. For reporting in the REDD context, conservativeness means that when completeness, accuracy, and precision cannot be achieved, the reported emissions reductions or enhancements in C stocks should be underestimated, or at least the risk of overestimation should be minimized, so as not to overestimate the true impact of REDD activities on the atmosphere.⁴⁵ Nonetheless, every effort should be made to help countries reduce the uncertainties around the data by using appropriate higher tiers and applying uncertainty analyses.

4.4 Options for verification

Reporting and crediting of GHG emission reductions and enhancement of carbon stocks under REDD relies on the robustness of the science underpinning the methodologies, the associated credibility of the resulting estimates, and on the way this information is compiled and presented.⁴⁶ The purpose of verification is to assess whether the information is well documented, based on IPCC methodologies, and transparent and consistent with the reporting requirements outlined in the UNFCCC guidelines. There are two options for verification: (i) assume the verification process used for reviewing annual GHG inventories of countries with an emission reduction commitment is adequate for verifying emissions reductions and/or carbon stock enhancements for REDD countries; or (ii) develop alternative verification processes for REDD mechanisms, particularly at Phase 3 (see Chapter 2).

The UNFCCC process for reviewing GHG inventories involves the intensive use of experts, and at present there are an insufficient number of experts on the UNFCCC roster. Using the UNFCCC to become the prime reviewer of REDD activities would clearly require more expert reviewers.

The verification process used for reviewing annual GHG inventories of countries with an emission reduction commitment should be adopted for verification of REDD emission reductions and/or carbon stock enhancements in Phases 1 and 2, and the UNFCCC Secretariat will require additional resources and a concerted effort to expand the roster of experts and approved verifiers for REDD activities. Lessons have been learned during the verification process for the CDM that can inform the development of standards for Phase 3.

⁴⁵ Grassi et al. 2008.

⁴⁶ GOF-C-GOLD 2008.

5. Options to Promote Effective Participation of Indigenous Peoples and Local Communities

The effective participation of indigenous peoples (IPs) and local communities (LCs) in a REDD mechanism and actions will have strong linkages to environmental effectiveness. The forest sector in many developing countries presents challenges for IP and LC participation due to the remote location of communities, illegal forest exploitation, weak governance, and lack of clarity regarding rights to land and natural resources.

Ensuring IP and LC participation through provisions adopted under the UNFCCC is challenging⁴⁷. Stringent international rules on participation of IPs and LCs in the international climate regime may infringe on national sovereignty, and there is an argument that issues of human rights are addressed through other international instruments, and therefore need not be dealt with under the UNFCCC.

This chapter presents options for promoting IPs and LCs participation in REDD, dividing them into three main categories:

1. Direct consideration under the UNFCCC

- Those that may be directly applied through the inclusion of relevant text in the Copenhagen agreement; and
- Those that may apply indirectly through inclusion of relevant processes in the design of an international REDD mechanism.

2. Other international instruments

- International-level options such as international human rights instruments, voluntary standards, civil society advisory boards, etc.⁴⁸

3. National-level implementation

- National-level options, such as rights and governance reform processes.

This chapter focuses mainly on the first category.

⁴⁷ The Annex to FCCC/SBSTA/2008/L.23 called for "Recognizing the need to promote the full and effective participation of indigenous people and local communities, taking into account national circumstances and noting relevant international agreements."

⁴⁸ Note that only other international legal instruments are reviewed in the main text of this chapter. Annex 5.3.3 discusses voluntary standards, civil society advisory boards, and a voluntary international fund for participation in REDD.

5.1 What constitutes effective participation of IPs and LCs?

The terms indigenous peoples and local communities are often highly generalized, but their interpretation could inhibit their participation in REDD. IPs and LCs are understood differently within differing legal and cultural contexts. In addition, while both IPs and LCs will be affected by REDD implementation, and the claims of both may be ignored or undervalued, IPs can refer to recognized international rights.⁴⁹ IP and LC participation can be promoted through procedural mechanisms, such as representation in decision-making processes, access to information, and appeals procedures. Participation can also be promoted more broadly through the creation of effective democratic processes, rights reform, and good governance.⁵⁰ Ensuring effective participation in REDD is likely to be context specific and in many cases may require governance reform well beyond the forest sector, significant political will, and time to build inclusive processes. Nevertheless, recognition of the following principles could promote participation:

- Definition of rights to lands, territories, and resources, including ecosystem services;
- Representation in REDD decision making, both internationally and nationally, including access to dispute resolution mechanisms; and
- Integration of REDD into long-term development processes.

5.2 Options for promoting participation within the UNFCCC process

5.2.1 Direct options through the legal text of a REDD agreement

IPs and LCs and other non-state actors have some existing procedural rights to participate in the Conference of the Parties (COP) and the Kyoto Protocol. The COP

⁴⁹ There is also significant heterogeneity within communities, and treating communities or peoples as homogenous units can reinforce existing power inequalities (e.g., Hoblely 2007).

⁵⁰ See: http://www.fao.org/participation/english_web_new/content_en/definition.html.

rules of procedure regulate the participation of NGOs as observers in the official proceedings and meetings of the Convention. These include rights to participate in the proceedings of any session and private meetings, under certain rules, to hold side events, and to make submissions to the Secretariat. They do not have rights to vote.⁵¹ To further strengthen the participation of IPs and LCs in REDD, the COP could adopt a number of principles and guidelines.

Guiding principles could be included in REDD legal text, such as rights to information and involvement in national decision-making processes. Such principles could help bring about changes at the national level and may act as a benchmark for assessing a Party's performance at the international level. In addition, procedural rights, such as consultation or access to information, can be included in an international REDD mechanism.

These principles would further enhance participation by inclusion of:

- Broad references to “rights” that include both procedural rights within REDD processes and rights to land and natural resources.
- Broad terminology to refer to “Indigenous Peoples and Local Communities,” encompassing a broad category of actors and recognizing collective rights (Annex 5.1).
- Cross-referencing to obligations in human rights instruments such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (Annex 5.3.1).⁵² This has the advantage of avoiding renegotiation but the disadvantage that some parties are not signatories of such agreements.

While it may be feasible for Parties to agree on general procedural principles, it may be difficult for them to come to agreement on more definitive references to rights.

Legal principles could be further strengthened by the development of specific guidelines for REDD.⁵³ Such guidelines have been developed in other international

instruments,⁵⁴ which generally cover procedural aspects of program implementation. For example:

- Establishing public consultation procedures at national/international levels;
- Strengthening local organizations and groups that represent the interests of IPs and LCs;
- Training staff in local regulatory and funding agencies; and
- Development of social impact assessments and involvement of IPs and LCs in assessment.

The impact of such guidelines in other international processes has been mixed.⁵⁵ Nonetheless, guidelines for IP and LC participation in REDD should be developed as soon as possible to help ensure participation from an early stage. Guidelines could be strengthened through provision of financial support for participation at the international level and/or by making delivery of REDD finance contingent on them being met. However, the latter option has perverse effects, such as reducing participation if countries/actors cannot meet the requirements and undermining local accountability structures.

The ability to access review systems is a crucial aspect of promoting effective participation. There are two main options for creating such systems within the UNFCCC process:

- An appeals system could be established that gives the opportunity for non-state actors to submit a complaint regarding a party that has failed to abide by the international standards agreed under a REDD agreement. Similar appeals systems exist in some other international environmental treaties.⁵⁶ Such a system would enhance effectiveness, but national sovereignty concerns may render it politically infeasible.

⁵¹ Under the Kyoto Protocol, the three main flexible mechanisms permit the participation of public and private entities, provided that the Party involved consents to such participation.

⁵² These are covered in more detail in Annex 5.3.3 along with other voluntary international initiatives such as voluntary standards, civil society advisory boards, and a voluntary international fund for participation.

⁵³ “Guidance” could also be developed, but this would likely be interpreted as voluntary and thus easier to negotiate, but less effective.

⁵⁴ For example, the detailed “program of work” adopted under the CBD to ensure full and effective participation of IPs “at all stages and levels” in the implementation of article 8(j). See Annex to the CBD COP 5 Decision V/16, available at: <http://www.cbd.int/decisions/?m=COP-05&id=7158&lg=0>.

⁵⁵ See, for example, CBD Ninth meeting, Bonn, 19–30 May 2008, Items 2.1 and 4.7 of the provisional agenda, report of the ad-hoc, open-ended working group on protected areas on the work of its second meeting.

⁵⁶ For example, the North American Agreement on Environmental Cooperation. Through articles 14 and 15, this agreement opens the opportunity for non-state actors to submit a claim to the secretariat that a state-party is failing to effectively enforce its environmental law. Upon receipt of the submission, the secretariat may decide to initiate a formal investigation that can lead to the elaboration of a “factual record” against the concerned state-party. The council may decide to adopt and make the factual record public by a two-thirds vote.

- Alternatively, non-state actors may be granted procedural rights that are protected directly at the international level in a REDD mechanism. The nature of complaints related to REDD initiatives that could be brought before the appeals body would be restricted to alleged violations of procedural rights of non-state actors as set out and protected under the REDD agreement⁵⁷ (see Annex 5.3).

The second option may be more politically feasible and particularly relevant to subnational implementation, but both options are limited in that they would only relate to noncompliance with procedures formulated at the international level. Review systems that relate to broader rights (e.g., to land) could form part of national REDD strategies and the governance of international REDD financing institutions.

5.2.2 Indirect options through the design of financial and MRV systems

The design of financial mechanisms and MRV systems is likely to affect the participation of IPs and LCs in REDD.⁵⁸ IPs and LCs could benefit from direct access to financial resources. Such direct access can either be achieved through markets or fund mechanisms. In both cases direct access would have to be authorized by the national government. Subnational market approaches may enable IPs and LCs to sell REDD units; participation would, however, depend on accessible procedures and manageable transaction costs.⁵⁹ Enabling participation would require additional support, for example, through provision of funding through local institutions, for civil society groups, for land reform processes, and for bundling projects together. Fund-based approaches, while probably generating lower levels of finance in the long run, may offer more flexibility in terms of design,

⁵⁷ The establishment of an appeals mechanism for the CDM has gained some support from Parties and observer organizations. If such an appeals mechanism were established, it could be designed broadly enough to allow not only appeals for violation of procedural rights formulated under the CDM, but to cover all mechanisms and all rights assigned to non-state actors under the UNFCCC.

⁵⁸ Note that other options in the design of REDD at the international level are also likely to have implications for participation in REDD. For example, the scope (breadth of emissions sources or sinks included) and the scale of mechanisms (whether they are national or subnational). The implications of these have been discussed in Peskett et al. 2008 and Brown et al. 2008.

⁵⁹ Note that there does not appear to be conclusive evidence that small-scale and simplified procedures under the existing CDM directly play a role in enhancing participation of IPs and LCs, although this would be expected.

and may be more easily targeted at IPs and LCs, but depend equally on the authorization of the national government.

Parties could also encourage the inclusion of IPs and LCs in ground-based measurement systems through REDD strategy design and technical assistance. There is evidence that such approaches can be cost-effective, improve decision making, and reinforce existing community-based resource management systems. IPs and LCs should also play a role in the mapping of lands and in enforcement of policies, especially in ground-based MRV systems that are likely to have implications for their livelihoods.

5.3 Other international instruments

There are a number of instruments outside the UNFCCC process that could indirectly facilitate participation of IPs and LCs in REDD action.⁶⁰ Several treaties granting rights establish enforcement mechanisms, including independent committees that monitor compliance and implementation. The International Labor Organization Constitution, for example, establishes a mechanism through which non-state actors can inform the ILO that a member state is not complying with an ILO convention. A committee will investigate the complaint and report its results to the Governing Body, which can require the state to take remedial action.⁶¹ In the context of indigenous peoples' lands, cases have been brought by organizations in Bolivia, Denmark, Ecuador, Mexico, and Peru (among others).⁶² Also, human rights treaties frequently require ratifying countries to enact domestic legislation to ensure that the rights granted are implemented and enforced at the domestic level.⁶³

International norms such as the principle of "Free Prior and Informed Consent" (FPIC) are also increasingly recognized by governments and industry as necessary procedures prior to external interventions.⁶⁴ These could

⁶⁰ These are covered in more detail in Annex 5.3, along with other voluntary international initiatives such as voluntary standards, civil society advisory boards, and a voluntary international fund for participation.

⁶¹ International Labor Organization Constitution, Article 24, available at: <http://www.ilo.org/ilolex/english/iloconst.htm>.

⁶² Orellana 2002.

⁶³ ILO Convention 169 in turn states that, "Governments shall have the responsibility for developing, with the participation of the peoples concerned, co-ordinated and systematic action to protect the rights of these peoples and to guarantee respect for their integrity." International Labor Organization Convention No. 169, Article 2, available at <http://www.ilo.org/ilolex/cgi-lex/convde.pl?C169>.

⁶⁴ Colchester and Ferrari 2007, cited in Angelsen 2008.

play a role in enhancing procedural rights. If not directly referenced in a REDD agreement, access to FPIC may be possible under other relevant instruments, where these are recognized.

Such instruments play a crucial role in protecting the rights of IPs and LCs, although their effectiveness is limited to the countries in which they are recognized. In some of the countries where such instruments have been ratified, effectiveness is also constrained by the inability of IPs and LCs to access legal systems and the common weaknesses of those systems.

5.4 National implementation of REDD

While the international architecture for REDD will set the framework for implementation, many of the social implications will relate to how governments choose to implement REDD at national and subnational levels. Key considerations for promoting IP and LC participation include:

- Strengthening rights and governance through implementation of forest tenure reforms, mapping of lands, and recognition of rights to ecosystem services;
- Prioritization of “pro-poor” policies and measures to achieve REDD;
- Alignment with national development processes, for example, by integrating REDD into inclusive and broad-based development strategies⁶⁵;
- Using REDD funding to support local government reform processes and social capital development, to help channel financial flows to IPs and LCs, and also to improve broader forest governance⁶⁶; and
- Development of stronger accountability⁶⁷ structures and institutions, for example, transparent information provision to IPs and LCs; inclusive multi-stakeholder processes; monitoring systems for the social impacts of REDD; and appeals systems.

Donors could provide voluntary support for IP and LC participation through supporting rights reform processes, provision of technical assistance (e.g., on developing impact evaluation processes), supporting civil society across multiple sectors, and provision of sources of up-front finance for IP and LC involvement in national and subnational REDD planning and implementation.

⁶⁵ Brown and Peskett 2008.

⁶⁶ Angelsen 2008. Ibid.

⁶⁷ Accountability can be defined as transparency, participation, evaluation, and complaints and response handling (Lloyd and Hammer 2008).

6. Conclusions

This report is intended to inform policy makers and negotiators about some of the critical choices they will need to make regarding the inclusion of REDD within a Copenhagen agreement. A good outcome for REDD in Copenhagen would create the enabling conditions for effective implementation in REDD countries, including financial incentives (Chapter 2); procedures for setting reference levels (Chapter 3); methodologies for monitoring, reporting, and verification (Chapter 4); and processes to promote the participation of indigenous peoples and local communities (Chapter 5). These are the enabling conditions at the international level, which constitutes the scope of this report. A sustainable outcome for REDD requires a global partnership with REDD country leadership needed for successful implementation, including participation of indigenous peoples and local communities, and industrialized country leadership provided through deep domestic emission reductions and support for REDD actions.

6.1 A flexible, phased approach

The national circumstances of REDD countries are extremely diverse. Flexible, phased implementation of REDD can help to accommodate their diverse capabilities. Table 6.1 illustrates the application of a phased approach consistent with the treatment of options described in this report.

6.2 Financial incentives

Chapter 2 of this report describes a progression in which REDD countries move from receiving financing for the development of national REDD strategies (Phase 1), to receiving support and incentives for the implementation of those strategies based on broadly defined performance (Phase 2), to payments based on quantified changes in GHG emissions/removals (Phase 3).

Table 6.1: A phased approach to REDD

REDD Phases	Phase 1	Phase 2	Phase 3
Activities	<ul style="list-style-type: none"> • Planning of policies and measures (PAMs) • Initial capacity building • Initial demonstration activities 	<ul style="list-style-type: none"> • PAM implementation • Scaled-up capacity building • Scaled-up demonstration activities 	Consolidation of PAM implementation
Performance indicators	<ul style="list-style-type: none"> • Assessment completed • Consultations conducted • Capacity enhanced • Demonstrations implemented 	<ul style="list-style-type: none"> • Policies enacted • Measures enforced • Proxies monitored for changes in emissions and/or removals (e.g., reduction in deforestation rate) 	Quantified emission reductions and/or stock enhancements (tCO ₂ -e)
MRV scope (tiers, activities, pools)	Increasing with phase graduation, upwardly compatible with the agriculture, forestry, and other land-uses (AFOLU) framework		
Liability	Increasing to national sectoral commitment		
Financing	Immediately available (e.g., voluntary contributions)	Predictable amounts over a defined period (e.g., AAU auction revenue)	Large-scale funding (e.g., compliance markets)

A central tenet of this progression is that the financial incentive should increase within and between phases commensurate with the participating REDD country's demonstration of commitment to achieving measurable and lasting net emission reductions.

Key suggestions for effective REDD finance include:

- Increased voluntary contributions to support Phase 1 activities, including those developed under the multilateral Forest Carbon Partnership Facility (FCPF) and UN REDD initiatives.
- Enforceable industrialized country commitment to Phase 2 REDD funding of a global facility to enable progress toward achieving a 50 percent reduction in global deforestation by 2020. We suggest a COP-level commitment to USD 2 bn/yr in 2010, increasing to USD 10 bn/yr in 2014. The global facility would finance REDD policies and measures (PAMs) with continued funding dependent upon performance.
 - The facility would preferably be a single fund, but could also be a clearinghouse that coordinates diverse support streams.
 - Disbursement could be based either on five-year national REDD implementation plans and annual performance indicators, or left to the responsibility of a national decision-making process.
- A relatively swift opportunity for transition from Phase 2 to a compliance instrument in Phase 3, which is based on quantified GHG emission reductions and enhancements of removals.
 - The transition opportunity should allow for flexible timing of REDD country entry, to accommodate the development of national-level compliance-grade MRV.
 - REDD units could be issued *ex post* after the environmental benefits have accrued, and been measured and verified (*sectoral baseline and credit*). Alternatively, REDD units could be issued *ex ante* based on an agreed reference level, wherein a country could sell REDD units to raise funds or allocate units to subnational actors. At the end of the crediting period the country would be liable to match emissions from the forest sector with REDD units (*sectoral cap and trade*).

6.3 Reference levels that encourage deep emission reductions

Chapter 3 of this report discusses challenges and tradeoffs associated with establishing reference levels for REDD. Reference levels should be set ambitiously to encourage deep emission reductions, but also need to encourage broad participation.

Key suggestions for effective reference levels include:

- Procedures for setting reference levels that are based on agreed criteria across countries to avoid opportunistic establishment of national REDD reference levels.
- Adherence to a principal of global additionality that strives to ensure that REDD is contributing to a reduction in overall forest-related emissions relative to business as usual across countries.
- Using historical deforestation rates as a point of departure for setting reference levels, with attentiveness to national circumstances including forest transition stage (forest cover) and income level (GDP per capita).
- Final determination of reference levels for REDD countries should be decided upon using a process compatible with that used for Agriculture, Forestry, and Other Land Uses (AFOLU) reference levels for industrialized countries.

6.4 Ensuring compliance-grade MRV

Chapter 4 of this report examines options for monitoring, reporting, and verification. As REDD emerges as a mainstream mitigation option, and particularly as both industrialized and REDD countries contribute financial resources toward achieving the mitigation potential of REDD, the MRV system must increasingly demonstrate itself to be compliance grade. The Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance (GPG) provides parameters that can ensure the reliability of MRV approaches. Adherence to and consistency with those methods will ensure MRV-compliant REDD.

Key suggestions relevant to MRV include:

- Employing the Kyoto Protocol (Marrakech Accord) definition of forest and the IPCC framework for GHG inventories and good practice guidance (GPG) for defining all eligible REDD activities included within the scope of the Bali Action Plan:
 - Requiring at least Tier 2-level monitoring to estimate net emissions from gross deforestation;
 - Promoting Tier 3 reporting consistent with increasing access to the necessary financial resources and technical capabilities needed for national monitoring systems;
- Flexibility and consistency with respect to the inclusion of diverse forest carbon pools in MRV⁶⁸;
- Future review of IPCC GPG methodologies to ensure applicability in response to the future REDD policy framework, including further development of internationally acceptable methods, guidance, and standards; and
- Adoption of the same verification process as used for reviewing annual GHG inventories of countries with an emission-reduction commitment.

6.5 Recognition of rights and roles of indigenous peoples and local communities

Chapter 5 of this report examines options to promote effective participation of indigenous peoples (IPs) and local communities (LCs) in a REDD mechanism.

Key suggestions include:

- Promotion of the participation of IPs and LCs in an international REDD mechanism, *inter alia*, via:
 - Broad and inclusive reference to IPs and LCs;

⁶⁸ Compatible with the approaches for determining inclusion or exclusion of approved carbon pools in emission factor calculations in the *land use, land-use change, and forestry* (LULUCF) sector for Annex 1 countries, and for afforestation/reforestation in the CDM.

- Establishment of rights to be consulted, heard, and informed for those affected by international and national REDD actions, including access to an international review system that gives non-state actors the opportunity of recourse to an appeals body;
- Provision of adequate resources to establish effective accountability systems and help overcome financial barriers to participation;
- Representation of IPs and LCs on the governing body of a global facility for REDD finance (Phase 2).
- Strengthening the national implementation of REDD, *inter alia*, via:
 - Formulation of guidelines to promote participation nationally; and
 - Support for key areas of national implementation, including land tenure reform, strengthening civil society organizations, involvement of local governments, and participation of IPs and LCs in MRV systems.

6.6 REDD within a Copenhagen agreement

The Bali Road Map should lead to a Copenhagen agreement at COP-15 that commits to climate stabilization at a maximum 2°C temperature increase, consistent with CO₂ concentrations below 450 ppm. Without REDD that climate stabilization goal will not be reached. The contents of this report represent a concerted effort to clarify issues and inform policy makers and negotiators about REDD as they strive to forge a Copenhagen agreement that will deliver effective, efficient, and equitable results. The opportunity is enormous and the challenge is daunting. The time for leadership is now.

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Annex 1: Glossary of Terms¹

Additionality

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

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 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, below-ground 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.

Carbon sequestration

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

Carbon stock

The mass of carbon contained in a carbon pool.

Certified Emission Reduction (CER)

A unit of GHG reductions issued under the clean development mechanism. One CER equals one metric ton of CO₂ 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 CO₂ equivalent).

¹ Some definitions taken from Angelsen 2008a.

Crediting baseline

As used in this report, a crediting baseline is the reference level against which climate benefits are measured and financial incentives rewarded.

Deforestation

As defined in the Marrakech Accords, the direct human-induced conversion of forested land to non-forested land.

Degradation

Changes within the forest that negatively affect the structure or function of the forest stand or site, and thereby lower the capacity of the forest to supply products and/or services. With respect to REDD, degradation refers specifically to a reduction in carbon density.

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.

Fungibility (of REDD units)

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.

Global additionality

For REDD, a constraint placed on reference level scenario modeling whereby the sum of REDD countries' reference levels cannot exceed the calculated global historical deforestation rate or a percentage thereof.

Global facility

As proposed in this report, a global instrument for the deployment of international finance to support the implementation of REDD strategies under the Phase 2 financial instrument. It can take the form of a single funding mechanism or a clearinghouse that coordinates different bilateral and multilateral support streams. The facility would finance policies and measures based on annual performance evaluations.

Gross deforestation

Area deforested in a particular period and zone, not taking into account the area afforested/reforested in the same period and zone.

Gross emissions

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

Indigenous peoples

There are no universally agreed international definitions of indigenous peoples, 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, Land-use 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 were not endorsed yet by the UNFCCC COP at the time of this report.

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 greenhouse-gas emissions by industrialized countries. The first commitment period of the Kyoto Protocol ends in 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.

Local communities

There is no universally agreed international definition of local communities, although the term has been defined in certain international legal instruments, and with respect to a particular activity commonly 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 or enhance the sinks of greenhouse gases.

Net 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.

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. In the context of the Phase 2 financial instrument, such metric can include indicators that refer to policy implementation or GHG proxies.

Phase 1 financial instrument

As part of the REDD mechanism proposed in this report, an initial support financial instrument that allows countries to access immediate international funding for national REDD strategy development, including national dialogue, capacity building and institutional strengthening, and demonstration activities.

Phase 2 financial instrument

As part of the REDD mechanism proposed in this report, a fund-based instrument that allows countries to access REDD finance based on 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 emission reductions and removals against reference levels.

Phase 3 financial instrument

As part of the REDD mechanism proposed in this report, a GHG-based instrument that rewards performance on the basis of quantified forest emissions and removals against agreed reference levels.

Phase 1 eligibility

Acceptance of a REDD participant country into the Phase 1 financial instrument based on the evaluation of REDD country action demonstrating cross-sectoral commitment to REDD strategy development within the national government.

Phase 2 eligibility

Acceptance of a REDD participant country into the Phase 2 financial instrument based on the evaluation of REDD country action demonstrating cross-sectoral commitment to REDD strategy implementation within the national government.

Phase 3 eligibility

Acceptance of a REDD participant country into the Phase 3 financial instrument based on the evaluation of REDD country action satisfying compliance-grade monitoring, reporting, and verification (MRV) and emissions/removals accounting requirements.

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 clearinghouse

Under the Phase 2 financial instrument, a proposed decentralized coordinating authority under UNFCCC that could oversee distribution of international funding sources among REDD participant countries, progress on REDD actions, and industrialized country support to REDD action.

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 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 in Phase 3 of REDD implementation.

Reference levels

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.

Reverse leakage (or positive leakage)

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

Sequestration

See carbon sequestration.

Sink (or carbon 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.

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.

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 Program 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 program.

Upwardly-compatible

For REDD, consistency of approaches with the opportunity for eventual integration with the agriculture, forestry, and other land uses framework (AFOLU) under the UNFCCC.

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 2: REDD Finance Options

2.1 Summary of REDD funding needs

Annex 2.1 provides multiple tables presenting estimates of costs for major REDD preparation and implementation actions, and current funding sources and the actions they target. Actual funding needs for REDD will be better known once participant countries have conducted a REDD impact analysis and elaborated their REDD strategies.

- To provide the context for the level of finance needed and amount of finance available, Table A2.1 summarizes the main REDD cost items and funding needs. Actions in early phases of REDD preparation and even implementation are expected to have a less direct effect on land-use emissions than policies and measures (PAMs) and payments for environmental services (PES) in latter phases of REDD. Funding for these actions will originate from either market or non-market sources. Early-phase REDD actions will require up-front finance, while in latter phases actions may also be rewarded via ex-post crediting.
- Tables A2.2, A2.3, and A2.4 present, respectively, the cost estimates of readiness activities, and the opportunity cost of deforestation and of REDD implementation. Multiple cost estimates exist for

each of the broad groupings of readiness actions listed according to purpose (strategy development, consultation, piloting, policy, and institutional reform, etc.). REDD funding needs analyses provide wide-ranging figures, as shown in these tables. The wide range of estimates and methods upon which they are based makes meaningful comparison difficult.

- Tables A2.5 and A2.6 list the amount of funding that has been made available to REDD readiness, implementation, and emission reduction purchase to date. Summary Table A2.5 shows at a glance, which funds from multilateral, bilateral, NGO, and private sector sources can be applied to these different purposes. Table A2.6 provides more detail on each of these sources, including the amount and primary purpose.

Faced with inconsistencies in the assumptions and methodologies through which the different estimates were derived, and some incomplete information in such a preliminary assessment, we can only estimate that REDD readiness and implementation costs for a 50 percent global reduction in forest emissions will range from USD 15 to USD 35 billion per year, while funds currently available are around USD 2 billion.

Table A2.1: Objectives, features, and funding needs for REDD preparation and implementation

	REDD preparation		REDD implementation	
	Readiness and up-front actions	Ongoing capacity-building and institutional strengthening costs	Policies and measures (PAMs)	Payments for environmental services, subsidies, direct REDD payments
Objectives	Enabling participation in REDD, appraising policy options, establishing strategy and consensus	Developing/Maintaining the ability to successfully implement REDD activities	Reduction of GHG emissions, improvement in forest governance and forest management	Compensation for the opportunity costs of REDD
Features	No or little direct effect on land-use emissions		Differentiated effects dependent upon PAMs employed--initial funding can have leveraging role	Performance-based payments, most likely voluntary, nationally or sub-nationally administered
Funding needs	Up-front funding Most likely non-market finance		Up-front funding potential mix of GHG-based crediting and other sources of funding	Suitable for performance-based financing

Table A2.2: Estimated costs for REDD readiness activities

Purpose	Hoare et al. 2008
Strategy development	\$200,000–\$1,000,000
Establishment of relevant infrastructure	\$700,000–\$1,500,000
Stakeholder consultations	\$150,000–\$2,000,000
Pilot testing	\$250,000–\$500,000
Establishment of baseline, monitoring system, and inventory	\$1,000,000–\$6,610,000
Land-tenure reform	\$4,000,000–\$20,000,000
Land-use planning and zoning	\$1,750,000–\$10,000,000
Development of capacity to provide support services for implementation activities, e.g., reduced impact logging, agricultural intensification	\$1,750,000–\$10,000,000
Forest policy and legislation reform	\$300,000–\$1,000,000
Tax reform (e.g., removal of subsidies/tax incentives)	\$300,000–\$1,000,000
Standards and guidelines	\$50,000–\$1,000,000
Enforcement of planning and environmental requirements	\$500,000–\$2,000,000
Independent monitoring	\$1,000,000–\$5,000,000
NGO capacity building	\$100,000–\$1,000,000
Effective judicial system	\$500,000–\$5,000,000
Institutional reform, clarification of roles and responsibilities	\$600,000–\$14,000,000
Treasury reform	\$500,000–\$5,000,000
Establishment of ability to process and manage payments to project beneficiaries	\$100,000–\$5,000,000

2.1.1 Estimated costs for REDD readiness activities

Table A2.2 presents a range of estimated costs for a single reference country to carry out the listed readiness actions over 5 years. Hoare et al. (2008:3) synthesize the estimates based on costs of such activities previously paid for by development aid, and some estimates made by countries themselves. The Eliasch review,² launched in late 2008, uses the upper limit of the costs of these major activities and concludes that USD 91 million is needed to carry out REDD readiness in a reference forest country.

² Eliasch 2008:218, Table 13.1.

A caveat in using these figures to estimate REDD readiness costs, as discussed in the Eliasch review, is that “costs of previous interventions do not necessarily reflect the actual amounts needed to achieve certain ends—funds spent are more often a reflection of the availability of funds and donor priorities rather than actual requirements.”³ And critically, “success in outcomes sought by this spending” is not a part of the estimate.⁴

³ Eliasch 2008:219.

⁴ Ibid.

2.1.2 REDD implementation costs: Opportunity costs and other implementation actions

Assessments of the opportunity cost that a country will face from not deforesting helps determine the positive REDD rent that can be expected at a given value of a carbon emission reduction unit. Nonetheless, the real net costs of REDD include the opportunity cost to be faced and REDD readiness actions (Table A2.2 above), and REDD implementation action costs (Table A2.4 below).

REDD is commonly presented as a cost-efficient mitigation strategy. Numerous analyses of REDD opportunity costs need to be supplemented by a close analysis of the specific additional actual costs of successfully implementing the activities, policies, and institutions that reduce emissions and/or enhance removal.

Table A2.3 looks at estimates of the opportunity costs of reducing deforestation that have been put forth by numerous studies over recent years. They differ in the percent of deforestation abatement they estimate, and whether they are estimating global opportunity costs, national-level costs, or specific groupings of particular countries. Some studies calculate the per ton of CO₂e cost. Different assumptions underlie the various estimates, including an ability to target payments and pay different rates according to individual opportunity costs, for example.

Table A2.4 also presents estimates of the costs of main elements of implementation of REDD. These include policies and measures for general REDD implementation, forest protection policies, measurement and monitoring activities, and administration and transaction costs.

Table A2.3: Opportunity cost estimates: Global, regional, national

	Scale				Source	Notes
	Global	Groupings	National	per tCO ₂ e		
Deforestation (10% abatement)	€0.3–€1.2 billion per year			€1.00–€2.00	Kindermann, et al. (2008)**	
Deforestation (8.4%–17.7% abatement; varies per region)				\$1.40	Sohngen and Beach (2006)***	
Deforestation (49% abatement)				\$1.60	Kindermann, Obersteiner et al. (2006)***	
Deforestation (50% abatement) by 2020	€15–€25 billion per year				European Commission (EC 2008)**	
Deforestation (50% abatement) by 2030	\$17–\$33 billion per year				Eliasch (2008)	Opportunity costs + rent: All credits sold at the price where supply and demand for credits are equalized despite the majority of credits being cheaper than this to supply. Rent constituted \$9 billion and \$18 billion, respectively, of the total amounts.

	Scale				Source	Notes
	Global	Groupings	National	per tCO ₂ e		
Deforestation (50% abatement)	€12–€20 billion per year			€7.00–€8.50	Kindermann et al. (2008)**	
Deforestation (50% abatement by 2025)	€0.06–€1.2 billion per year			€0.1–€2	Obersteiner et al. (2006)**	Balancing net present value of forest and non-forest land uses with a spatially explicit biophysical and socioeconomic land-use model. Supposing perfect information on deforestation pressures.
	€15 billion per year			€15	Obersteiner et al. (2006)**	Payments targeted to high-pressure zones.
	€85 billion per year			€85	Obersteiner et al. (2006)**	Without information or targeting (higher).
Deforestation (65% abatement)				\$2.80	Blaser and Robledo (2007)*	
Deforestation (65% abatement by 2030)	€7.4 billion per year			€2.00	Blaser and Robledo (2007)**	
Deforestation (69% abatement)				\$2.70	Kindermann, Obersteiner et al. (2006)***	
Deforestation (full halt by 2030)	\$12.2 billion per year				Blaser and Robledo (2007)*	No deforestation scenario; \$2.8/tCO ₂ (average carbon price) reduce forest emissions by 65%.
Deforestation (full halt by 2030)	€8.7 billion per year			€1.50	Blaser and Robledo (2007)**	
Deforestation (annihilation by 2030)	€30–€75 billion per year			Below €70	European Commission (EC 2008)**	
Deforestation (full halt)	€30, €113, €271 billion per year				IPCC WGIII AR4**	Global forest sector modeling.
Deforestation (94.7%–100% abatement; varies per region)				\$27.30	Sohngen and Beach (2006)***	

	Scale				Source	Notes
	Global	Groupings	National	per tCO ₂ e		
Deforestation (elimination)	€18–€130 billion per year			€8.00 to €55.00	Sathaye et al. (2007) as cited in UNFCCC	
African deforestation (50% abatement) Latin American deforestation (75% abatement)				\$50.00	McKinsey Report by Enkvist, Naucier et al. (2007)***	
Deforestation (50% abatement, 8 countries, over 30 years)		\$7 billion per year (2008)			Grieg-Gran, M (2008)	46% global deforestation considering legal, practical, market constraints on logging.
Deforestation (70% abatement) in 8 countries		\$5 billion to \$10 billion per year		\$1–\$2/tCO ₂ on average	Stern, N. 2007	Over time, marginal costs would rise.
Deforestation (elimination in 8 selected countries)		\$2.6 billion to \$11 billion per year		€1.40	Grieg-Gran, IIED, (2006; 2006b)**	Opportunity cost of foregone land uses. Selective logging not foregone. Assumes perfect information on pressures. Administrative costs involve an extra €3–10/ha/yr, i.e., €0.2–0.7 billion after 10 years.
		€3.5 billion per year		€2.40		Same as above, revenue from forest products also foregone.
		€8–€11 billion per year		€5.50–€7.50		Same, supposing higher agriculture returns.
Deforestation (95% abatement in top 20 forested developed countries)		€21 billion		€4.00	Strassburg et al. (2008)**	
Avoided degradation/SFM	€5.7 billion per year			€0.85	Blaser and Robledo (2007)**	

* Via Eliasch 2008.

** Via Grondard, Martinet, and Routier 2008. Currency conversions from UK pounds to U.S. dollars 2.5.09, 1 euro = 1.28 dollars.

*** Via Myers 2007.

Table A2.4: Cost estimates of Implementing REDD

	Action	Scale			Source
		Global	Groupings	National	
Policy and measures (general)	Necessary reforms and capacity building in 40 forest nations including the cost of building measuring and monitoring capacity, governance capacity to implement effective policies.		\$4 billion over five years (40 nations)		Eliasch (2008)
	National-baseline approach to REDD the potential costs for policy and measures country/ globally over 5 years.		\$340 million–\$2.3 billion over 5 years (25 nations)	\$14 million to \$92 million over 5 years	Hoare et al. (2008)
Forest protection policies	Adopting and implementing forest emissions reduction policies, ongoing monitoring costs, global administration (transaction costs) involved in halving deforestation through the use of payments to forest landholders.	\$233–\$500 million per year			Grieg-Gran, M (2008)
Measurement and monitoring	National forest inventories.		\$50 million (25 nations)		Eliasch (2008)
	Annual running costs national forest inventories.		\$7–\$17 million per year (25 countries)		
Administration and transaction costs	Mean transaction cost for producing the voluntary carbon credits in existing study of 11 moderately large forest carbon projects.			\$0.38/tCO ₂	Antinori, C and Sathaye, J (2007)
	Costs for REDD pilot projects.			\$0.03–\$4.01 per ton carbon (global) \$0.27–\$1.64 (LtAm)	Osborne and Kiker (2005) ***
	Set transaction costs globally at one-third of the opportunity cost over the second commitment period.	€10 billion per year			Grondard et al. (2008)

2.1.3 Available REDD funding sources and purpose

Tables A2.5 and A2.6 present a preliminary analysis of the contributions planned by multilateral, bilateral, and private sector or NGO stakeholders to REDD readiness, project implementation, and carbon credit purchase. Various caveats must be included with this data, particularly the incomplete public access to magnitudes of the funds, and the unresolved double counting between bilateral funding available and their inclusion also in the multilateral funds. The tables do not pretend to reflect all sources of funding; more REDD funds are made available by NGOs and bilateral and multilateral agencies.

Thus, roughly USD 400 million of multilateral contributions exist per year (excluding the Adaptation Fund), including an estimate that the World Bank's Forest Investment Program (FIP) and Congo sources are to be distributed over 10 years, and based on unknown final magnitudes of the FIP and the Forest Carbon Partnership Facility of the World Bank. Five of the 12 multilateral sources fund both readiness and project implementation, while 11 intend to fund REDD readiness activities. Bilateral donors equally fund readiness and project implementation, and these data currently estimate a contribution of over USD1 billion/year. Nongovernment actors are expected to fund about USD 200 million, focusing primarily on project implementation and credit purchase. Table A2.6 provides further detail about the specific purposes toward which the funding is directed.

Table A2.5: Summary of funding sources, amounts, and purposes

Source	Amount (millions)	Purpose		
		Readiness*	Project implementation	Carbon credit purchase
<i>Multilateral</i>				
World Bank BioCarbon Fund	\$91.9/~4 years		X	X
Forest Carbon Partnership Facility	[\$300] **/5–10 years	X		X
Congo Basin Forest Partnership	\$230/undefined	X		
Congo Basin Forest Fund	£100/undefined	X	X	
The Forest Investment Program	[\$100]/undefined	X		
FAO National Forest Programme Facility	\$48/year	X		
FAO National Forest Monitoring and Assessment Programme	Support per country	X		
International Tropical Timber Organization (ITTO)	\$16/year	X		
MIA Project	€0.040/project	X	X	
Regional development banks	\$94/year	X	X	
GEF	[\$109]	X	X	
Adaptation Fund	Several hundred \$ per year	X	X	
UN REDD Program	\$35	X		

Source	Amount (millions)	Purpose		
		Readiness*	Project implementation	Carbon credit purchase
<i>Bilateral</i>				
Norwegian Climate and Forest Initiative	Up to \$600/year (total \$2,500)	X	X	
Australia's International Forest Carbon Initiative	AU\$200	X	X	Unclear
Germany	Pledged €500 million 2009–2012 and an additional €500 million every year after that. EUA auctioning proceeds	X	X	
<i>NGO and Private Sector</i>				
Voluntary Carbon Market	Approx \$38.8 (2007)			X
World Wildlife Fund (nonprofit)	uncertain	X		
The Nature Conservancy (nonprofit)	\$5 million to FCPF \$38	X	X	
Katoomba Ecosystem Service Incubator	\$0.001–\$0.005 /project		X	
Climate Change Capital (private investment bank)	Uncertain		X	X
Macquarie Group Limited (investment banking and financial services)	Uncertain		X	X
Equator Environmental LLC	\$100		X	X
New Forests, Pty Ltd.	\$50		X	X
Terra Global Capital LLC	Trying to raise \$150–\$250		X	X
Sustainable Forest Management	Uncertain		X	X

*Capacity building, monitoring, and/or governance reform.

** Brackets indicate uncertain number.

Table A2.6: Detail of Funding Sources, Amounts, and Purpose

Source	Amount	Purpose
<i>Multilateral</i>		
World Bank BioCarbon Fund	\$53.8 million tranche 1 \$38.1 million tranche 2 Funds will be disbursed over the life of the fund (may be up to 2022)	Focus on A/R with some pilot REDD projects. Managed by World Bank.
Forest Carbon Partnership Facility (FCPF)	[\$300 million] over the life of the fund.	\$100m Readiness Fund to support readiness in 20 countries. \$200m Carbon Fund to buy REDD carbon credits. Managed by World Bank.
Congo Basin Forest Partnership	\$230 million over several years	Sustainable management of the Congo Basins' forests and wildlife. Partnership started September 2002 and is open ended.
Congo Basin Forest Fund	£100 million	REDD capacity building. Managed by Congo Basin Forest Fund Secretariat.
The Forest Investment Program (part of the Strategic Climate Fund)	[\$1 billion]	Focus on forest conservation and sustainable forest management. Details under discussion and may include REDD, AR, SFM, agriculture, governance. The Strategic Climate Fund is one of two funds established under G-8 Climate Investment Funds with USD 6.1 billion in pledged funding.
FAO National Forest Programme Facility	\$48 million per year	Support country's national forest program process. Focus on capacity building and information sharing. In operation since 2002.
FAO National Forest Monitoring and Assessment Programme	Support per country	National forest and land-use monitoring, assessment, and reporting. Reports completed in 15 countries with 20 additional expected.
International Tropical Timber Organization (ITTO)	\$16 million per year	Capacity building for SFM from sustainably managed forests.
MIA Project (Cooperative project on mitigation of and adaptation to climate change in sustainable forest management in Ibero America)	Up to €40,000 per project. Project proponents or their partners must pay 40% of the cost of the project	Mitigation and adaptation. Project proposals located in the Ibero-American region: Central America, Amazon, Andes, and the Southern Cone. CIFOR administers the fund to support eligible projects. INIA and CIFOR jointly coordinate MIA projects. CATIE oversees technical implementation of MIA projects in the Iberian-American region.
Regional development banks	\$94 million per year	Forestry for sustainable economic development, environmental conservation.
GEF	\$109 million	Agreed incremental global benefits from biodiversity, land degradation, and climate change.

Source	Amount	Purpose
Adaptation Fund	Several hundreds of millions \$ per year	Adaptation measures in countries that are particularly vulnerable to the adverse effects of climate. May include some forest-related adaptation. Managed by the GEF and World Bank.
UN REDD Program	\$35 million	REDD readiness. Collaboration between FAO, UNDP, and UNEP.
<i>Bilateral</i>		
Norwegian Climate and Forest Initiative	Up to \$600 million per year (total \$2.5 billion)	REDD readiness, research, and government programs. Includes funding to FCPF, Congo Basin Forest Fund, UN-REDD, and other initiatives.
Australia's International Forest Carbon Initiative	AU\$200 million committed	Focus on monitoring and accounting, supporting demonstration activities and market-based mechanisms. Funds distributed to multiple sources including the governments of Indonesia and PNG, the FCPF, and the Asia Pacific Forestry Skills and Capacity Building Program. Managed by Department of Climate Change, Government of Australia.
Germany	Pledged €500 million (\$788 million) for the 2009–2012 period and an additional €500 million every year after that. (2008)	Global forest protection. Funding managed by German aid and other agencies.
<i>NGO and Private Sector</i>		
Voluntary Carbon Market	Approx. \$38.8 million in 2007	In 2007, REDD made up 5% and AR 10% of the total OTC voluntary carbon market, which was valued at \$258.4 million.
World Wildlife Fund (nonprofit)	Uncertain	Capacity building, project design, standard development, initiating agriculture and sustainable land management project development fund.
The Nature Conservancy (nonprofit)	\$5 million to FCPF \$38 million in project finance (total) \$400,000–\$10.8 million/project	Capacity building, REDD project development.
Katoomba Ecosystem Service Incubator (Forest Trends – nonprofit)	Currently \$10,000–\$50,000/project Planning \$75,000–\$150,000/project	Technical, financial, and methodological support to payment for ecosystem services projects (including some REDD). 4 projects funded to date with plans to expand.
Climate Change Capital (private investment bank)	Uncertain	Investments in the emissions trading market. Planning a “Land Fund” to invest in agriculture land and forestry worldwide. No dedicated REDD investments.

Source	Amount	Purpose
Macquarie Group Limited (investment banking and financial services)	Plan to invest in six REDD demonstration activities over the next three years	Invests in the emissions trading market. Recently partnered with Flora and Fauna International to develop REDD projects. Macquarie is an investment banking and financial services group.
Equator Environmental LLC	\$100 million Eco-Products Fund – private equity fund	Invests in projects for generation and management of forest-based carbon credits and timber assets.
New Forests, Pty Ltd.	\$50 million in assets	Invests in carbon credit and other environmental services projects including timber. REDD investments possible.
Terra Global Capital LLC	Trying to raise \$150–\$250 million for a fund	Consulting and planning on raising a private equity fund to invest into AFOLU
Sustainable Forest Management (private capital)	REDD project in Peru under development, possibly other projects in identification stage.	Invests in forest carbon projects.

Sources for Tables A2.1 and A2.2: Antinori and Sathaye 2007; Eliasch 2008; Grieg-Gran 2008; Hoare et al. 2008.

Sources for Tables A2.3 and A2.4: Blaser and Robledo 2007; Grondard, Loisel, Martinet, and Routier 2008; Grieg-Gran 2008; “Review of the Economics of Climate Change, International Institute for Environment and Development; Stern 2007.

Sources for Table A2.5 and A2.6: Independent research (Internet, phone interviews); CIF/FDM.1/3 Forest Investment Program of the Strategic Climate Fund, Issues Note; Hamilton et al. 2008.

2.2 Conditions for public and private sector engagement in REDD

Multiple factors play an important role in encouraging or discouraging participation of different actors in REDD. Table A2.7 provides the detail behind what may motivate government and private actors to participate in REDD, while Table A2.8 provides a summary of the conditions that are most important to the principal actors. The key actors include:

Government:

- Central: National or federal government that represents the sovereign nation
- Local/Regional: State, provincial, or other local or regional government agency.

Private:

- Trader: A buyer and seller of REDD units after the units have been issued.
- Investor: Takes risk by (i) investing in a REDD project activity; (ii) providing financial and/or technical project development support; or (iii) someone who advances payment for REDD units.
- Seller/Community: A local project developer that may include a local entrepreneur, NGO, and/or a local community.

Although there may be particular aspects of more or less interest to a particular actor, there are four conditions that all the key actors require: clear, long-term demand; REDD unit fungibility; internationally accepted methodologies for quantification; and monitoring. Clear legal title to units is a condition for all that requires central government action.

Table A2.7: Summary of conditions for government and private engagement in REDD

Conditions	Government		Private		
	Central	Local/ Regional	Trader	Investor	Seller/ Community
Stable and certain up-front funding	X	X			X
Clear, long-term demand	X	X	X	X	X
REDD unit fungibility	X	X	X	X	X
Use of internationally accepted methodologies	X	X	X	X	X
Sufficient monitoring capacity	X	X		X	X
Political acceptability	X	X			
Clear legal title to units		X	X	X	X
Direct crediting				X	X
Enforceable sale and purchase contracts			X	X	X
Independent verification			X	X	X
Stakeholder consultation and engagement		X		X	X
Low host country risk				X	X
Ability to control risk				X	X
Clear legal title to land, forest, and units				X	X

Table A2.8: Conditions for government and private engagement in REDD

Actor	Conditions for engagement	Comment	
Government	<p><i>Stable and certain up-front funding</i></p> <ul style="list-style-type: none"> Funding for capacity building and government REDD programs will have to be available up-front. 	Funding to develop REDD capacity or PAMs is unlikely to come from private markets. Depending on the Government's credit rating, borrowing lines, and appetite for risk, Governments may chose to raise funds for REDD implementation on capital markets or get a loan.	
	<p><i>Clear, long-term demand</i></p> <ul style="list-style-type: none"> Confidence that a market will exist for units in the future. 	Long-term demand for REDD units is essential for governments to reorganize development objectives to take REDD into consideration.	
	<p><i>Credit fungibility</i></p> <ul style="list-style-type: none"> Permanent units that are able to be used for compliance in international, regional, and domestic emissions trading schemes the same as units from other sectors. 	Essential to support demand for units and maximize price. Options to ensure permanence include buffer accounts, risk-discounting, insurance. <i>Note:</i> Permanent units may carry additional implications regarding assumption of national liabilities.	
	<p><i>Use of internationally accepted methodologies</i></p> <ul style="list-style-type: none"> Methods used to quantify emission reductions need to be internationally recognized. Includes establishment of reference scenario/baseline. 	Demonstrates integrity of units.	
	<p><i>Sufficient monitoring capacity</i></p> <ul style="list-style-type: none"> A country needs to be able to monitor its forests in accordance with internationally accepted guidance to engage in REDD nationally and generate units based on national performance. 	Capacity needs will be dictated by the complexity and level of sophistication required to meet internationally agreed criteria.	
	<p><i>Political acceptability</i></p> <ul style="list-style-type: none"> REDD implementation need to be politically acceptable to be adopted. 	Most governments will be unlikely to support REDD if it is seen as high risk or not in the country's interest. Condition is applicable to current and future governments and must survive future changes in government.	
	Local/Regional	<p><i>Clear legal title to units</i></p> <ul style="list-style-type: none"> Local or regional government needs assurance it has title to any units it sells. 	Where national approaches are adopted involves approval from central government and assignment of carbon rights to local government. May also involve local stakeholders, depending on local laws.
		<p><i>Direct crediting</i></p> <ul style="list-style-type: none"> Would be in conjunction with or in anticipation of national-level crediting 	Importance corresponds to the level of independence or autonomy state or region has over its own REDD initiatives. Interests of more independent states or regions are more similar to investors or sellers.
		<p><i>Clear, long-term demand</i></p> <ul style="list-style-type: none"> Confidence that a market will exist for units in the future. 	Local governments and authorities need reassurance that the significant effort put into establishing and managing the project will be rewarded in the future. Future protection of forests is also dependent on the existence of a long-term and robust market for forest carbon.
		<p><i>Unit fungibility</i></p> <ul style="list-style-type: none"> Permanent units that are able to be used for compliance in international, regional, and domestic emissions trading schemes the same as units from other sectors. 	Essential to support demand for units and maximize price. Options to ensure permanence include buffer accounts, risk-discounting, insurance.

Actor		Conditions for engagement	Comment
Government	Local/Regional	<p><i>Use of internationally and/or nationally accepted methodologies</i></p> <ul style="list-style-type: none"> • Methods used to quantify emission reductions need to be internationally and/or nationally recognized. • Includes establishment of reference scenario/baseline. 	<p>Demonstrates integrity of units. Where a state or regional government is implementing part of a national plan, national methods will need to be complied with.</p> <p>Need certainty regarding relationship between state and central government's reference scenario/baseline.</p>
		<p><i>Sufficient monitoring capacity</i></p> <ul style="list-style-type: none"> • A regional government may need to be able to monitor its forests in accordance with internationally or nationally accepted guidance. 	<p>Role may be adopted or supported by national government. See also comment under Central Government.</p>
		<p><i>Stable and certain up-front funding</i></p> <ul style="list-style-type: none"> • Funding for REDD capacity building needs to be available to help develop and implement REDD activities. 	<p>See comment for Central Government.</p>
Private	Trader/Broker	<p><i>Clear legal title to units.</i></p> <ul style="list-style-type: none"> • Seller of issued units needs to demonstrate unencumbered ownership of units. 	<p>Once the units have been issued and an owner of the issued units is determined, a lack of legal clarity over the underlying land or forests is less relevant for permanent units (seller liability).</p>
		<p><i>Enforceable sale and purchase contracts</i></p> <ul style="list-style-type: none"> • Must be able to enforce terms of a contract against the counterparty. 	<p>Includes counterparty not expressing any sovereign immunity (if applicable) plus local courts being able to enforce any judgment.</p>
		<p><i>Clear long-term demand</i></p> <ul style="list-style-type: none"> • Confidence that a market will exist for units in the future. 	<p>Time horizon of demand for units may be shorter than other actors invested in REDD activities</p>
	Investor	<p><i>Unit fungibility</i></p> <ul style="list-style-type: none"> • Permanent units that are able to be used for compliance in international, regional, and domestic emissions trading schemes the same as units from other sectors. 	<p>See comments for Local Government.</p>
		<p><i>Independent verification</i></p> <ul style="list-style-type: none"> • Units should be verified by independent third party against internationally accepted methodologies and standards. 	<p>Ensures validity of units being sold.</p>
		<p><i>Clear legal title to land, forest, and units</i></p> <ul style="list-style-type: none"> • Land and forest tenure and use rights should be clear and transparent. • Laws regarding carbon unit ownership and transfer should be clear and transparent. 	<p>Investments into REDD activities will not flow if it is not clear who can own and sell the units and how these rights can be protected. Explicit recognition of carbon units in legislation is preferred but not necessary for engagement.</p>
		<p><i>Enforceable sale and purchase contracts</i></p> <ul style="list-style-type: none"> • Must be able to enforce terms of a contract against the counterparty. 	<p>Includes counterparty not expressing any sovereign immunity (if applicable) plus local courts being able to enforce any judgment.</p>

Actor	Conditions for engagement	Comment
Private Investor	<p><i>Direct project-level crediting</i></p> <ul style="list-style-type: none"> • Could be in conjunction with or instead of national-level crediting. 	<p>Direct project-level crediting removes or reduces sovereign risks. Sovereign risks can include risk that individual projects may not receive units either due to national underperformance, political, or other reasons under national approaches that award units to national government.</p>
	<p><i>Clear long-term demand</i></p> <ul style="list-style-type: none"> • Confidence that a market will exist for units in the future. 	<p>Investors need certainty that a market will exist into the future to ensure they are able to generate a return on their investment.</p>
	<p><i>Unit fungibility</i></p> <ul style="list-style-type: none"> • Permanent units that are able to be used for compliance in international, regional, and domestic emissions trading schemes the same as units from other sectors. 	<p>See comments for Local Government.</p>
	<p><i>Use of internationally accepted methodologies</i></p> <ul style="list-style-type: none"> • Methods used to quantify emission reductions need to be internationally recognized. • Includes establishment of a baseline. 	<p>Demonstrates integrity of units.</p> <p>Relationship between project and any national reference scenario/baseline should be understood.</p>
	<p><i>Independent verification</i></p> <ul style="list-style-type: none"> • Use of independent third-party verification against internationally accepted methodologies and standards. 	<p>Demonstrates environmental integrity when selling the units.</p>
	<p><i>Stakeholder consultation and engagement</i></p> <ul style="list-style-type: none"> • Consultation with local stakeholders ensures the correct people are included in and support the project. 	<p>Stakeholder support is key to ensure long-term viability of the project.</p>
	<p><i>Low host country risk</i></p> <ul style="list-style-type: none"> • Risk that the host country will interfere with the project, e.g., via expropriation (of land, forest, or units), imposing new taxes, revoking permits, etc. 	<p>Host country risk will be associated with risk of political instability, weak governance, and the risk that new governments may not recognize the actions of its predecessors.</p>
	<p><i>Ability to control risk</i></p> <ul style="list-style-type: none"> • Investor will not want to assume liability for risks beyond their control. 	<p>Key condition linked to most other issues for investors including clear legal title, contract enforceability, project-level crediting, long-term demand, and host country risk.</p>
	<p><i>Sufficient monitoring capacity</i></p> <ul style="list-style-type: none"> • Investors will need to be able to monitor its forests in accordance with internationally or nationally accepted guidance. 	<p>Role may be supported by national government. See also comment under Central Government.</p>

Actor	Conditions for engagement	Comment
Private Seller/Community	<p><i>Clear legal title to land, forest, and units</i></p> <ul style="list-style-type: none"> • Land and forest tenure and use rights should be clear and transparent. • Laws regarding carbon unit ownership and transfer should be clear and transparent. 	<p>Seller's need to know who has what rights to units to sell them. This will be affected by underlying rights to the forest and land.</p>
	<p><i>Direct project-level crediting</i></p> <ul style="list-style-type: none"> • Could be in conjunction with or instead of national-level crediting. 	<p>See comments for Investor.</p>
	<p><i>Clear long-term demand</i></p> <ul style="list-style-type: none"> • Confidence that a market will exist for units in the future. 	<p>See comments for Local Government.</p>
	<p><i>Independent verification</i></p> <ul style="list-style-type: none"> • Use of independent third-party verification against internationally accepted methodologies and standards. 	<p>See comments for Investor. <i>Note:</i> Support may be needed during initial verifications.</p>
	<p><i>Stakeholder consultation and engagement</i></p> <ul style="list-style-type: none"> • Consultation with local stakeholders can ensure the correct people are included in and support the project. 	<p>Integral to project development from seller/community view.</p>
	<p><i>Low host country risk</i></p> <ul style="list-style-type: none"> • Risk that the host country will interfere with the project, e.g., via expropriation (of land, forest, or units), imposing new taxes, revoking permits, etc. 	<p>See comments for Investor. Sellers/communities are likely to have a higher risk appetite in this category than investors.</p>
	<p><i>Ability to control risk</i></p> <ul style="list-style-type: none"> • Seller/Community will not want to assume liability for risks beyond their control. See example under Investor. 	<p>See comments for Investor.</p>
	<p><i>Sufficient monitoring capacity</i></p> <ul style="list-style-type: none"> • A local project developer will need to be able to monitor its forests in accordance with internationally or nationally accepted guidance. 	<p>Role may be adopted or supported by Central or Local Government or investor. See also comment under Central Government.</p>
	<p><i>Use of internationally accepted methodologies</i></p> <ul style="list-style-type: none"> • Methods used to quantify emission reductions need to be internationally recognized. • Includes establishment of a baseline. 	<p>Demonstrates integrity of units. Relationship between project and any national reference scenario/baseline should be understood.</p>
	<p><i>Up-front funding</i></p> <ul style="list-style-type: none"> • Up-front funding is needed to help with project development and implementation costs. 	<p>Up-front funding may come from private investors, multilateral agencies, government (domestic or international), or philanthropic donors. Domestic government funding may be limited depending on presence and amount of international donor funding the domestic government may receive.</p>

2.3 REDD and carbon markets

Uncertainties surrounding the supply and demand of REDD units create potential market risks. These risks include (i) high amounts of REDD units flooding the market, (ii) price volatility, and (iii) uncertainties around the timing of REDD units entering the market causing price shocks. Below, we discuss a number of solutions that have been proposed to address these risks. None of the solutions is perfect and all walk a fine line between sound market regulation and stifling markets altogether. A combination of various mechanisms will likely yield the most promising results.

2.3.1 Supply and demand risks

A REDD market mechanism faces the dilemma that participant REDD countries will have to sell REDD units to cover their costs, while potential buying countries have a wide array of choices of how they meet their emission reduction/limitation commitments (QERLCs). While demand is therefore hard to gauge, the supply of REDD units is also uncertain and difficult to assess precisely. Estimates of mitigation potential from REDD range from 2.6 billion tons of carbon dioxide equivalent (GtCO₂e) per year by 2030⁵ to 3.3 GtCO₂e per year by 2030,⁶ to 3.5 GtCO₂e by 2050.⁷ However, mitigation potential is not synonymous with the generation of tradable REDD units. A number of factors will affect the generation of REDD units including how reference levels are set and how easy (or difficult) it is to implement activities that will generate emission reductions and removals in each country.⁸ If demand is set too low or is uncertain, this may negatively affect supply but also open up the risk of market flooding. If demand is set too high, any problems with supply will drive carbon prices to unacceptably high levels. These uncertainties surrounding supply and demand of REDD units produce a number of potential risks including market flooding, price volatility, and timing of unit issuance.

⁵ Eliasch 2008:191.

⁶ Vattenfall 2007.

⁷ Stern 2007:218–219.

⁸ The former will affect the theoretic potential to generate REDD units if, for example, part of the mitigation potential is accounted for under a business-as-usual scenario of reductions. The latter will affect the actual supply of REDD units. Actual supply may be depressed if, for example, the international rules surrounding the generation of REDD units are so complex they create a barrier to enter the market, or a country's REDD policy or governance does not engender the development of REDD activities that generate REDD units.

*Market Flooding.*⁹ A large supply of REDD units may flood the carbon market if (i) the total volume supplied is significant compared to the total market volume; and (ii) there is insufficient demand for REDD units. Flooding the market would depress the price of REDD units and, provided REDD units are fully fungible with existing carbon markets, carbon prices generally. This in turn may (i) decrease the incentive to invest in low-carbon technologies in capped countries, (ii) decrease the incentive for technology transfer and investment in low-carbon technologies in non-capped countries (i.e., countries that generate offsets), and (iii) reduce the amount of income to actors undertaking REDD activities and selling REDD units.¹⁰

Price Volatility. Uncertain supply and/or demand for REDD units will create volatility within the carbon market. While some volatility can be expected, significant price volatility will discourage investment in low-carbon technologies and REDD initiatives as the price incentive for doing so will remain too speculative and unclear. This is particularly relevant for developing country governments if they are expected to rely on income from the sale of units to fund their REDD policies.¹¹ In addition to the potential for policy affecting supply and demand to create volatility, market fundamentals such as weather, fossil fuel prices, energy prices, and other economic conditions will affect carbon market prices.¹² Policy can either compound this volatility or be directed toward mitigating this underlying volatility.¹³

Timing. Ex-post crediting for REDD activities will affect supply and the market in two ways. First, until the ex-post verification has been completed, there will be a degree of uncertainty regarding the actual number of units generated. If monitoring and accounting periods for REDD activities follow similar commitment periods, there will not be any certainty regarding supply of REDD

⁹ It should be noted that some analysis has questioned the validity of the concern over flooding. For example, Cabezas and Keohane 2008 found that allowing REDD units into the carbon market would cause only a modest price depression (13 percent), which would not be significant enough to deter investment in low-carbon technologies.

¹⁰ See Eliasch review 2008:190.

¹¹ For more discussion on this last point see Potvin, Guay, and Pedroni 2008:23–40.

¹² For a discussion of market fundamentals affecting carbon market prices in 2007 see Point Carbon 2008.

¹³ Point Carbon's carbon market survey in 2006 and 2007 both found "politics" to be the primary driver of carbon prices, with the influence of politics increasing from 2006 to 2007. This survey question was not asked in 2008, where the study simply noted that the market was politically driven with supply and demand significantly affected by politics. See Point Carbon 2007 and *ibid*.

units until the commitment period is completed. Second, if participant countries would account for emission reductions and removals at the same time intervals, high amounts of REDD units would reach the market at the same time, driving prices down and leading to significant insecurities and speculation in REDD and other sectors of the carbon market.

2.3.2 Proposed solutions

A number of solutions to address the above supply and demand risks have been proposed. A selection of these proposals is summarized and analyzed below. Each of these possible solutions has advantages and limitations, and many of these can work together. The most appropriate response to market risks may therefore consist of a collection of solutions.

- **More Ambitious QERLCs**

A condition for all creation of tradable, compliance-grade REDD units is the tightening of quantified QERLC. More ambitious commitments would increase demand for REDD units and create the necessary incentives for REDD markets. They would, however, lead to price spikes and increased costs of compliance (and potentially a failure to comply with stricter caps) if the projected REDD units are not in fact generated.

- **Controlling Overall Supply**

An amount of assigned amount units (AAUs) equivalent to the expected number of REDD units to be generated over a given commitment period could be put into an escrow account within a registry account managed by the UNFCCC registry administrator. One AAU would be cancelled for each REDD unit issued. If the account holds more AAUs than REDD units issued, excess AAUs would be released into the market. They could either be sold or assigned to UNFCCC parties with QERLCs according to their percentage in the overall amount of AAUs. If more REDD units are generated than AAUs held in the reserve account, the REDD units could be banked for future periods and taken into account in the context of new rounds of negotiations.

This solution ensures the overall cap on emissions is not affected. It also controls the total supply of units available. This solution would require fungibility between AAUs and REDD units to avoid market distortion.

- **Ensuring Demand**

Demand for REDD units can be guaranteed by purchase commitments. Countries could be obliged to meet a certain percentage of their QERLCs with REDD units. Emission reduction commitments could split into two components, the first being an absolute commitment independent of REDD and the second being specific to REDD. If REDD units are not generated, the commitment could either be reduced to equal the number of REDD units generated or rolled into a second commitment period.

Opening private carbon markets for REDD is another means to ensure demand. Other than sovereign buyers that are exposed to a wide number of political constraints, private market players are likely to embrace cost-efficient offset opportunities. Including REDD in the carbon market will add liquidity to the market, and the more liquid the carbon market is, the higher the certainty of stable levels of demand.

- **Cap Imports of REDD Units**

Limitations on the number of REDD units eligible for compliance can be used to stem a flood of REDD units. This cap could be imposed both within the international rules and within any domestic emissions trading scheme. Limitations on the use of offsets apply to the European Union Greenhouse Gas Emission Trading Scheme (EU ETS) and other domestic and subnational ETSs. These limitations control the use of imported units and help maintain overall market prices within the regulated system.

Caps may shield depression of market prices as they reduce demand for REDD units. At the same time, they remove the incentive to engage in further REDD actions. Caps may therefore depress the price of REDD units compared to other units and reduce the amount of funding going into REDD.

- **Issuance during Commitment Periods**

The problem of a sudden spike in supply associated with ex-post crediting¹⁴ can be mitigated by the continuous issuance of REDD units during commitment periods. REDD units could be issued to authorized and approved subnational activities that have generated certified emission reductions or removals. The continuous issuance of REDD units (via an international body or the participant REDD country) would release units continuously and in quantities that are unlikely to generate sudden shocks. REDD units released on the account of a participating REDD country would have to be deducted from the overall balance of REDD units issued for that country at the end of the commitment period (see Annex Subnational Activities).

- **Price Floors and Ceilings**

A floor price for REDD units could be agreed between the Parties to ensure sufficient funding is available to support REDD initiatives. A price ceiling could limit the exposure of potential buyers to carbon price volatility. The price floor/ceiling could be enforced via the commitment to purchase or sell REDD units when there is oversupply/undersupply. Non-market funds could be used to cover the margin between the market price and the floor or ceiling.

Price floors and ceilings reduce market risk for participant REDD countries and potential buying countries, respectively. The cost of enforcing a fixed floor price for REDD units will, however, be unclear at the time it is agreed. This could be addressed through complementing a floor price with a cap on the total amount of funding spent on maintaining the floor, and/or capping the total number of REDD units allowed on the market.

- **Dual Markets**

Countries could agree to separate QELRCs for REDD and would commit to purchase from particular REDD participant countries. The amount of REDD units REDD participant countries could sell would be limited, although this amount could increase over time if the scheme is successful. This dual market model creates demand for REDD units independently of other GHG emitting sectors. Industrialized countries source a percentage of their post-2012 target via the REDD

¹⁴ Under the CDM, most projects are given the flexibility to verify emission reductions at their own discretion; however, CDM afforestation/reforestation (AR) projects are required to verify sequestration of credits every 5 years. If verification periods are synchronized this could lead to sudden spikes in supply.

market (set by the COP) to prevent disruption of the existing carbon market and manage risk associated with accounting and monitoring uncertainties.¹⁵ Dual markets and the creation of non-fungible REDD units would, however, complicate the linking of REDD markets to other ETSs. Demand, in particular private sector demand, would therefore be uncertain.

2.4 Subnational REDD implementation

There are a number of different approaches to defining subnational REDD activities. Three general categories identified are (i) territory exclusion, (ii) freestanding subnational activities, and (iii) subnational activities within national accounting. A number of interpretations are also possible under this final category. One interpretation involves an international body crediting subnational activities directly, and another involves the national government assuming this role.

Each approach needs to take into account similar issues in their design including (i) conditions for engaging in subnational activities; (ii) monitoring, reporting, and verification; (iii) accounting; and (iv) institutional arrangements.

2.4.1 Categories of subnational approaches to REDD

2.4.1.1 Territory exclusion

In some tropical countries, the central government does not have control over all forest areas within their national boarder. A REDD mechanism could allow those countries to exclude the relevant areas from its national accounting scheme. The country would be responsible for monitoring, reporting, and verification (MRV) of emissions from deforestation and degradation within forests under the control of the government. The reference level or crediting baselines would be set for the covered areas. National monitoring of gross deforestation and degradation could still take place to check for leakage into the excluded areas, but any such leakage would be excluded from the national emissions accounting system. As the country gains control over more areas of its territory, these would be included in the national REDD accounting. Territory exclusion can be combined with 2.4.4.3 below.

¹⁵ This is a simplification of the "Dual Market Approach." See Ogonowski 2007.

2.4.2 Freestanding subnational activities

REDD could be implemented through CDM-type project activities. Reference levels would be set for the project activity. MRV would need to apply high standards and generation of emission reductions would be limited to within the boundary of the subnational activity, except that MRV may occur outside the activity's boundary to capture any leakage. Accounting for climate benefit would relate to the emission reductions of the project minus leakage. Freestanding subnational activities are discussed as a step toward national accounting.

2.4.3 Subnational activities within national accounting

REDD policies are likely to rely on subnational implementation. Countries that monitor and account for REDD at the national scale could either implement, delegate, or authorize subnational activities within the national accounting framework. REDD activities would account for emission reductions against a project specific or regional reference level to take into account local or regionally specific deforestation and degradation rates. REDD units can be rewarded at the national or international level.

• International crediting

Baseline and monitoring methodologies would be set at the project or regional level using methodologies approved internationally or by the host country. A baseline is either determined by those that own the domestic rights to the carbon and verified by a third party (similar to Joint Implementation [JI] Track 2/CDM) or verified by the host country (similar to JI Track 1). Leakage is monitored at the activity level but still needs to be tracked within the country to ensure subnational activities account for only real emission reductions. Units for subnational activities are issued by an international body directly to the authorized entities and deducted from the climate benefits/REDD units recorded at the national level.

• National crediting

Countries could design REDD implementation schemes that include rewarding of benefits against activity-specific baselines. These baselines would be set and approved by the government. Emission reductions below the approved baselines would make the promoters of an activity eligible for a reward agreed to with the government. This could

include the right to receive future REDD units if the activity reduces emissions. Under this scenario, REDD units would be issued to the national government rather than directly to subnational actors. The receipt of the REDD units by subnational actors would depend on the overall success of REDD in the country and the country receiving REDD units.

The problem of ex-post crediting could be circumvented by designing a REDD scheme based on the ex-ante allocation of allowances. Such scheme would, however, entail firmer liabilities by countries participating in REDD.

2.4.4 Design options

2.4.4.1 Conditions for all types of subnational approaches

Conditions for engaging in subnational approaches can be set internationally and/or by each country engaging in subnational REDD activities. This may include both the country hosting an activity and any country buying REDD units the activity may generate.

- At a minimum, all subnational approaches would have to be voluntary and approved by the host country.
- Subnational approaches would also have to meet strict MRV standards to ensure environmental integrity.
- Additional qualitative conditions have also been suggested. These additional criteria include (i) promoting sustainable development; (ii) respecting the rights of and sharing benefits with local communities and indigenous peoples associated with the subnational activity; and (iii) protecting or promoting biodiversity.

2.4.4.2 Monitoring, reporting, and verification (MRV)

There is a wealth of experience with MRV for REDD-type activities at the subnational scale based on both the voluntary markets and the CDM. Given the extent of the experience, methodologies, standards, and guidelines exist for monitoring and reporting such subnational-scale activities that range in size from a few thousand hectares to several hundreds of thousands of hectares. These methodologies and standards, based on good science and IPCC good practice guidance, are designed to attain estimates of carbon units with high levels of accuracy and precision. Standards for verification and verifiers can be built on the existing CDM model.

2.4.4.3 Accounting

REDD activities implemented at the subnational level would have to bring the proof that they generate credible emission reductions that are additional to those emissions that would occur in the absence of the project. Projects would either have to adopt already preexisting regional emission reference levels (baselines) or establish their own emission reference level.

The baseline for subnational or project activities could follow either the CDM model by applying UNFCCC-approved methodologies or adopt country-defined reference levels. Under the current CDM model, baselines are developed in a bottom-up approach by project proponents and approved by the CDM executive board. While this mechanism worked well for industry and energy project activities, it was less successful in setting baselines for afforestation/reforestation activities, which tend to be too project specific with overly complicated requirements. To avoid the problems and delays related to the development of bottom-up baselines, REDD baselines could be developed in a top-down approach.

An alternative approach would be that the host country assigns an emission reference level to each subnational activity it authorizes. This approach may be appropriate as soon as the country has established the relevant data and accounting systems on the national level. It would also be the appropriate manner to establish reference scenarios if subnational activities are implemented under a scheme defined by the country and units are assigned on the national level. Further, a national baseline must be set, and one needs to ensure that project baselines are consistent with the overall baseline for the country.

Leakage associated with subnational REDD activities would have to be deducted from emission reductions attributable for the project. In addition, the government could retain a percentage of units within a national reserve buffer.

2.4.4.4 Institutional arrangements

If subnational activities are implemented as *freestanding project activities*, participating REDD countries have to appoint a national REDD authority that authorizes and approves subnational activities at the project or program level. The country would also have to adopt approval criteria that take into account national priorities and the specific legislative context.

Where the forest resources are state owned, carbon rights would have to be transferred to the applicant entity. Such transfer could either be agreed via contract between the relevant forest authorities or be regulated by law. Where forest resources are managed by regional or local authorities, the contractual arrangement would have to be concluded between the project applicant and the relevant authorities.

If units are being issued on the *international level*, the participating REDD country would not be required to establish and maintain a registry system. Where subnational activities are integrated into a national framework, the country would, however, have to account for the units that are issued for subnational activities, and a registry system would need to be developed to track these units. These units would then be deducted from the units issued to the government at the end of a crediting period.

The risk that more units are issued for subnational activities than eventually to the national government (in the case where subnational activities were successfully implemented but the country as a whole did not reduce deforestation), could be addressed by (i) establishing a national reserve buffer, which receives a percentage of units issued for subnational activities and is managed by the national government; (ii) compensation for the issuance of units for subnational activities from the national reserve buffer; and (iii) in the case where insufficient units accumulated in the buffer, compensate for the remaining units issued by overcompliance in subsequent compliance periods.

In case REDD units are internationally issued, a dedicated UNFCCC body following processes and rules agreed upon by the Parties would have to be established in order to guarantee that the emission reductions are real, measurable, and additional.

If units/rewards are distributed under national schemes, the country would not only account for emission reductions in its national inventories, but also establish a registry infrastructure under which units could be issued to subnational entities. Those entities would have to hold subaccounts in national registries. Alternatively, the country could reward subnational activities in cash rather than units.

Table A2.9: Illustrative performance matrix for a particular REDD action

Identified REDD Action	Criteria	Indicators	Benchmark (related to a particular year)
Reducing illegal timber production	a) Process to identify the underlying causes of illegal logging.	a1) Study completed	Yes
	b) Implementation of policies with sufficient capacity to achieve results	b1) Policy defined and adopted b2) Responsibility and resources allocated for implementation b3) Staff trained and deployed	b1) Yes b2) Yes b2) XX persons trained
	c) Reductions of illegal timber production.	c1) Number of fines issued c2) Proportion of unregistered trucks surveyed at random checkpoints c3) Estimated share of illegal logging	c1) xxx fines issued c2) xxx percent c3) [not measurable yet]

Source: Adapted from Daviet 2008.

2.5 Phase 2 performance indicators

To facilitate the monitoring of results, a Phase 2 financial instrument would be performance based and would, at least in part, depend on the success of prior or current actions. The metrics for the appropriate performance criteria for Phase 2 will depend on the specific REDD actions identified. Some but not all REDD actions may lend themselves to measurement using proxies for GHG emission reduction or enhancement of removals metrics.

The performance evaluation under option 1 of Phase 2 would rely on performance metrics developed and approved as part of the national REDD implementation plans. These plans would define measurable objectives, which would include agreed indicators and benchmarks. GHG and non-GHG metrics can be used to help a participating REDD country define and evaluate how successful the implementation of REDD actions is. GHG metrics help measure progress toward a country's long-term strategic REDD objectives as included in the national REDD strategy. They should also reflect what is important to different stakeholders. They will differ depending on national circumstances of the country and the country's REDD strategy. Table A2.9 is an example of a performance matrix as it could be included in a national REDD implementation plan.

2.6 Structures of global funds

We have reviewed four global funds that may contain design elements that would be relevant for a global fund for REDD and climate change in general. These are the Multilateral Fund (MLF) of the Montreal Protocol; the Global Environment Facility (GEF); the Global Fund for AIDS, TB and Malaria (called here Global Health Fund); and the Adaptation Fund under the UNFCCC. We have chosen those four funds because they are potential candidates to play a role in the REDD governance (GEF), they describe a successful model of cooperation with broad ownership of developing and developed countries (MLF), they involve civil society stakeholders in their governance (Global Health Fund), or reflect new governance models for funds established under the UNFCCC (the Adaptation Fund). The following main elements of these funds are:

- their financial sources;
- their governance; and
- their implementation arrangements.

Scheduled **financial replenishment and capitalization** is common in the MLF, GEF, and Global Health Fund to increase certainty of available funding. Although still not operational, the proposed capitalization method of the Adaptation Fund is through a percentage of certified emission reduction (CER) sales of CDM projects.

In the case of the MLF and GEF Boards, **governance** power is in Boards, with equal participation of developed and developing countries, while the Global Health Fund and Adaptation Fund prioritize developing country representation where the funds will be directed. The GEF blends voting power according to constituency and to shares of contributions made, while the Adaptation and Global Health Funds give one vote per country. The Funds use expert panels to advise boards and evaluate how actions and guidelines contribute to global goals and priorities, while the Adaptation Board has the ability to establish these.

The MLF has a Secretariat that is linked to the Vienna Convention through which the mandate to establish the fund arose, and is a possible model for an independent fund structure that remains linked to the UNFCCC. Similarly, the Adaptation Fund has direct linkage to the UNFCCC and the Kyoto Protocol. If there is a discrepancy between the rules of the Adaptation Fund and the Kyoto Protocol, it is the Protocol rules that prevail.

Participative decision making is achieved in the GEF via a Universal Assembly that seeks to impact the GEF direction. In the Global Health Fund a decentralized process of prioritizing funding needs, and distributing

funds and coordination takes place via in-country stakeholders who then also carry out funded activities. Public participation and observation are strong in the GEF, the Adaptation Fund, and the Global Health Fund, and public information sharing and transparency procedures are also followed.

Implementation of grant-funded work is carried out by entities “in-country” both in the case of the Adaption Fund and the Global Health Fund. In the case of the latter fund, a more decentralized, country-owned process is in place through local recipient organizations leading proposal development and program delivery. The Adaptation Fund allows executing entities that are from the country of proposed activity to directly access funds as long as they are approved by the Adaptation Fund Board. The GEF relies on approved implementation and executing agencies, which are multi- or bilateral development institutions.

The MLF enables countries to access implementation funding based on specific metrics that relate to the reduction of ozone-depleting substances. The Global Health Fund requires programs proposed by country committees to meet national development plans and strategies. Performance measures are evaluated both at the country level and at the Global Fund level prior to continued disbursement.

Table A2.10: Comparison of global funds

	Multilateral Fund (MLF) of the Montreal Protocol	Global Environment Facility (GEF)	Global Fund for AIDS, TB, and Malaria	Adaptation Fund
Origin and size	Created in 1990, has undergone 7 replenishments amounting to US\$2.4 billion for the period up through 2008. Expenditures disbursed to 140 countries.	Created in 1991 providing \$8.26 billion to 165 countries and leveraging \$33.7 billion in co-financing.	Since 2002, 45 countries, private foundations, corporations and individuals pledged about US\$12.5 billion for programs in 140 countries.	Proposed in 2001, expected to begin operating 2009.
Purpose	Financial mechanism under the Montreal Protocol that finances the incremental costs of phasing out of ozone-depleting substances.	Serve as financial mechanism under multilateral environmental agreements (UNCBD, UNFCCC, the Stockholm Convention, and UNCCD). The GEF is also the designated manager for the LDCF and SDCF.	Global financial mechanism to attract, manage, and disburse resources to strengthen health systems at country level working toward a world free of AIDS, TB, and malaria.	Fund established under the Kyoto Protocol to finance adaptation projects and programs in developing countries that are Parties to the Kyoto Protocol.

	Multilateral Fund (MLF) of the Montreal Protocol	Global Environment Facility (GEF)	Global Fund for AIDS, TB, and Malaria	Adaptation Fund
Capitalization and fund replenishment	Replenishment based on voluntary contributions from industrialized nations.	Replenishment based on voluntary contribution from donor countries (industrial + developing countries) every 4 years.	Voluntary ad-hoc system now changing to a model of periodic replenishments. Also uses debt-to-health swaps.	Funding planned from 2% of certified emission reductions (CERs) issued for a CDM project activity. Concern that shortfalls will have to be covered from alternative funding mechanisms.
Governance	<p>*Executive Committee comprised of 14 representatives, 7 from developed and 7 from developing countries.</p> <p>*Ozone Secretariat linked to the Convention administers operational aspects of the MLF.</p> <p>*UNEP's Technical Economic Assessment Panel (TEAP) is a standing subsidiary body that provides scientific and technological assessments.</p>	<p>*GEF Council is main governing body that functions as independent Board of Directors. It includes 32 members (16 developing, 14 developed, and 2 transition countries) and votes by consensus, based on both constituencies and shares. Open door to civil society.</p> <p>*Universal Assembly with representatives of member countries reviews and evaluates GEF operation and approves amendments to GEF rules.</p> <p>*Secretariat coordinates work program and implementation.</p> <p>*Scientific and Tech Advisory Panel of 6 experts for strategy and programs.</p>	<p>*Global Fund Board includes 20 voting members (7 WHO regional reps from LDCs, 8 Donors, 5 civil soc (incl. private sector). One country, one vote.</p> <p>*Global Fund Secretariat manages the grant portfolio, executes Board's policies, fundraises, and administers Fund.</p> <p>*Technical Review Panel provides independent review of proposals for Board.</p> <p>All records public.</p>	<p>The Adaptation Fund Board is composed of 16 members with one country, one vote and a majority of non-Annex 1 parties.</p> <p>The Board will supervise and manage the Adaptation Fund under the authority and guidance of the UNFCCC. Conference of the parties serving as the Meeting of the Parties.</p> <p>Decisions by the Board are taken by consensus; if no agreement has been reached, decisions are by taken by a two-thirds majority of the members present at the meeting on the basis of one member, one vote.</p> <p>The Board can create expert committees and panels to serve as advisors.</p>
Implementing agencies	Four implementing agencies where investment-oriented projects have been led by UNDP, UNIDO, or WB and Non-investment projects led by UNEP. UNEP also serves as fund treasurer. Cooperation with bilateral agencies.	Three implementing agencies: the World Bank, UNDP, UNEP, and a number of executing agencies: IFAD, FAO, UNIDO, and four regional development banks IADB, AfDB, ADB, and EBRD. WB serves as trustee and operational home of the fund.	Global Fund is not present in countries—the Country Coordinating Mechanism in each country (participation of all stakeholders) organizes grant applications and distribution, monitors implementation of programs via the Principal Recipient Organization.	Applicants either develop and implement activities through direct access with in-country executing entity or go through an implementing entity recognized by the Adaptation Fund Board. Provisional operational policies recommend a country coordination mechanism under auspices of UNFCCC national focal points who endorse proposals for funding by Adaptation Fund.

	Multilateral Fund (MLF) of the Montreal Protocol	Global Environment Facility (GEF)	Global Fund for AIDS, TB, and Malaria	Adaptation Fund
Eligibility	Developing country Parties to the Protocol with an annual per capita consumption and production of ozone-depleting substances of less than 0.3 kg.	Parties eligible for assistance under the respective convention, and via focal areas (targeting biodiversity, climate change, international waters and integrated ecosystem management.)	Low-income, high disease burden countries. Programs developed by recipient in line with national strategic health plans. Must involve all areas of society with a stake in the development process.	Not fully developed: Non-Annex I country Parties. Emphasis will be on countries that are particularly vulnerable to climate change.
Fund Disbursal	To receive Fund support, a country develops a country program for ODA phase-out, which is a prerequisite for investment support from the Fund. Developing countries must also submit action plans, including a prospective regulatory framework and legislation supporting ODS phase-out.	Funding of incremental costs, which are the extra costs incurred in the process of redesigning an activity vis-à-vis a baseline plan—which is focused on achieving national benefits—in order to address global environmental concerns.	Funding is performance based linking disbursements of tranches of the grant to periodic demonstrations of programmatic progress and financial accountability. Considers programs funded via debt-to-health conversion.	Provisional operational policies state that financing is on a full adaptation cost basis of projects and programs that address the adverse effects of climate change.

Source: MLF data sources include: <http://www.multilateralfund.org/homepage.htm>, <http://go.worldbank.org/GJKI9UF6Z0>; and “The Montreal Protocol: Partnerships Changing the World” 2005 at http://exchange.unido.org/cmsupload/1509_2791686912_ozone.pdf; GEF data sources include: <http://www.gefweb.org/default.aspx>; Global Fund for Aids data sources include: <http://www.theglobalfund.org/en/>; ActionAid 2007; International Center for Research on Women 2005; Wigell 2008; Adaptation Fund Data sources: <http://adaptation-fund.org/home.html>, <http://www.climatefundupdate.org/listing/adaptation-fund>, http://adaptation-fund.org/images/AFB.B.1.9_Provisional_Operational_Policies_and_Guidelines_February_29_2008.pdf.

Annex 3: Options for Setting Reference Levels (RLs)

3.1 Examples of procedures for setting RLs

Decisions on the procedures of how to set reference levels (RLs) could be informed by similar experiences in the past. Table A3.1 outlines alternative processes, with historical examples and an assessment of their effectiveness.

3.2 Alternative approaches for setting reference levels

3.2.1 A modelling approach

An alternative to using historical deforestation as the starting point for setting RLs is to predict deforestation (and possibly also degradation) using models. The literature on cross-country deforestation regression models has included a number of variables, and some of these are potential candidates for inclusion in a simulation

model for setting RLs.¹⁶ These include population density and growth, income level and growth (i.e., GDP/capita and economic growth), forest area, commodity prices, governance variables, and location (tropical and regional).

Historical deforestation—although imperfect—is the best predictor available in the short to medium term, thus one might argue that there is no clear-cut distinction between a “historical” approach and a modeling approach. The key questions appear to be: (i) to what extent should RLs be model/formula determined, and (ii) which variables should enter that formula? While including additional factors might improve predictions, it will become more complex and less intuitive as a starting point for RL negotiations.

One problem with the modelling approach is that it is based on *predicted* values of, for example, population and economic growth and commodity prices. An extension of this approach, suggested by Motel, Pirard, and Combes

¹⁶ See Kaimowitz and Angelsen 1998; Geist and Lambin 2002; Rudel 2005; and Chomitz et al. 2007.

Table A3.1: Existing procedures for decisions related to country-specific commitments and RLs

Level of decision making	Process	Historical examples	Effectiveness in reaching timely decisions	Effectiveness in reaching proper decisions
Political level	Allocation principles are discussed for some time. A table of country-specific values is prepared by applying a formula reflecting broadly acceptable principles. Politicians review special national circumstances not captured by the formula, and amend the values accordingly until they agree on the whole lot (to ensure global additionality).	Ministers setting QELROs for Annex I Parties in Kyoto (1997).	Succeeded, although some Parties had second thoughts later on.	Agreement on inappropriate levels led to hot air, breach of commitment, and to requests to reopen agreed values at later stages.
		EU Ministers sharing the burden of the joint effort agreed in Kyoto.	Succeeded.	Succeeded.
		Ministers setting forest management caps for Annex I Parties in The Hague (2000), together with dozens of other negotiation items.	Failed.	—

Level of decision making	Process	Historical examples	Effectiveness in reaching timely decisions	Effectiveness in reaching proper decisions
Government experts level	Same as above, but negotiations are handled at expert level, subject to approval by the political level.	LULUCF experts setting forest management caps for Annex I Parties in Bonn (2001).	Succeeded, although some Parties requested changes later on.	Agreement at sub-political level led to lack of commitment to the outcome and requests to reopen agreed values at a later stage.
Political or government experts level—case by case	National submission to the COP by the Party having an issue to be dealt with. Consideration of the issue under the subsidiary body for implementation (SBI). An informal group of individual government experts is tasked with coming up with a proposed compromise way forward. Report back to SBI and COP for a decision on the matter. Deal making may require high-level political involvement to hurry decisions, if needed.	Consideration of specific national circumstances arising from Parties' commitments (Iceland's single project, Croatia's base-year emissions, Russia's and Italy's forest management cap).	Succeeded, although indecisiveness, the ad-hoc nature of the process, and the lack of political involvement can cause disproportionate delays.	The risk of agreement on inappropriate values is mitigated by direct expert scrutiny at the cost of delaying decisions until confidence in data is sufficiently high.
Administrative level—case by case	Agreement on modalities and procedures at COP level, based on SBSTA recommendation. Agreement on methodologies and templates at the level of a dedicated committee acting under the authority of the COP. Proponents submissions on the basis of agreed methodologies and templates. Independent reviewers validating the proper application of the methodology. The committee endorsing the submission, possibly after further review.	Designated operational entities and the CDM Executive Board validating and registering CDM project baselines.	Succeeded, although indecisiveness can cause major delays at times. Lack of appeal procedure avoids reopening decisions.	The risk of agreement on inappropriate values is mitigated by the smaller global consequences of each project-specific decision.

Source: MLF data sources include: <http://www.multilateralfund.org/homepage.htm>, <http://go.worldbank.org/GJKI9UF6Z0>; and "The Montreal Protocol: Partnerships Changing the World" 2005 at http://exchange.unido.org/cmsupload/1509_2791686912_ozone.pdf; GEF data sources include: <http://www.gefweb.org/default.aspx>; Global Fund for Aids data sources include: <http://www.theglobalfund.org/en/>; ActionAid 2007; International Center for Research on Women 2005; Wigell 2008; Adaptation Fund Data sources: <http://adaptation-fund.org/home.html>, <http://www.climatefundupdate.org/listing/adaptation-fund>, http://adaptation-fund.org/images/AFB.B.1.9_Provisional_Operational_Policies_and_Guidelines_February_29_2008.pdf.

(2008), is to estimate the impact of government policies ex post, that is, at the end of the crediting period when that information is available. Countries then get rewarded for good policies and efforts (“Compensated Successful Effort”). This can be operationalized by using indexed RLs, i.e., open up for an ex-post adjustment of RLs based on the observed level of, for example, key commodity prices. While such an approach has some intuitive appeal, it risks complicating the process further. Also, the problem of finding good variables for indexing remains.

3.2.2 Stock-based approaches

The RL discussion in Chapter 3 assumes an emission-based approach. An alternative is a stock-based approach. First, a clarification of terminology might be needed, as stock-based approaches can refer to at least three different things: (i) stock-based *measurement*: a method for estimating emissions from deforestation and degradation by calculating the forest carbon stock at different points in time; (ii) stock-based *payments*: a mechanism where incentives are linked to the absolute level of the forest stock, rather than *changes* in the stock (= emissions); and (iii) stock-based *reference levels*: including forest stock (or forest area as a proxy) as a variable in an RL formula. We use the term stock-based approach in the second meaning.

This report favorably discusses (i) and (iii), while one might question the overall effectiveness of stock-based payments. As a general principle, incentives should be linked directly to climate impacts, namely reduced emissions/higher removals. This is in line with the Intergovernmental Panel on Climate Change (IPCC) guidelines and UNFCCC focus.

In a funds-based approach (Phase 2), where stock-based payment is conceivable, a major risk is that large amounts are being paid to forested areas that are not under threat, thus “diluting” the funds available for forests under threat and yielding low additionality and efficiency in terms of emissions reductions per dollar spent. If REDD credits are to be integrated into international carbon markets (Phase 3), the commodity to be traded is certified emissions reductions, not maintenance of stocks.

The emission-based approach and the RL formula proposed in this report yields strong incentives for forest conservation. By including forest area as one criterion for setting RLs, due consideration can be given to HFLD countries, based both on a hypothesis that deforestation

is likely to increase in these countries in a BAU scenario, and the need to include them to avoid nonparticipation and international leakage. Thus, although the distributional implications are similar to what would occur in a mechanism with stock-based payments, there are two important differences: (i) the justification is that this gives a better prediction of the BAU baselines, and (ii) the overall effectiveness is higher as the incentives are directly linked to what matters for the climate.

3.3 A description of the OSIRIS model

The scenarios presented in this report derive from the Open Source Impacts of REDD Incentives Spreadsheet (OSIRIS) model (see Figure A3.1). OSIRIS is a publicly accessible, open-source economic model that enables quantitative comparison of REDD design options, including different reference levels. The model is parameterized using the best currently available global data sets on factors relevant to REDD, including forest and soil carbon stocks, forest cover, and opportunity cost of forest for agriculture and timber. Many of the assumptions and uncertainties are made explicit and, in most cases, can be explored by varying flexible model parameters. The model and data sets are publicly available at www.conservation.org/osiris.

Yet, the differences between different models should be noted, and these yield quite different estimates of, for example, the costs of REDD, cf. Kindermann et al. (2008) and Annex 2.1.2. One major source of this uncertainty relates to the opportunity costs of conservation of forest under threat, where both availability of high-quality data and differences in methodological approaches are areas of concern (see Pagiola and Bosquet 2009).

The analytical framework for OSIRIS is a one-period global partial equilibrium market for a single commodity, adapted from Murray, McCarl, and Lee (2004). The commodity in the OSIRIS model is a composite index of agricultural and timber output produced on one hectare of land cleared from the tropical forest frontier (“frontier land agricultural output”). Demand for frontier land agricultural output is global, with underlying national demand for agriculture and timber perfectly substitutable between domestic and imported agricultural production. In each of 79 tropical or developing countries thought to be potentially eligible for REDD, a national supply curve for frontier land agricultural output in the absence of REDD incentives is constructed from spatially

explicit estimates of returns from agriculture and timber. National supply curves sum horizontally to determine a global supply curve for frontier land agricultural output.

Global supply and demand curves intersect to determine the economic return to frontier land agricultural output and the quantity of annual deforestation. These economic returns determine the price of frontier agricultural land, which in turn determines national quantities of deforestation, as each country chooses a quantity of frontier agricultural land to simultaneously maximize returns from agriculture and REDD. The impact of REDD incentives on deforestation is modeled by shifting national-level supply curves inward, as return to frontier land agricultural output is diminished by the opportunity cost of obtaining REDD credits from standing forest. The inwardly shifted global supply curve intersects with the global demand curve to predict the global increase in the return to frontier land agricultural output, and its impacts on quantity of frontier land supplied by each country.

In this example, REDD incentives for countries I and II shift the supply curves for frontier land agricultural output upward. These countries reduce the quantity of frontier land agricultural output supplied. The slope of the global demand for frontier land agricultural output

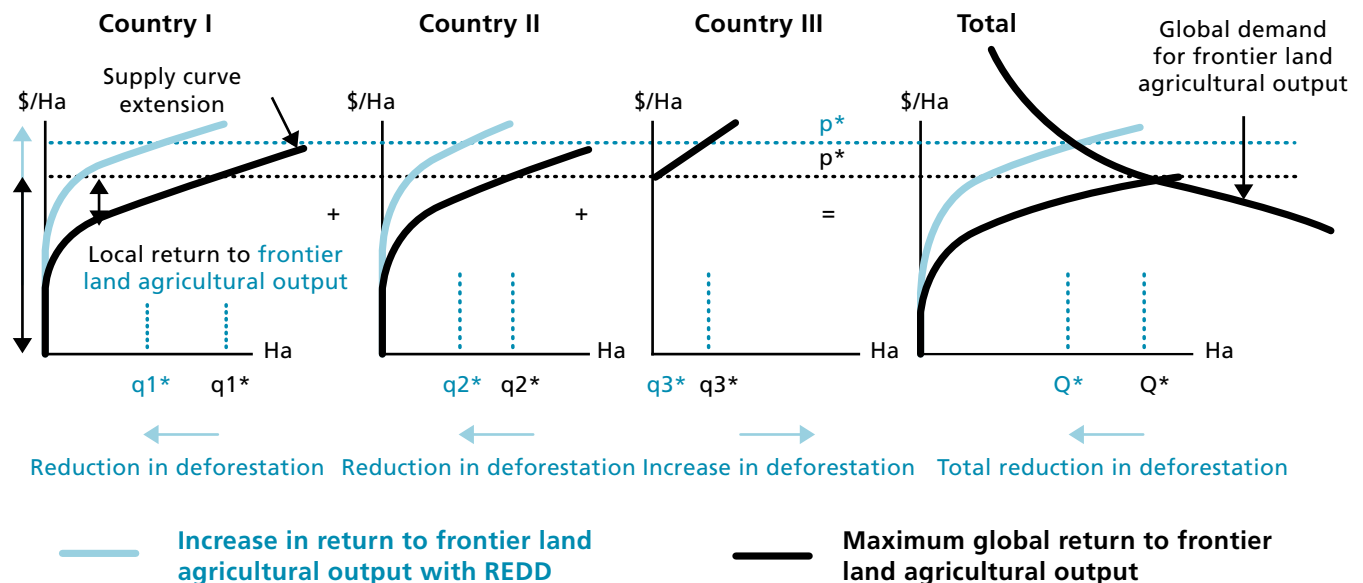
determines the extent of the global increase in the return to agricultural land output, which causes Country III, which does not receive REDD incentives, to increase frontier agricultural production. Countries' rate of deforestation with REDD are used to calculate emissions from deforestation and REDD revenue.

3.4 The risk of international leakage with limited participation

If only a subset of forest nations participate in an international REDD mechanism, there is a risk that deforesting activities will shift to nonparticipating countries. The channels of such international leakage can take different forms (Wunder 2008): markets (output, labor and capital), income/profit generation, technological innovations, or ecological conditions. The causal chain of leakage in the OSIRIS model is through the agricultural commodity market: (i) a decrease in the quantity of frontier agricultural land supplied by participating countries as REDD renders forest more economically valuable relative to agriculture, (ii) an increase in the international market price of affected commodities due to this decrease in supply, and thus (iii) an increase in return to frontier agricultural land and more deforestation of previously marginal frontier land in nonparticipating countries.

Figure A3.1: A working example of OSIRIS

Market for frontier land agricultural output (Without and with REDD incentives)



Source: Busch et al. 2009.

The extent of such international leakage depends on the degree to which the sources of deforestation are mobile, the elasticity of demand for agricultural commodities, and the degree to which these agricultural commodities are or can be produced outside of the forest frontier. Recent analysis suggests both that a number of key sources of deforestation are indeed mobile (Murray 2008), and that the relevant demand elasticity for many agricultural commodities may be fairly low (Roberts and Schlenker 2009), suggesting significant potential for international leakage. But this will vary among countries and regions depending on the main sources of deforestation and the international market linkage. Leakage is likely to be smaller when, for example, commodities produced by frontier agriculture are primarily for subsistence or local markets.

Analyses using OSIRIS and other models demonstrate that international leakage would undermine the effectiveness of REDD policies in achieving emissions reductions. Leakage can be avoided if the REDD mechanism is explicitly designed to provide incentives for emissions avoidance to all forest countries. This can, for example, be achieved by providing higher-than-historical RLs to countries with historically low deforestation rates, in particular the High Forest Cover with Low Rates of Deforestation (HFLD) group (see Busch et al. 2009).

Scenarios modeled with OSIRIS in a market setting suggest that REDD policies excluding incentives for countries with historically low deforestation result in increased emissions in those countries for most sets of policy incentives and economic conditions. Policy designs that provide well-calibrated incentives to all countries can control this leakage, resulting in greater overall emissions reduction through REDD. It is, however, unclear to what extent such leakage concern can be a separate argument in the UNFCCC negotiations for giving higher reference levels to certain countries. But, the existence of international leakage points to the need to get as many countries as possible included in the REDD agreement, and modifying RLs might be a way to achieve this. In the recent past, for example, a modification of the forest management caps for certain Annex I countries was needed to make them join the Kyoto Protocol and thereby reach the minimum percentage of participation for the protocol to take effect.

The existence of international leakage through higher agricultural prices from successful REDD efforts also drives up the costs of REDD. Section 3.5.3 below illustrates the cost implications of different assumptions about the agricultural demand elasticity.

3.5 Options simulated

Different scenarios were created by varying different sets of assumptions:

1. The criteria for setting country RLs:
 - a. RL = national historical deforestation (NHD) (100 percent weight)
 - b. RL = NHD + forest cover (“quotas” equal to 20 percent of global historical deforestation allocated to countries with more than 50 percent forest cover)
 - c. RL = NHD + GDP/capita (“quotas” equal to 10 percent of global historical deforestation allocated to countries with GDP per capita below USD 500)
 - d. RL = NHD + forest cover + GDP/capita [“quotas” as listed for both (b) and (c)]
2. The global additionality (scaling) factor:
 - a. Zero reduction in global RL compared to global business as usual (global additionality factor = 100 percent)
 - b. Stepwise reductions (global additionality factors set to 90, 80, 70, 60, and 50 percent)
3. The magnitude of REDD funding:
 - a. USD 5 billion per year
 - b. USD 10 billion per year
 - c. USD 20 billion per year
4. The degree of international leakage:
 - a. Low leakage (global agricultural demand elasticity ($e = 10$))
 - b. Medium leakage ($e = 3$)
 - c. High leakage ($e = 1$).

These assumptions would generate a large number of scenarios ($4 \times 6 \times 3 \times 3 = 216$), and only a few are presented to demonstrate the broad implications of different options and assumptions.

Table A3.2: Implications of different criteria for RLs

	Option 1	Option 2	Option 3	Option 4
	Nat. Def.	Nat. Def. + For. Cover	Nat. Def.+ GDP/Cap	Nat. Def. + For. Cover + GDP/Cap
Emission reductions (% of BAU)	-42 %	-39 %	-34 %	-39 %
HFLD countries (>50% for. cover, < 0.5% def.rate)	-13 %	-49 %	-32 %	-47 %
HFHD countries (>50% for. cover, >0.5% def.rate)	-43 %	-45 %	-14 %	-40 %
LFLD countries (<50% for. cover, < 0.5% def.rate)	3 %	30 %	-8 %	25 %
LFHD countries (<50% for. cover, >0.5% def.rate)	-51 %	-39 %	-54 %	-43 %
Lowest-income countries (<USD 500/capita)	-24 %	-17 %	-46 %	-36 %
Low-income countries (USD 500–2,000/capita)	-50 %	-47 %	-49 %	-44 %
Medium-high income countries (>USD 2,000/capita)	-39 %	-36 %	-14 %	-34 %
Gross transfer (USD mill)	5 026	4 979	4 995	4 998
HFLD	281	1 053	974	1 331
HFHD	1 837	2 189	565	1 692
LFLD	148	—	306	125
LFHD	2 759	1 737	3 151	1 851
Lowest income	403	455	1 669	1 221
Low income	2 768	2 207	2 635	1 882
Medium-high income	1 855	2 316	690	1 895
Net gain (USD mill)	3 144	3 543	3 806	3 568
HFLD	181	888	825	1 164
HFHD	969	1 410	98	99
LFLD	75	—	243	119
LFHD	1 920	1 244	2 340	1 286
Lowest income	245	350	1 413	1 032
Low income	1 933	1 590	1 979	1 322
Medium-high income	967	1 603	414	1 214
Carbon price (USD/t CO₂)	1,46	1,43	1,62	1,41

HFHD = High Forest Cover with High Rates of Deforestation.
HFLD = High Forest Cover with Low Rates of Deforestation.

LFHD = Low Forest Cover with High Rates of Deforestation.
LFLD = Low Forest Cover with Low Rates of Deforestation.

In all the simulations, the starting point is a fixed amount of REDD funding. The carbon price (USD/tCO₂) is then adjusted to generate this level of REDD transfer. This approach does *not* indicate a preference for a fund approach, but should rather be seen as a pedagogical approach to explore the implications of different levels of funding. The simplifying assumption of the model is, however, that these funds are allocated such that the marginal costs of REDD are the same in all participating countries.

3.5.1 Implications of different criteria for RL setting

The first set of analysis shows the implications on overall emissions reductions and on the distribution across groups of countries for different options in terms of the three main criteria for setting RLs: national historical deforestation, forest cover, and GDP/capita. The results are presented in Table A3.2.¹⁷ The countries contained within each category are listed in Table A3.3.

Table A3.2 illustrates how the introduction of additional criteria to historical national deforestation will change the distribution of REDD funds. Option 2 introduces forest cover as a criterion, and high forest countries (HFHD, HFLD) will naturally gain. In relative terms, the gain is particularly large for the HFLD countries, as their potential is limited when past deforestation is the only criterion. The higher incentives given to HFLD countries also yield a significantly higher reduction in emissions from this group. Note, however, that in absolute terms the main emission reductions still come from the high-deforesting countries (HFHD, LFHD) (figures not presented here).

Option 3 allocates higher RLs to countries with GDP per capita below USD 500, equivalent to 10 percent of total global deforestation. This rather modest reallocation of RLs yields a dramatic increase in the REDD transfers to the lowest-income countries from USD 0.4 to 1.7 billion per year. On a per capita basis, the increase is from USD 0.61 to USD 2.51 between options 1 and 3 (the average to all participating REDD countries is about one dollar). One also notes that LFHD has a substantial net gain in this scenario.

¹⁷ Additional assumptions made in this table are: the global additionality factor is set to 100 percent, the total REDD funding is USD 5 billion per year, and a medium-level international leakage is assumed.

However, the poorest countries are responsible for only 13 percent of forestry emissions, thus there is a sharp decline in the overall emissions reductions from this reallocation of funds. The reduction is mirrored by an increase in net benefits (REDD rent) to participating countries. This suggests that there might be a tradeoff between the objectives of poverty reduction/development and global carbon emission reductions, simply because the very poorest countries have a small share of the global emissions.

Option 4 includes both forest cover and GDP per capita as criteria. The outcomes lies between options 3 and 4, with both high forest cover and poor countries gaining. The global emission reduction is, however, reduced, pointing again to the existence of tradeoffs.

The current version of the model is not well suited to fully predict magnitudes of overall emissions by changing the criteria for setting RLs, but only the relative emissions and distributional implications. Yet, the analysis demonstrates one general point: *beyond National Historical Deforestation (NHD), RL criteria that are introduced for reasons other than to improve the business as usual (BAU) baseline tend to reduce effectiveness (= overall emission reductions for a given amount of REDD funds).* However, a reference level below BAU may make some countries opt out of an agreement (which might increase international leakage).

Table A3.3: Countries contained within categories of high/low forests and high/low deforestation

Country	Category
HFHD countries	
Brazil	HFHD
Cambodia	HFHD
Democratic Peoples Republic of Korea	HFHD
Equatorial Guinea	HFHD
Malaysia	HFHD
Solomon Islands	HFHD
Timor-Leste	HFHD
Venezuela	HFHD
Zambia	HFHD

HFLD countries	
Belize	HFLD
Bhutan	HFLD
Bolivia	HFLD
Colombia	HFLD
Congo	HFLD
Democratic Republic of the Congo	HFLD
Gabon	HFLD
Guinea-Bissau	HFLD
Guyana	HFLD
Laos	HFLD
Panama	HFLD
Papua New Guinea	HFLD
Peru	HFLD
Republic of Korea	HFLD
Suriname	HFLD
LFHD countries	
Afghanistan	LFHD
Benin	LFHD
Botswana	LFHD
Burundi	LFHD
Cameroon	LFHD
Chad	LFHD
Ecuador	LFHD
El Salvador	LFHD
Ethiopia	LFHD
Ghana	LFHD
Guatemala	LFHD
Guinea	LFHD

Haiti	LFHD
Honduras	LFHD
Indonesia	LFHD
Liberia	LFHD
Malawi	LFHD
Mali	LFHD
Mauritania	LFHD
Mongolia	LFHD
Myanmar(Burma)	LFHD
Namibia	LFHD
Nepal	LFHD
Nicaragua	LFHD
Niger	LFHD
Nigeria	LFHD
Pakistan	LFHD
Paraguay	LFHD
Philippines	LFHD
Senegal	LFHD
Sierra Leone	LFHD
Sri Lanka	LFHD
Sudan	LFHD
Togo	LFHD
Uganda	LFHD
United Republic of Tanzania	LFHD
Zimbabwe	LFHD
LFLD countries	
Angola	LFLD
Argentina	LFLD
Bangladesh	LFLD

Burkina Faso	LFLD
Central African Republic	LFLD
Chile	LFLD
China	LFLD
Costa Rica	LFLD
Cote d'Ivoire	LFLD
Cuba	LFLD
Dominican Republic	LFLD
Eritrea	LFLD
The Gambia	LFLD
India	LFLD
Iran	LFLD
Jamaica	LFLD
Kenya	LFLD
Lesotho	LFLD
Madagascar	LFLD
Mexico	LFLD
Mozambique	LFLD
Rwanda	LFLD
Sao Tome and Principe	LFLD
South Africa	LFLD
Swaziland	LFLD
Thailand	LFLD
Uruguay	LFLD
Vietnam	LFLD
Cutoffs:	
Forest cover = 50% (2005)	
Annual deforestation rate = 0.5% (2000–2005)	

Table A3.4: Countries and GDP per capita

Country	GDP per capita, 2007 (\$)
Lowest income (= < USD 500/capita)	
Burundi	115
Democratic Republic of the Congo	144
Liberia	193
Guinea-Bissau	211
Ethiopia	245
Eritrea	248
Zimbabwe	255
Malawi	255
Sierra Leone	286
Niger	294
Rwanda	341
Uganda	363
Mozambique	363
Nepal	363
Timor-Leste	371
Madagascar	372
The Gambia	377
Togo	379
Central African Republic	394
United Republic of Tanzania	400
Afghanistan	424
Bangladesh	427
Burkina Faso	458
Guinea	487
Cuba	500
Democratic Peoples Republic of Korea	500

Myanmar(Burma)	500
Low income (USD 500–USD 2,000/capita)	
Mali	556
Cambodia	597
Benin	601
Haiti	638
Ghana	650
Chad	658
Laos	684
Solomon Islands	745
Kenya	786
Lesotho	798
Vietnam	836
Mauritania	847
Pakistan	884
Senegal	898
Sao Tome and Principe	918
Zambia	953
Nicaragua	1,013
Cote d'Ivoire	1,016
India	1,042
Cameroon	1,114
Nigeria	1,120
Sudan	1,235
Bolivia	1,378
Guyana	1,413
Mongolia	1,491
Sri Lanka	1,622
Philippines	1,640
Bhutan	1,668
Honduras	1,732
Papua New Guinea	1,874
Indonesia	1,918

Paraguay	1,961
Medium-high income (> USD 2,000/capita)	
Congo	2,030
China	2,485
Guatemala	2,505
Swaziland	2,569
El Salvador	2,950
Namibia	3,250
Ecuador	3,312
Angola	3,440
Colombia	3,729
Dominican Republic	3,762
Iran	3,815
Thailand	3,851
Peru	3,910
Jamaica	4,012
Belize	4,191
Suriname	4,893
Costa Rica	5,653
South Africa	5,833
Panama	5,908
Botswana	6,263
Argentina	6,641
Malaysia	6,807
Brazil	6,859
Uruguay	6,956
Gabon	8,011
Venezuela	8,303
Mexico	8,486
Chile	9,877
Equatorial Guinea	19,533
Republic of Korea	19,983

3.5.2 Implications of different global additionality factors

The second main question assessed relates to the scaling of the global RL, i.e., a downward adjustment of the global additionality factor. To what extent is the global reference level (sum of individual country reference levels) set below the global BAU level (= global historical deforestation in the model)?

Scaling down the global reference level has two contradictory effects in the model: First, setting reference emission levels below the BAU means that participating countries will not be paid for the first tons of emissions reductions. From a global perspective, this means that more funds will be spent to pay for the actual costs of reductions. The carbon price will be higher, thus the incentives on the margin for participating counties will be higher. Second, the fact that countries are not paid for their initial emissions reductions means that some might choose not to participate. The costs of these uncompensated reductions might be larger than the net benefits of the compensated reductions.

The net effect of these contradictory effects on global emissions reductions is illustrated in Figure A3.2. Country RLs are initially set equal to their national historical deforestation (option 1 in the previous section). Then, the RLs are gradually reduced down to 50 percent of that level.

Three sets of scenarios were run with different levels of REDD funding. In the USD 5 billion per year scenario, the overall emission reductions quickly drops as the RLs are reduced (more and more countries drop out). In both the USD 10 and USD 20 billion scenario reductions increase until the global scaling is 50 percent.

Some general conclusions emerge from this analysis. First, there are some gains, although relatively modest, from the use of a global additionality factor, which is set lower than 100 percent. The magnitude of this effect hinges, however, on the shape of the country-specific supply curves in the model. Second, the gains for using such a scaling factor increases with higher volumes of REDD funding. Higher volumes increase the carbon price and make participation attractive, even after reductions in RLs.

Figure A3.2: Implications of different scaling factors (global RL as percent of global historical deforestation)

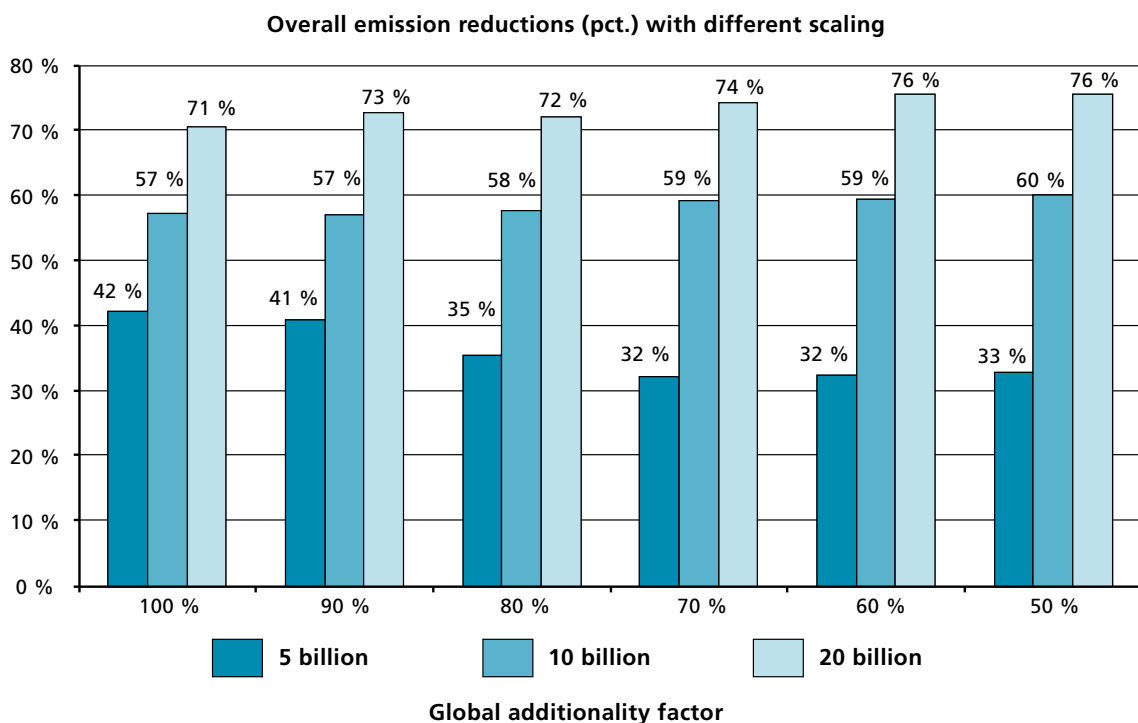
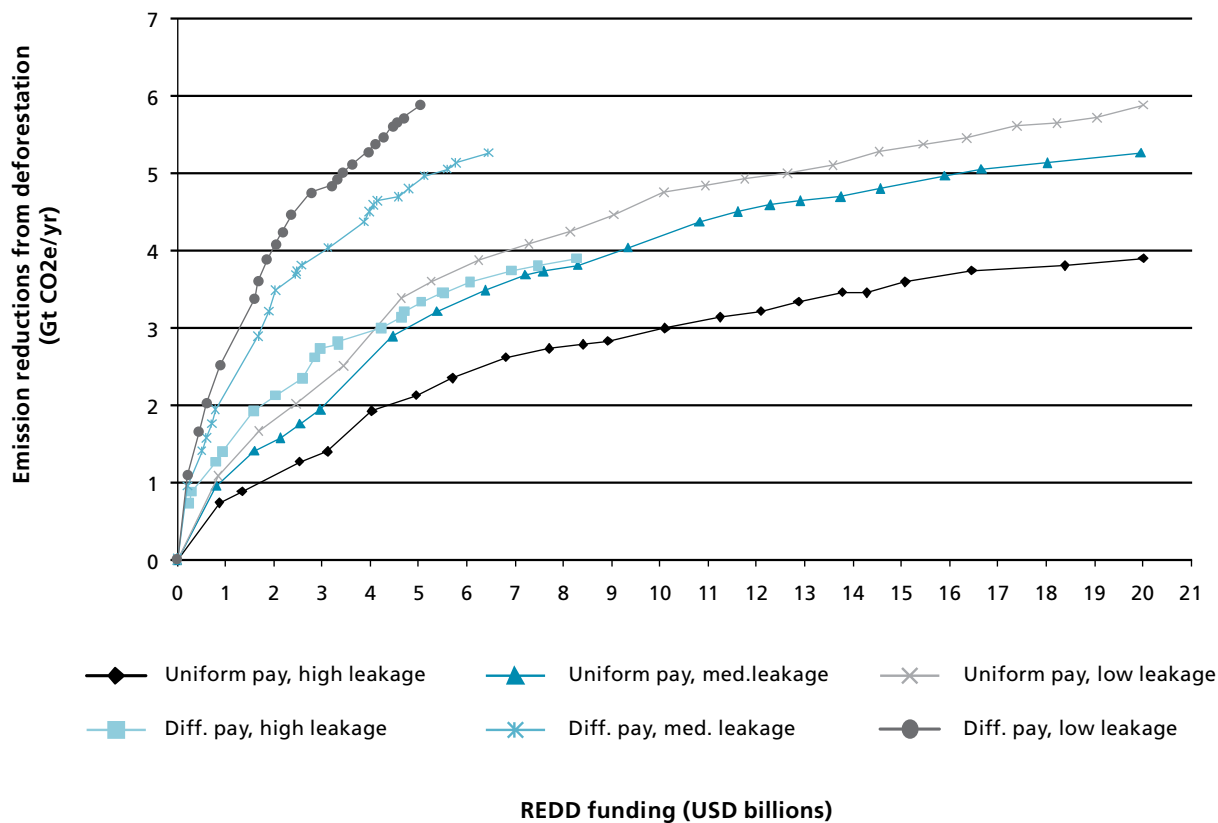


Figure A3.3: The mitigation potential of REDD



Third, not including a global additionality factor might have high costs in terms of lower global emissions reductions. In option 4 in the previous section, where forest cover and GDP/capita are added on top of national historical deforestation, *not* using the global additionality factor implies setting the global RL to 130 percent of global BAU. This would reduce the overall emission reductions achieved from 39 percent to 29 percent, underscoring the loss in overall effectiveness by setting generous RLs.

3.5.3 Implications of different magnitudes of funding and different payments

How large can emission reductions from REDD be in the future? The answer depends entirely on a large number of assumptions made. One critical variable is the amount of international funding available for REDD (through global funds, compliance markets, or other mechanisms). Another critical factor is the degree of international leakage, i.e., how reduced deforestation in

one country might lead to increased emission in other (nonparticipating) countries. In OSIRIS, the potential for international leakage is reflected in the assumption made of the global agricultural demand elasticity (ϵ).

Figure A3.3 illustrates the increasing emission reductions for REDD funding up to USD 20 billion per year (uniform payment, cf. next section). The analysis yields two important insights.

First, even modest amounts of funding can achieve significant emission reductions. For example, USD 5 billion per year can yield reductions in the range of 29 to 47 percent, depending on the assumed degree of international leakage.

Second, while the initial reductions are relatively cheap, further reductions will come at increasingly higher costs as more profitable land uses have to be compensated for. While the first USD 5 billion generates 42 percent reductions in the midrange scenario, the last USD 5 billion (from 15 to 20) generate only 6 percent reductions.

3.5.4 Implications of differentiated payment

Finally, the implications of a system where payment is differentiated by the actual costs of REDD in each country is assessed. The analysis so far has assumed a uniform payment system where all countries are paid the same price for per tCO₂e reductions. The implications of a system with uniform and differentiated REDD payment is illustrated in Figure A3.3, with different assumptions on the degree of international leakage.

The REDD rent (or net gain to REDD countries) varies between USD 3.1 and USD 3.8 billion in the four options assessed in section 3.2, cf. Table A3.3. In other words, of the USD 5 billion in REDD transfers assumed in each of the options, only between 24 and 37 percent is to cover actual REDD costs. This suggests a large cost savings potential in a system of differentiated payment.¹⁸ Alternatively, if the USD 5 billion were used to only cover the costs of emissions reductions, the realized emissions reduction would increase substantially. In option 1 above, the net emissions reductions might increase from 42 to 65 percent, compared to a situation without REDD.¹⁹

The issue of differentiated payment points to an inherent tradeoff in the allocation of REDD funds, and raises fundamental questions about the distribution of the REDD rent. It also raises questions about the implementation of such a system. It requires precise information on the costs of REDD, and recipients would have incentives to over-report costs. A system with differentiated pay might be an option in Phase 2 (cf. Chapter 2), when REDD finance is fund based, although it would add complexity. It would be less feasible in a Phase 3 market-based funding system, where certified emissions reductions would be sold at the same price, irrespective of the costs of production.

¹⁸ As a rule of thumb, in a system with uniform pay, approximately one-third of the transfer is to cover actual REDD costs, while two-thirds of the transfer is REDD rent. This share to cover actual costs can be increased by setting the global additional factor below 100 percent.

¹⁹ The increase in emissions reductions might be smaller than suggested above, but this is because marginal costs of REDD are increasing, as is international leakage.

Annex 4: Options for Monitoring, Reporting, and Verification

4.1 Additional issues

4.1.1 Plantations

Plantations are generally established for two purposes: production of timber or pulp, or for restoration of degraded lands.²⁰ Most concern regarding plantations is directed at industrial or production plantations.

1. One concern is that conversion of native forests, mature or secondary, to a plantation, will somehow result in carbon credits, but it is impossible for this to happen if a well-designed MRV system is in place. Reducing emissions from deforestation means that such conversion will be incentivized not to take place to maximize revenue from sale of C credits. The monitoring system will be able to show that a deforestation event occurred—conversion of forest to non-forest is clearly recognizable in remote sensing imagery and thus this will show as an emission that will have to be included in the national emissions. The monitoring system will also be able to determine if a plantation is established on the converted land (plantations are readily recognizable from remote sensing imagery because of their uniform canopy and shape of the plantation along with infrastructure such as roads)—but this will not lead to carbon credits either even under the enhancement of C stock activities as the emissions from the deforestation event will likely exceed sequestration for the life of the plantation and current Clean Development Mechanism (CDM) standards would not allow such an event to be a C credit.
2. Another concern is that if plantations are included in the forest definition, then preventing their harvest will constitute a reduction in deforestation and will then be eligible for credits. Production plantations are established for economic reasons because they supply fiber and timber; thus, it is highly unlikely that they would be protected from harvest for the potential sale of carbon credits. It is possible that an industrial plantation is abandoned because it is deemed unproductive, but if left unmanaged its structure and diversity will likely increase and it seems reasonable that it becomes part of a country's forest estate.

²⁰ The FAO-FRA refers to these as productive plantations or protective plantations.

3. For activities that enhance carbon stocks on non-forest lands, plantations are already eligible under the CDM, subject to stringent additionality and other tests. These tests could be required for REDD activities under this category.

4.1.2 Approaches and tiers

4.1.2.1 Description of approaches for activity data (AD)

The IPCC Guidelines describe three different approaches for representing the activity data, or the change in area of different land categories.

- Approach 1 identifies the total area for each land category—typically from non-spatial country statistics—but does not provide information on the nature and area of conversions between land uses; i.e., it only provides “net” area changes (i.e., deforestation minus afforestation).
- Approach 2 involves tracking of land conversions between categories, resulting in a non-spatially explicit land-use conversion matrix.
- Approach 3 extends Approach 2 by using spatially explicit land conversion information, derived from sampling or wall-to-wall mapping techniques. Under a REDD mechanism, land cover/land use changes will need to be identifiable and traceable in the future. Thus, Approach 3 is the only one that will meet this goal.

4.1.2.2 Description of tiers for emission factors

The emission factors are derived from assessments of the changes in carbon stocks in the various carbon pools of a forest. The Intergovernmental Panel on Climate Change (IPCC) recognizes five forest pools where carbon is stored: aboveground biomass, belowground biomass, litter, dead wood, and soil organic carbon. Carbon stock information can be obtained at different tier levels representing increasing levels of data requirements and analytical complexity. Moving from Tier 1 to Tier 3 increases the accuracy and precision of the greenhouse gas (GHG) estimates, but also increases the complexity and the costs of monitoring.

Table A4.1: IPCC guidelines on data and analytical needs for Tiers 1, 2, and 3

Soil carbon pool	Tier 1	Tier 2	Tier 3
Organic carbon in mineral soil	Default reference C stocks and stock change factors from IPCC	Country-specific data on reference C stocks and stock change factors	Validated model or direct measures of stock change through monitoring networks
Organic carbon in organic soil	Default emission factor from IPCC	Country-specific data on emission factors	Validated model or direct measures of stock change

The three Tiers are²¹:

- Tier 1 uses IPCC default values obtained from the IPCC Emission Factor Data Base (EFDB²²), (i.e., biomass in different forest ecoregions [see Annex 3.2 for examples], carbon fraction, etc.). Tier 1 estimates provide limited resolution of how forest biomass varies subnationally and have a large error range (~ +/- 70 percent or more of the mean) for aboveground biomass in developing countries. Tier 1 also uses simplified assumptions to calculate emissions. For deforestation, Tier 1 uses the simplified assumption of instantaneous emissions from woody vegetation, litter, and dead wood.
- Tier 2 employs static forest biomass information, but it improves on Tier 1 by using country-specific data (i.e., collected within the national boundary), and by resolving forest biomass at finer scales through the delineation of more detailed strata. Also, Tier 2 can modify the Tier 1 assumption that carbon stocks in woody vegetation, litter, and deadwood are immediately emitted following deforestation (i.e., that stocks after conversion are zero), and instead develop disturbance matrices that model retention, transfers (e.g., from woody biomass to dead wood/litter), and releases (e.g., through decomposition and burning) among pools. Done well, a Tier 2 approach can yield significant improvements over Tier 1 in reducing uncertainty, although not as precise as Tier 3 method.
- Tier 3 is the most rigorous approach associated with the highest level of effort. Tier 3 uses actual inventories with repeated measures of permanent plots to directly measure changes in forest biomass and/or uses well-parameterized models in combination with plot data. Tier 3 often focuses on measurements of trees only, and uses region-/forest-specific default

data and modeling for the other pools. Tier 3 does not assume immediate emissions from deforestation; instead, it models transfers and releases among pools that more accurately reflect how emissions are realized over time. The Tier 3 approach requires long-term commitments of resources and personnel, generally involving the establishment of a permanent organization to house the program.

To increase accuracy and reduce uncertainties of emission reductions and removals, it is important to have national-scale information on forest carbon stocks. Existing national forest inventories, however, are not designed to serve this purpose, as they do not necessarily stratify the sample design by threat and C stocks. Furthermore, national forest inventories generally use a sampling design that distributes the sample points evenly and systematically across the whole country, and resulting sample points in the forests being deforested and degraded are generally insufficient to obtain accurate estimates of carbon stocks with low uncertainty.

4.1.3 Soils

The IPCC provides guidelines on data and analytical needs for the different tiers for soil carbon changes in deforested areas, as shown in Table A4.1. For estimating emissions from organic carbon in mineral soils (most soils), the IPCC recommends the stock change approach, but for organic carbon in organic soils such as peats (e.g., tropical peat swamp forests), an emission factor approach is recommended. For organic carbon in mineral soil, changes in carbon stocks are estimated by applying stock change factors (specific to land use, management practices, and inputs [e.g., soil amendment, irrigation, etc.]) equal to the carbon stock in the altered condition as a proportion of the initial or reference carbon stock.

²¹ Pearson et al. 2008.

²² <http://www.ipcc-nggip.iges.or.jp/EFDB/main.php>.

Tier 1 assumes that a change to a new equilibrium stock occurs at a constant rate over a 20-year time period. Tiers 2 and 3 may vary these assumptions, in terms of the length of time over which change takes place, and in terms of how annual rates vary within that period. Tier 1 assumes that the maximum depth beyond which change in soil carbon stocks should not occur is 30 centimeters; Tiers 2 and 3 may change this threshold to a greater depth. Modifying Tier 1 assumptions and replacing default reference stock and stock change estimates with country-specific values through Tier 2 methods is recommended to reduce uncertainty for significant sources. Tier 2 provides the option of using a combination of country-specific data and IPCC default values that allows a country to more efficiently allocate its limited resources in the development of emission inventories. Further guidance on how to estimate emissions and removals from the soil carbon pool can be found in Pearson et al. (2008).

Variability in soil carbon stocks can be large; Tier 1 reference stock estimates have associated uncertainty of up to +/- 90 percent. Therefore, it is clear that if soil is a key category, Tier 1 estimates should be avoided. Because of the risk of high uncertainty using Tier 1, and the extra steps and corresponding capacity and costs needed to include changes in the soils carbon pool, it makes sense to include this pool only if relatively large emissions are expected, as when forests are converted to another land use. This situation occurs when forests on mineral soils with high soil carbon content are converted

to annual croplands or when other lands with highly degraded soils are converted to forests. The scientific body of evidence shows that there is no change in the soil carbon pool of mineral soils for forests remaining forests.

Selective logging practices in forests growing on highly organic carbon soils, such as the peat-swamp forests of Southeast Asia, can result in large emissions caused by practices such as draining to remove the logs from the forest. Extensive areas of peat swamp forests are found throughout Southeast Asia. Under natural conditions, the water table depth is near the peat surface and dead organic matter accumulates under these waterlogged conditions. Many of these peat forests have been destroyed due to degradation from legal and illegal logging, deforestation for conversion to oil palm and short-rotation pulpwood plantations, and burning from past land use change. In addition to the aboveground emissions that result from clearing the forest vegetation, emissions from peat continue through time because drainage causes a lowering of the water table, causing a release of CO₂ into the atmosphere from peat oxidation. If the water table is lowered by of 0.8 meters by draining, CO₂ emissions are estimated at 73 tons per hectare per year.²³ As the peat drains, it dries out and becomes more susceptible to burning. In the well-publicized 1997 fires in Indonesia, the average depth of peat burned in Central Kalimantan was 0.5 meters, resulting in a release of approximately 929 t CO₂/ha (253 t C/ha).²⁴

²³ Hooijer et al. 2006.

²⁴ Page et al. 2002.

Table A4.2: Aboveground biomass stock in naturally regenerated forests by broad category (tons dry matter/ha)

	Wet	Moist with short dry season	Moist with long dry season	Dry	Montane moist	Montane dry
Africa	310 -42 to +165 %	260 -61 to +167 %	123 -98 to +106 %	72 -22 to +271 %	191 n/a	40 n/a
Asia and Oceania:						
Continental	275 -45 to +248 %	182 -5 to +309 %	127 -79 to +122 %	60 n/a	222 -36 to +140 %	50 n/a
Insular	348 -80 to +149 %	290 n/a	160 n/a	70 n/a	362 -91 to +140 %	50 n/a
America	347 -34 to +248 %	217 -98 to +128 %	212 -95 to +192 %	78 -58 to +115 %	234 -21 to +149 %	60 n/a
Note: Data given are the mean value and a range of possible values expressed as a +/- percent of the mean. Source: IPCC 2003 GPG-Table 3A.1.2.						

4.2 Examples of Tier 1 data for aboveground biomass stocks and regrowth of tropical forests

Tier 1 estimates are provided in the IPCC GPG report in Chapter 3. Examples of data for tropical forests for aboveground biomass and average annual biomass increment for each tropical region by six ecoregional zones that are based on rainfall and seasonality and lowland or montane are shown in Tables A4.2 and A4.3. The tables present reported average estimates of aboveground biomass and annual biomass increment in naturally regenerated, mature forests, along with the lower and upper bound of the range expressed as a percent of the average value. For instance, for Africa, the range of aboveground biomass estimates in the wet zone is 130 to 511 t/ha, with an average value of 310.

4.3 Activities under forest remaining as forest

4.3.1 Activities that lead to forest degradation

The type of activities that lead to degradation, the likely magnitude of their climate benefit if activity was stopped or reduced (approximate percent of benefit relative to stopping deforestation), and availability of methodologies and data to monitor are presented in Table A4.4. Estimates of the climate benefit are based on a combination of field measurements and expert opinion²⁵; description of methods and data available for emissions factor from IPCC GPG report; and ability to monitor area deforested based on Annex 4.4.

²⁵ Pearson et al. 2008.

Table A4.3: Average annual increment in aboveground biomass in natural regeneration, by broad category (tons dry matter/ha yr)

Age Class	Wet	Moist with short dry season	Moist with long dry season	Dry	Montane moist	Montane dry
Africa						
≤20 years	10.0	5.3	2.4 -96 to 104%	1.2 - 67 to + 125%	5.0	2.0 -50 to 150%
>20 years	3.1 -74 to +123 %	1.3 na	1.8 -33 to +167%	0.9 -22 to 178%	1.0	1.5 -33 to 306%
Asia and Oceania Continental						
≤20 years	7.0 -43 to 157%	9.	6.0	5.0	5.0	1.0
>20 years	2.2 -59 to +136 %	2.0	1.5	1.3 -77 to +169 %	1.0	0.5
Insular						
≤20 years	13.0	11.0	7.0	2.0	12.0	3.0
>20 years	3.4	3.0	2.0	1.0	3.0	1.0
America						
≤20 years	10.0	7.0	4.0	4.0	5.0	1.8
>20 years	1.9 -62 to 137%	2.0	1.0	1.0	1.4 71 to +143%	0.4
<p>Note: R = annual rainfall in mm/yr. Data given are the mean value and a range of possible values expressed as +/- percent of the mean. Source: IPCC 2003 GPG-Table 3A.1.5.</p>						

Table A4.4: Degradation activities and associated climate benefits and methodological issues

Degradation activity	Climate benefit per hectare based on stopping activity (% compared to stopping deforestation)	Methods and data available for emission factors	Ability to monitor activity data with current suite of satellite sensors and proven methods
Sustainable timber management	Less than 10%.	No Tier 1 data for C stocks. Tier 1 data for growth and log extraction removals. IPCC methods do not include loss of C due to infrastructure.	Forest canopy damage marginally detected. Logging infrastructure (i.e., roads and log landings) are visible and may be used as a proxy to estimate forest area degraded.
Non-sustainable forest logging or conventional unplanned logging	Non-sustainable to sustainable logging—depends on reduction in timber extraction rate—< 5% Stop activity—< 12–15%.	No Tier 1 data for C stocks. Tier 1 data for growth and biomass removals. IPCC methods do not include loss of C due to infrastructure.	Not directly detectable. Forest canopy damage and logging infrastructure easily detected up to 2 years since disturbance.
Non-mechanized traditional logging	About <5%.	No Tier 1 data for C stocks, growth, or biomass removal	Not directly detectable
Illegal logging	Wide range—from < 5% where extraction rate is low, to up to 10% where extraction is high.	No Tier 1 data for C stocks, growth, or biomass removal	Not directly detectable; obscure and maybe detected indirectly.
Biomass extraction for fuel (fuelwood and charcoal) at rates greater than regrowth	About <5–8%.	No Tier 1 data for C stocks. Tier 1 data for growth and biomass removal.	Not directly detectable; obscure and maybe detected indirectly.
Shortening crop-fallow cycle of existing shifting cultivation lands	Up to 40–50% depending on current forest/fallow length.	Tier 1 data on regrowth of secondary forests could be used.	Not directly detectable; requires robust time series of remotely sensed data.
Forest fragmentation or forest encroachment	Up to 30–40%.	Tier 1 data for C stocks.	Isolated forest patches > 3 ha easily detected.

Table A4.5: Carbon stock enhancement activities and associated climate benefits and methodological issues

Activity to enhance C stocks of forests	Climate benefit per hectare (% compared to stopping deforestation)	Methods and data available for EF	Ability to monitor AD with current suite of satellite sensors and proven methods
Forest restoration and afforestation over about 10-year period	Up to about 30–40% depending on local site characteristics	Tier 1 data on growth of secondary forests or forest plantations could be used	Detectable up to about 15 years of age (after which cannot distinguish from mature forests)
Enrichment planting over about 10-year period	Less than about 5–8%	No Tier 1 data	Not detectable
Lengthening forest fallow cycle in slash-and-burn cropping	Up to 40–50% depending on current forest/fallow length	Tier 1 data on regrowth of secondary forests could be used	Not directly detectable, requires robust time series of remotely sensed data

4.3.2 Activities that lead to enhancement of C stocks

The type of activities that lead to enhancement of C stocks, their likely magnitude of enhanced removals (approximate percent relative to stopping deforestation), and availability of methodologies and data to monitor are presented in Table A4.5. Estimates of the climate benefit are based on a combination of field measurements,²⁶ data from IPCC GPG report, and expert opinion; description of methods and data available for EF from IPCC GPG report; and ability to monitor AD based on Carlos Souza (2009).²⁷

4.4 Remote sensing capabilities to detect undisturbed forest and various forest degradation classes and deforestation, secondary growth, and natural disturbances with Landsat-type sensors

Table A4.6 presents a description of the remote sensing capability to detect undisturbed forest and various forest degradation classes with Landsat-type sensors based on ongoing work by Carlos Souza of Imazon (Brazil). Table A4.7 describes the capability to detect deforestation, secondary growth, and natural disturbances with Landsat-type sensors (based on ongoing work and expert opinion of Carlos Souza Jr.). The information in Table A4.6 is based on field studies combined with image analysis in an area of Brazil's Amazonian forests.²⁸

4.5 Estimates of costs of monitoring at country scale

Funding for developing countries to measure and monitor their forests is an issue that must be addressed. All estimates point to the need for considerable resources for capacity building and technology transfer

²⁶ Pearson et al. 2008.

²⁷ Carlos Souza, Imazon, personal communication, 2009.

²⁸ Source: Souza Jr. et al. (work in progress, 2009). All trees with diameter at breast height (DBH) greater than 10 cm along a 10 m by 500 m transects for each forest class were mapped and measured. In addition, 10 sub-parcels (10 m x 10 m) were created every 50 meters along each transect. All trees were mapped within the sub-parcels and ground cover and canopy cover were estimated. Aboveground biomass was estimated using allometric equations available in the literature, adapted specifically for degraded forests where needed, and estimating vine biomass. The aboveground live biomass values are the mean with one standard deviation in parentheses.

to be invested in assisting developing countries over the coming years. In the early stages (Phase 2), funds will be needed to establish historical databases and build the expertise and infrastructure for routine data collection from field studies and satellite remote sensing. Recurring costs will include ongoing training, data collection from the field and from satellites, and integration into GIS systems for information delivery. In the long term, the recurring costs will have to come from national resources, derived from carbon-related financing (Phase 3).

A recent report by Hardcastle et al. (2008) provides estimates of the cost for monitoring for a wide range of developing countries. They estimate an average cost of about US\$1 million for up-front setup costs and US\$500,000 for annual costs, depending on the size of the country. Costs for specific countries are presented in Table A4.8. The authors of the report note that the report gives only a broad picture of each of the 25 countries considered. Moreover, the estimates do not represent the full cost of implementing forest monitoring systems, but the cost of bridging the gap between existing and required forest monitoring capacity.

Hardcastle et al. (2008) provide two estimates for the cost of monitoring emissions for deforestation under Tier 2 for the 25 countries in Table A4.9—Approach A and Approach B. These two approaches under Tier 2 are related to the process of stratification of forestlands that the GOFC-GOLD (2008) REDD Sourcebook recommended was needed to improve accuracy and precision of field measurements. The GOFC-GOLD REDD sourcebook describes two approaches for stratification, depending on whether a country has produced an accurate land-cover map or not:

Approach A uses the land cover map to identify different sampling strata and assumes that measurements of forest C stocks will be made in these strata. The C stock estimates are then used with change in land-cover maps over time.

Approach B suggests a stratification strategy to follow when no land-cover map is available. Activity data are assembled during a monitoring iteration, and then carbon measurements are made only in the locations where change has been identified. Nearby pixels with reflectance profiles similar to the target pixels before the change are inventoried to provide a reference carbon stocking level.

Table A4.6: Remote sensing capabilities for forest class detection

Forest Class (# transects)	Class description	Aboveground forest live biomass (ton/ha)	Detection by remote sensing
(1) Undisturbed Forest (n=15)	Consists of mature, undisturbed old growth forest dominated by shade-tolerant tree species.	376 (100.0)	Easily detected. Forest type differentiation is challenge.
(2) Non-mechanized logging (n=9)	Timber removal without the use of heavy vehicles such as skidders and trucks for various purposes such as wood consumption and fuel production. Gradual forest biomass loss occurs. Logging infrastructure (log landings, roads, and skid trails) is not built.	353 (66.5)	Not directly detectable.
(3) Managed Logging (n=14)	Planned selective logging where the tree inventory is conducted, followed by road and log landing planning to reduce collateral harvesting impacts.	343 (91.3)	Forest canopy damage marginally detected. Logging infrastructure (i.e., roads and log landings) are visible and may be used as a proxy to estimate forest area degraded.
(4) Conventional Logging (n=10)	Conventional unplanned selective logging using skidders and trucks. Log landings, roads, and skid trails are built causing extensive canopy damage and tree mortality. Low-intensity understory burning may occur, but forest canopy is not burned	335 (66.9)	Forest canopy damage and logging infrastructure easily detected up to 2 years since disturbance event.
(5) Forest Fragment (n=8)	Isolated forest patch created by deforestation with abrupt changes on edges to pasture and agriculture lands, or with transitional edges to secondary forests. Fragments in the study area usually subject to recurrent disturbances cause by logging and fires.	274 (77.2)	Isolated forest patches > 2 ha easily detected.
(6) Burned (n=6)	Any type of degraded forests heavily and/or recurrently burned causing extensive canopy damage and tree mortality.	261 (43.6)	Canopy forest scars easily detected up to 2 years since disturbance event.

Table A4.7: Landsat capabilities for forest class detection

Class	Class Description	Detection by Remote Sensing
(1) Shifting cultivation	Small forest clearings (1–10 ha) for agriculture purpose. It is abandoned and left to regrow in a rotation cycle of 5–15 years.	Forest clearings can be easily detected. Plantations and early-stage secondary growth resulting from this type of practice are more difficult to separate from green pasture. Robust imagery time series, with images acquired every 1 to 2 years over long periods, can improve detectability.
(2) Slash and burn	Cutting and burning of forest for small-scale farming. Forest clearing sizes vary in different regions.	Forest conversion by slash and burn >3 ha can be easily detected.
(3) Mechanized deforestation	Large scale (>50 ha) for monoculture agriculture.	Easily detected even with coarse spatial resolution sensors.
(4) Secondary forest	Regrowth of abandoned deforested areas.	Early-stage second growth (<5 years) marginally distinguished from green pasture and perennial crops; advanced state of regrowth (>15 years) marginally distinguishable from old growth forest. Requires robust imagery time series.
(5) Natural Disturbance	Changes in forest phenology associated with climate, water, and cycles or tree mortality caused by blow down and flooding events.	Natural damage to canopy marginally detectable and forest phenological changes potentially detected with robust image time series.
(6) Other Disturbances	Include harvesting of non-timber forest products, old logged or burned forest (i.e., >5 years), narrow sub-canopy roads, cryptic effects of climate change and surface under canopy fires.	Cryptic or obscure; may be detected indirectly.

Table A4.8: Estimates of cost to monitor emissions from deforestation and degradation for 25 countries at a Tier 2 and Tier 3 level in UK£

Country	Tier 2						Tier 3							
	Approach A		Approach B		Ignore degradation				Include degradation					
	1 st year		Recurring		Recurring		1 st year		recurring		1 st year		recurring	
	£000	£ ha ⁻¹	£000	£ ha ⁻¹	£000	£ ha ⁻¹	£000	£ ha ⁻¹	£000	£ ha ⁻¹	£000	£ ha ⁻¹	£000	£ ha ⁻¹
Bolivia	813	0.0138	114	0.0019	386	0.0066	813	0.0138	304	0.0052	906	0.0154	334	0.0057
Brazil	5,807	0.0122	306	0.0006	1,960	0.0041	5,807	0.0122	2016	0.0042	6,640	0.0139	2,286	0.0048
Colombia	1,051	0.0173	173	0.0028	537	0.0089	1,051	0.0173	401	0.0066	1,161	0.0191	437	0.0072
Costa Rica	491	0.2051	103	0.0433	347	0.1453	491	0.2051	167	0.0696	521	0.2177	177	0.0738
Guyana	767	0.0508	183	0.0121	625	0.0413	767	0.0508	247	0.0163	797	0.0528	257	0.0170
Mexico	251	0.0039	120	0.0019	251	0.0039	334	0.0052	203	0.0032	346	0.0054	215	0.0033
Peru	1,436	0.0209	247	0.0036	837	0.0122	1,436	0.0209	513	0.0075	1,565	0.0228	555	0.0081
Venezuela	1,147	0.0241	186	0.0039	720	0.0151	1,147	0.0241	376	0.0079	1,240	0.0260	406	0.0085
Cambodia	462	0.0442	75	0.0072	319	0.0305	462	0.0442	138	0.0132	492	0.0471	148	0.0142
China	0	0	0	0	0	0	0	0	0	0	0	0	0	0
India	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indonesia	1,500	0.0170	168	0.0019	645	0.0073	1,500	0.0170	548	0.0062	1,685	0.0190	608	0.0069
Malaysia	227	0.0109	0	0	56	0.0027	227	0.0109	76	0.0036	264	0.0126	88	0.0042
Myanmar	486	0.0151	99	0.0031	343	0.0106	486	0.0151	163	0.0051	516	0.0160	172	0.0053
PNG	897	0.0305	162	0.0055	640	0.0217	897	0.0305	276	0.0094	952	0.0323	294	0.0100
Thailand	767	0.0529	183	0.0126	625	0.0430	767	0.0529	247	0.0170	797	0.0549	257	0.0177
Viet Nam	629	0.0486	141	0.0109	582	0.0450	629	0.0486	204	0.0158	850	0.0657	214	0.0165
Cameroon	544	0.0256	150	0.0071	544	0.0256	580	0.0273	186	0.0088	632	0.0297	238	0.0112
Congo	385	0.0171	109	0.0049	313	0.0139	385	0.0171	205	0.0091	431	0.0192	219	0.0098
DR Congo	2,251	0.0169	325	0.0024	1,097	0.0082	2,251	0.0169	839	0.0063	2,501	0.0187	919	0.0069
Eq. Guinea	711	0.4362	128	0.0783	569	0.3485	712	0.4362	191	0.1169	742	0.4545	201	0.1230
Gabon	872	0.0401	193	0.0089	657	0.0302	873	0.0401	289	0.0132	917	0.0421	303	0.0139
Ghana	821	0.1488	127	0.0231	596	0.1081	821	0.1488	217	0.0394	851	0.1543	232	0.0421
Liberia	713	0.2263	130	0.0411	571	0.1809	714	0.2263	193	0.0611	744	0.2358	203	0.0642
S. Leone	713	0.2589	129	0.0468	570	0.2070	713	0.2589	192	0.0697	743	0.2698	202	0.0733

Source: Hardcastle et al. 2008.

Annex 5: Options to Promote Effective Participation of Indigenous Peoples and Local Communities

5.1 Terminology on indigenous peoples and local communities

International legal instruments use varying terminology²⁹ to address subnational groups within countries. For example, legal instruments refer to indigenous peoples; indigenous people, indigenous communities, indigenous populations, tribal peoples, minorities, forest dwellers, and local communities. The use of these terms is usually accompanied with a degree of controversy regarding their meaning. Notwithstanding the particular content of specific terminology, legal instruments often employ broad formulas, such as “indigenous peoples and local communities” or “indigenous and tribal peoples,” as an *inclusive* approach and to cover all relevant individuals and groups.

In the context of REDD, the distinction in terminology between “indigenous peoples” and “indigenous people” has been especially important.³⁰ The term “indigenous peoples” encompasses both individual and collective

²⁹ This section draws from Orellana 2009.

³⁰ Note that the UNFCCC does not mention indigenous peoples or local communities. The UNFCCC’s glossary does not include the terms “indigenous people,” “indigenous peoples,” “indigenous communities,” or “local communities.”

rights while the term “indigenous people” encompasses only individual rights. Historically, the use of the term “indigenous peoples” has been a concern to some Parties, as certain interpretations may lead to claims of secession that could result in political instability. In the particular context of REDD, the right to property, including with respect to land, territory, and natural resources, has a clear, collective dimension for indigenous and tribal peoples. Therefore, there is growing consensus that the term “indigenous peoples” is preferred over the singular “indigenous people,” given its ability to encompass both individual and collective rights.

Different international instruments use differing terminology, as illustrated in Table A5.1.

Given the difficulties associated with building a consensus on precise definitions, legal texts and international tribunals may use terminology that can encompass a broader array of subnational groups when attempting to provide for broad coverage. For example, the Inter-American Court of Human Rights declared that its jurisprudence regarding indigenous peoples’ right to property is also applicable to tribal peoples because both share similar characteristics, such as

Table A5.1: Terminology related to indigenous peoples

Terminology	Example of use
Indigenous peoples	ILO Convention 169 applies to “indigenous peoples in independent countries who are regarded as indigenous on account of their descent from the populations that inhabited the country, or a geographical region to which the country belonged, at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural, and political institutions.”*
Indigenous communities	UN Conference on Environment and Development: “indigenous people and their communities.” Appears to be an attempt to capture the individual and collective dimensions of the rights of IPs without addressing legal implications of the term “peoples” in international law.
Local communities	International Finance Corporation Performance Standards: “Community within the project’s area of influence.”**
Tribal peoples	ILO Convention 169 references tribal peoples as follows: “Tribal peoples in independent countries whose social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations.”*** The definition of “minorities” has raised and is still raising significant controversy.
Forest dwellers	Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests, uses the term “forest dwellers,” albeit without offering a definition.****

* International Labor Organization Convention No. 169, Article 1, available at <http://www.ilo.org/ilolex/cgi-lex/convde.pl?C169>.

** [http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/po_PerformanceStandards2006_glossary/\\$FILE/Glossary+of+Terms.pdf](http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/po_PerformanceStandards2006_glossary/$FILE/Glossary+of+Terms.pdf).

*** ILO Convention 169, Part I, Article 1, Paragraph 1(a), available at <http://www.ilo.org/ilolex/cgi-lex/convde.pl?C169>.

**** See articles 2(d) and 5(a).

having distinct social, cultural, and economic traditions different from other sections of the national community; identifying themselves with their ancestral territories; and regulating themselves, at least partially, by their own norms, customs, and traditions. In a similar vein, ILO Convention 169 refers to indigenous and tribal peoples, in order to encompass all groups that may exhibit the characteristics described therein. This “inclusive” approach turns the definitional issue into an inquiry over the elements that characterize the subnational group. Under this light, given the particular context of REDD, a formulation that would not exclude the rights of local communities or forest dwellers may be preferred to a more narrow definition.

5.2 Dedicated international appeals system

In the event that a REDD agreement authorizes Parties to approve subnational REDD programs in the context of national crediting, and provided that for such activities REDD units are issued at the international level, procedural rights could be based on the rights established under the Clean Development Mechanism (CDM) and Joint Implementation (JI) frameworks and expanded from the recent calls and proposals for the integration of due process rules under those mechanisms.³¹ Non-state actors involved either as project participants or as local stakeholders in a subnational REDD activity could thus be endowed with administrative and due process rights in relation to acts and decisions of international bodies. Indigenous peoples (IPs) and local communities (LCs) could feature as project participants in a REDD activity or as local stakeholders affected by REDD.

³¹ This section draws from Chagas 2009.

Subjecting subnational REDD activities to the direct approval of internationally constituted bodies, in a process analogous to the current (and future reformed) Kyoto project-based mechanisms, is a way of securing procedural rights to non-state stakeholders. Projects and initiatives validated, registered, and verified by independent entities accredited or constituted at the international level could provide for a more objective and transparent assessment of the merits and qualities of a certain undertaking.

Under this approach, non-state entities are bestowed with procedural rights that are protected directly at the international level. In this case, the design of a review mechanism for non-state entities seeking some level of redress under REDD could be modeled on other existing experiences in the international arena, such as the World Bank Inspection Panel (Box A5.1). The potential scope and mandate of such a mechanism are outlined in Table A5.2.

Lloyd and Hammer (2008) find that many of the existing multilateral banks are leading the way among multilateral institutions in terms of the use of such processes. However, there are also outstanding flaws that would need to be taken into account in the design of such mechanisms for REDD. These include:

- The independence of management of such systems;
- The maintenance of confidentiality of complainants;
- A potential inability to demonstrate rights have been violated, either through lack of voice or through non-recognition of rights in the process; and
- In the case of the World Bank Inspection Panel, it does not play a role in monitoring the implementation of the Board’s final decision on the remedial course of action.³²

³² Bradlow 2005.

Box A5.1: World Bank Inspection Panel

The Inspection Panel is a fact-finding body established by the World Bank in response to the widespread criticism generated by civil society and stakeholders with respect to the abidance by the Bank to its own policies in the support of infrastructure projects in developing countries. The Panel is charged with the mandate to hear complaints from non-state actors harmed or threatened to be harmed by the implementation of any such projects. Only those non-state actors whose interests have been affected by the Bank’s failure to follow its own policies are qualified to file complaints. The Panel is composed by three members and has specific rules designed to ensure its independency from the Bank’s Management. The Panel, however, does not have the power to issue binding rulings or to make recommendations.

Note: The World Bank Inspection Panel was adopted by the Bank’s Board of Executive Directors on September 22, 1993, through IBRD Resolution 93-10 and IDA Resolution 93-6. Also see the “About Us” section on the Inspection Panel website at www.worldbank.org/inspectionpanel.

Table A5.2: Scope and mandate of a review mechanism covering non-state entities protected at the international level

	Description
Mandate and scope	Affected participants would be given the right of recourse to the Convention appeal body and to seek appropriate remedies within the limits and powers of the body.
Powers	Fact-finding procedures and potentially on-site inspections. Decisions would be final and binding.
Structure	Clearly laid out terms of operation (likely in a COP decision) and a structure independent from political interests.
Qualifying non-state actors	Any non-state entity, both project participants and other stakeholders. They would need to prove that their rights had been infringed. Indigenous peoples and local communities could be granted “automatic” standing to submit complaints.
Admissible complaints	Alleged infringement of procedural rights, such as infringement of rights to information, to participation or an adequate timely response, or request for temporary interruption of the REDD project.

5.3 Protecting rights through instruments other than the UNFCCC

5.3.1 Cross-referencing between the UNFCCC and other international legal instruments

The participation of IPs and LCs in REDD can be included in the legal text for a REDD mechanism either directly through specific language that refers to IPs and LCs and their rights, or indirectly through the cross-referencing to other international legal instruments.

Cross-referencing can achieve several objectives, including:

- Amending an existing treaty;
- Defining the scope of the treaty; or
- Enhancing the authority to the treaty.

Cross-referencing between a Copenhagen agreement and other international instruments could help to strengthen the rights of IPs and LCs, although this would depend in part on where and how the cross-reference was made. Three main options exist:

1. Preamble: International instruments concerning the rights of communities and forest users could be cross-referenced in the preamble to the REDD legal instrument. For example, the preamble could refer to the two universal human rights covenants, (i.e., the International Covenant on Civil and

Political Rights³³) and the International Covenant on Economic, Social and Cultural Rights.³⁴ Reference to these broadly ratified treaties would anchor the vocabulary of the REDD legal instrument in widely accepted human rights norms. In addition, the preamble could refer to certain instruments elaborating on the particular rights of IPs, tribal peoples, and LCs, such as ILO Convention 169, the UN Declaration on the Rights of Indigenous Peoples, and/or the Convention on Biological Diversity.

- 2. Cross-references to definitional terms:** The challenges involved in threading coherence in international law can be illustrated by the potential difficulties associated with the definition of legal terms. Since a REDD instrument has the potential to affect the rights of IPs, tribal peoples, and other LCs, two basic options stand out in regard to definitional terms: (i) a REDD instrument could elaborate its own definitions; and (ii) a REDD instrument could include cross-references to definitions in other instruments. In regard to option two, a REDD instrument could rely on the already agreed definitions of IPs and tribal peoples in ILO Convention 169, which addresses that subject matter in detail. On the other hand, this definition may not be acceptable to UNFCCC

³³ International Covenant on Civil and Political Rights, G.A. res. 2200A (XXI), 21 U.N. GAOR Supp. (No. 16) at 52, U.N. Doc. A/6316 (1966), 999 U.N.T.S. 171, entered into force Mar. 23, 1976 available at <http://www1.umn.edu/humanrts/instr/b3ccpr.htm>.

³⁴ International Covenant on Economic, Social and Cultural Rights, available at: http://www.unhcr.ch/html/menu3/b/a_ceschr.htm.

Table A5.3: Options for cross-referencing between international human rights instruments and REDD

Option	Effect	Specific advantages/ disadvantages
Preamble	The preamble could refer to the two universal human rights covenants (i.e., the International Covenant on Civil and Political Rights,* and the International Covenant on Economic, Social and Cultural Rights**).	Would anchor the vocabulary of the REDD legal instrument in widely accepted human rights norms. But not legally binding.
Definition of terms	Could elaborate its own definitions	Advantage if definitions are not acceptable to UNFCCC Parties.
	Could include cross-references to definitions in other instruments, such as ILO Convention 169.	Includes detailed definitions and avoid revisiting debates.
Cross-referencing a legal obligation	A cross-reference to a whole instrument.	May be too broad as importing a whole instrument would encompass issues not directly related to REDD.
	A cross-reference to generally accepted norms. This option could address the particular concerns presented by a REDD instrument, while at the same time allowing for evolving normative developments.	Would suffer from a certain degree of indeterminacy because it is referencing norms rather than specific provisions.
	A cross-reference to particular provisions in specific instruments such as the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), which contains particular provisions on the right to land (articles 25–29) and on participatory rights (article 32).	Cross-referencing specific provisions could address the particular concerns that arise in connection with the potential impacts of REDD.

* International Covenant on Civil and Political Rights, G.A. res. 2200A (XXI), 21 U.N. GAOR Supp. (No. 16) at 52, U.N. Doc. A/6316 (1966), 999 U.N.T.S. 171, entered into force Mar. 23, 1976 available at: <http://www1.umn.edu/humanrts/instree/b3ccpr.htm>.

** International Covenant on Economic, Social and Cultural Rights, available at: http://www.unhcr.ch/html/menu3/b/a_ceschr.htm.

Parties, or to the IPs in independent countries. In such case, the elaboration of a tailored definition for the purposes of a REDD-instrument could be preferred.

3. **Cross-referencing legal obligations:** The determination of which particular legal norms could be imported into a REDD instrument requires careful consideration. Concerns to be addressed are likely to include the right to property and participatory rights. These could be incorporated via a cross-reference to a whole instrument; a cross-reference to generally accepted norms or a cross-reference to particular provisions in specific instruments (Table A5.3).

Finally, another option is to elaborate original language that reflects the main elements of provisions found in other instruments, without the need for importing the other instrument. This technique has the advantage of avoiding inconsistencies while allowing for tailored approaches. This technique does not involve direct cross-referencing.

5.3.2 International human rights instruments

• Granting of rights

Rights granted to non-state actors can be individual rights guaranteed to each person or collective rights guaranteed to a subnational group.³⁵ The main rights that might be applicable in REDD are property rights, rights to free prior informed consent, participatory rights, and the right to self-determination. A number of international human rights instruments are relevant for REDD (Box A5.2). The basic international human rights treaties are widely accepted, for example, the International Covenant on Economic, Social, and Cultural Rights, with 160 parties; and the International Covenant on Civil and Political Rights, with 164 parties. Other instruments have also received wide support; UNDRIP, for example, was adopted by the General Assembly with 143 nations supporting it. The Convention on Biological Diversity has 191 parties.

³⁵ This section draws from Orellana 2009.

Box A5.2: Illustrative international human rights instruments relevant to REDD

The International Covenant on Economic, Social, and Cultural Rights asserts that “In no case may a people be deprived of its own means of subsistence” (Article 1), suggesting an imperative that REDD not result in the denial of access to forest-based livelihoods.

The International Covenant on Civil and Political Rights (ICCPR) provides guidance to ensure that human rights violations—such as arbitrary arrest and detention (Article 9)—do not result from repressive law enforcement-orientated approaches to achieve REDD objectives.

The United Nations Declaration on the Rights of Indigenous Peoples proclaims that “States shall establish and implement, in conjunction with indigenous peoples concerned, a fair, independent, impartial, open and transparent process, giving due recognition to indigenous peoples’ laws, traditions, customs, and land tenure systems, to recognize and adjudicate the rights of indigenous peoples pertaining to their lands, territories, and resources (Article 27), a process that would need to precede REDD implementation.

The Convention on Elimination of All Forms of Discrimination against Women affirms that development plans must take into account “the particular problems faced by rural women and the significant roles which rural women play in the economic survival of their families, including their work in the non-monetized sectors of the economy” (Article 14), which is particularly significant in the case of forest resource use.

Source: Angelsen 2008.

• Enforcement of rights

There are a number of routes through which rights may be enforced. These include:

- 1. National enforcement**, in cases where rights are recognized within the jurisdiction in question, as well as available judicial recourse.³⁶ Enforcement of rights at the national level depends on the extent of recognition of those rights within the jurisdiction in question, and available judicial recourse. Certain international instruments, in addition to recognizing rights, also oblige the State to adequately give effect to those rights by taking whatever necessary internal measures. For example, the American Convention on Human Rights provides that, “Where the exercise of any of the rights or freedoms referred to in Article 1 is not already ensured by legislative or other provisions, the States Parties undertake to adopt, in accordance with their constitutional processes and the provisions of this Convention, such legislative or other measures as may be necessary to give effect to those rights or freedoms. Accordingly, States assume the obligation to structure their domestic legal systems in a way that ensures the effectiveness of the rights recognized in the American Convention.
- 2. International oversight mechanisms:** Several legal instruments establish mechanisms, including independent committees, to oversee the implementation of, and compliance with, the instrument in question. For example, the Committee on the Rights of the Child receives and examines reports from State parties regarding their implementation of the Convention on the Rights of the Child. Certain treaty bodies are also empowered to hear individual cases. For example, Protocol 1 to the International Covenant on Civil and Political Rights (ICCPR) allows the Human Rights Committee to receive individual applications. These international oversight mechanisms provide for a degree of enforcement of rights.
- 3. International courts and tribunals:** The regional basic human rights conventions in Africa, Europe, and the Americas establish standing courts to hear individual cases and issue binding judgments. The existence of human rights tribunals thus provides another forum to secure enforcement of rights, provided that rules of admissibility have been met. The decisions of the regional human rights courts have also exerted a significant influence on the shaping and progressive development of the law, in connection with the rights of indigenous and tribal peoples, as well as minorities.

³⁶ For example, the American Convention on Human Rights, UNDRIP, and ILO Convention 169.

Table A5.4: Types of rights protected in international instruments and examples of their use

Type of right	Description	Examples of international usage
Self-determination	The right to self-determination is the right to have a say in and influence one's own future. This right can be granted individually to persons or collectively to groups.	International Covenant on Civil and Political Rights; International Covenant on Economic, Social and Cultural Rights; UNDRIP.
Free, prior, informed consent	Allows persons and groups to participate in, and to object to, decisions that affect the person or group. FPIC has been articulated as a stand-alone right, as an element of consultations, and as a safeguard in permissible restrictions to the right to property.	UNDRIP; ILO Convention No. 169.
Right to land and territories	Human rights law recognizes the right to land and territories to indigenous and tribal peoples, as an element of the right to property.	UNDRIP; ILO Convention No. 169; International Convention on the Elimination of All Forms of Racial Discrimination.
Right to natural resources	Human rights law also recognizes the right to natural resources in indigenous and tribal peoples lands and territories that are essential to their survival, as an element of the right to property.	UNDRIP; ILO Convention No. 169; Convention on Biological Diversity.

5.3.3 Voluntary standards

- **Summary**

The development of voluntary standards may also help to enhance participation in REDD. Existing experience with forestry and carbon standards indicates that these could be effective in terms of recommending best practice procedures that should be followed in project design and in introducing third-party oversight into REDD systems.³⁷ However, they have limitations in a number of areas:

- They are voluntary, so there is no guarantee that they will be applied;
- They can have perverse effects, such as reducing access because of increased costs or technical expertise;
- They mainly exist for projects with defined boundaries. It is harder to envisage standards for national REDD systems, which raise questions over who has authority to conduct third-party oversight and appropriate methodologies for assessing broad social impacts.

³⁷ Peskett, Luttrell, and Iwata 2007.

Outside of the international Convention, incentives to ensure rights and increase participation of IPs and LCs in REDD programs can potentially be created through the use of voluntary standards. Lessons can be learned from the use of voluntary standards in carbon offset markets and sustainable forestry management systems to assess the effectiveness of such standards in securing the rights and participation of vulnerable communities.

- **Carbon offset standards**

Voluntary standards for carbon offsets have developed alongside the proliferation of carbon offset markets and are driven by multiple objectives. Some standards focus on the accurate accounting and reporting of carbon emissions while others focus on ensuring that projects deliver additional social co-benefits to project stakeholders.³⁸ The Climate, Community and

³⁸ There are a number of voluntary standards covering the carbon markets. These include the Gold Standard, the Climate, Community and Biodiversity Standards, the Voluntary Carbon Standard, VER+, Plan Vivo Standards, and Social Carbon.

Biodiversity Standards and the Gold Standard are of particular relevance to REDD and IPs and LCs because they focus specifically on the sustainable development aspects of projects. Similar standards could be applied voluntarily to REDD schemes developed under the UNFCCC.

• **How effective are voluntary standards in securing social co-benefits for IPs and LCs?**

It is useful to distinguish between different scales in terms of the effectiveness of voluntary standards for promoting participation of IPs and LCs.

At the project scale, some standards outline rigorous procedures for ensuring participation. The Gold and the Climate, Community and Biodiversity (CCB) standards, for example, have detailed social impact indicators covering a range of issues, including employment, local capacity, and legal status (Table A5.5). The CCB standard also considers off-site community impacts, ongoing community impact monitoring, and the use of best practices in community involvement. Both include mandatory third-party verification and a degree of ongoing monitoring. While there is still little experience in terms of the effect that these procedures may have, the basic formulation of the standards and comparisons with other standards (e.g., the Forest Stewardship Council), indicates that they are likely to have positive impacts in terms of participation.

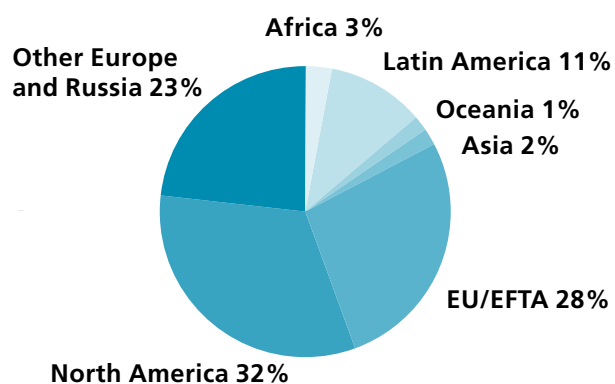
At larger scales, voluntary standards give a slightly different picture in terms of how they promote participation. Some of the key concerns include:

1. The proliferation of multiple types of standards can create confusion in the marketplace and a range of quality among different standards schemes. This is evident across the different carbon standards, where in some cases companies look to be applying their own standards, which do not meet usual best practice. This could result in a situation where companies are referencing standards in order to sell carbon products, but which have been secured through a rough checklist approach that is not fully implemented or adhered to in practice.

2. Lessons from voluntary standards for sustainable forest management demonstrate risks associated with applying a high threshold for project participation. For example, it has been argued that the Forest Stewardship Council (FSC) tends to certify forest areas that are already engaging in “good practice” activities, rather than to improve the poorest practices, which was the original rationale. As evidenced by Figure A5.1, there has been a low uptake of the voluntary FSC standards in developing countries, primarily because such countries are conventionally viewed as “high risk” in relation to forest management and the overall quality of governance, and due to weak or nonexistent tenure rights to land of IPs and LCs.³⁹ The same risks would likely apply to voluntary standards for REDD programs.
3. In establishing a voluntary RED program standard, there needs to be a balance between the stringency of the standards (which will be needed to ensure effectiveness) and equity—cost burdens and stringent criteria around land tenure may be unavoidable, but will create barriers to participation for many.

³⁹ Brown et al. 2008.

Figure A5.1: Regional distribution of certified forest area by FSC, 2006 (%)



Source: FSC website.

Table A5.5: A comparison of the main elements of five independent carbon offset standards

	Objective and development	Scope	Assessment process	How sustainable development is assessed
Gold VER Standard	<p>Sustainable development and environmental integrity.</p> <p>Multi-stakeholder NGO process.</p>	<p>Voluntary market: renewable energy and end-use energy efficiency improvement.</p>	<p>Projects scored according to sustainable development. High scores carry a premium. Third-party verification required and CDM accredited verifiers are recommended. Targeted random sampling and annual independent auditing of sample of projects.</p>	<p>Through indicators of: local/regional/global sustainability; social sustainability and development; environmental impact assessment. Two stakeholder consultations required.</p>
CCB Standard	<p>Minimize climate change, support sustainable development, and conserve biodiversity.</p> <p>Multi-stakeholder process involving NGOs and research institutes.</p>	<p>CDM: land-use, land-use change, and forestry projects (LULUCF). Also used as a benchmark for voluntary market projects.</p>	<p>Project documentation assessed against 15 essential and 8 optional indicators. Then ranked as “approved,” “silver,” or “gold.” Third-party verification required and CDM accredited verifiers are recommended.</p>	<p>Focuses on local/regional sustainability. Each indicator requires detailed assessment (through suggested methodologies) and documentation.</p>
Voluntary Carbon Standard	<p>Emission reductions.</p> <p>Multi-stakeholder process led by corporate actors. Has had two editions and consultations.</p>	<p>Voluntary market: energy efficiency projects; does not include LULUCF yet but under consideration.</p>	<p>Ten threshold criteria need to be met. GHG Protocol and ISO Standards used for audit processes, verification, and certification. It also sets out a 5-step process for unit registration similar to the CDM project cycle and establishes a registry for tracking units. Third-party verification required. Recommends same verifiers as CDM using audit practices described in ISO3000 and ISO/FDIS 14064-3.</p>	<p>Verification entity verifies that project is in compliance with all relevant local and national legislation; highlights negative impacts and verifies that the project itself is not increasing emissions.</p>
CDM Projects	<p>Emission reduction and contributing to sustainable development in developing countries.</p> <p>Developed through negotiations over the Kyoto Protocol.</p>	<p>CDM projects: renewable energy, energy efficiency, and LULUCF projects.</p>	<p>Not a standard in itself, but the 7-stage project cycle sets out standardized components for any projects that are approved by the CDM Executive Board. Requires two different third-party verifiers to validate and certify projects. For small-scale projects the same entity can be used for both steps.</p>	<p>Contribution to sustainable development assessed according to their host country indicators. The process may involve check lists, multi-criteria frameworks, and weighting and point scoring systems. A description of environmental impacts and documentation on stakeholder comments is required.</p>

Source: Adapted from Peskett et al. 2007.

Table A5.6: Key areas of support for an international REDD fund

Possible activities to be supported by a fund	
International level	Participation in international processes surrounding REDD (COP/CMP) Participation in REDD-related consultations run by donors (e.g., World Bank, UN-REDD, other donors). Legal costs and legal representation at international levels in the case that an international redress mechanism exists.
National level	Technical assistance, such as training national REDD focal point staff; development of legal institutions. Support to civil society organizations across all sectors. Finance for assisting with participation in MRV systems (e.g., training and other technical assistance).
Local level	Legal costs and legal representation in REDD processes in national courts. Information on REDD in multiple formats and languages. Up-front investment finance required for establishing projects/programs Training in monitoring processes/methodology application.

5.3.4 International civil society advisory board for REDD

It has been suggested that an international advisory board or similar body be established for REDD and/or climate change more generally, specifically to address issues surrounding rights of IPs and LCs.⁴⁰ Such institutions have been established in other international processes with some success,⁴¹ though they are less common under formal multilateral agreements.⁴² This is perhaps because these processes often include formal procedures for taking into account the interests of civil society, such as rights for “observer status,” rules of procedure, opportunities to address the COP and subsidiary bodies in plenary meetings, and opportunities to provide input to consultations.⁴³ Such a structure would therefore be most likely to develop as a voluntary effort independent of the UNFCCC process. In any case, careful attention would need to be paid to its composition and structure, relationship to the international process, and its mandate. Lessons from other processes indicate that success is contingent on factors such as maintaining independence,

⁴⁰ Examples include an International Alliance proposal (IIPFCC) at COP 13 for the creation of an Expert Group on Climate Change and Indigenous Peoples, and a proposal by the Rights and Resources Initiative to establish a Civil Society Advisory Group.

⁴¹ Khare 2008.

⁴² The CBD, for example, has a number of negotiating committees that include NGOs, with periodic secondment of an NGO representative to a multilateral agency to work on policy formulation and implementation (Jordan 2003).

⁴³ In the UNFCCC, Article 7.6 established the mandate for the admission of NGOs as observers. The COP rules of procedure (Rule 7.2) further elaborate the procedures surrounding observers’ rights.

transparency, inclusiveness, avoiding “capture” by particular constituencies, and ensuring the structures do not undermine existing democratic processes.⁴⁴

5.3.5 Establishment of an international fund to support participation in REDD

One of the overarching options for enhancing participation at international, national, and local levels will be the availability of financial resources specifically aimed at supporting IPs and LCs. A fund could be created under the UNFCCC, as has been done for other international instruments.⁴⁵ It would likely rely on voluntary contributions from Parties, but it may be possible to resource it by earmarking revenues from carbon trading schemes. It will be important to ensure that it is adequately stocked, easily accessible, and structured in a way that allows ownership while maintaining independence.

A key principle for funding would be ensuring adequate support for in-country civil society and NGO capacity building, both within and beyond the sector (Table A5.6). Another key area is likely to be in strengthening national REDD focal points.⁴⁶ Still, there is no guarantee that such assistance would strengthen the attention to socially sustainable development criteria, which would probably remain in the sovereign domain.

⁴⁴ Things may become more problematic when international civil society is engaged in monitoring and evaluation, which could impinge on national sovereignty (Wigell 2008; Dubash et al. 2002; Luttrell 2008).

⁴⁵ FIELD 2008.

⁴⁶ REDD focal points have been widely proposed, for example: “Forum on Readiness for REDD,” Accra, Ghana 19-20 August, 2008. Available at: www.whrc.org/Policy/REDD/Reports/FinalMtgSumm-Ghana.pdf.

5.4 MRV systems and linkages to participation

With respect to the establishment of REDD methodologies, there are three potentially promising areas for enhancing participation and ensuring the rights of IPs and LC. First, one way to avoid wrongfully targeting traditional practices is to include IPs and LCs in the process of establishing REDD methodologies and strategies, and in overall policy formulation and implementation. Second, participation can be enhanced through the use of locally based participatory monitoring methods. The former refers to participation in the *creation* of the methodologies; the latter refers to participation in the ongoing *implementation* of the methodologies.

Third, and in addition to inclusion of IPs and LCs as actors in the forest MRV, there is also the importance of including an MRV mechanism in the methodologies in which the IPs and LCs are the focus. Currently, submissions on methodological issues of REDD are being submitted to the UNFCCC process. The Climate Action Network (CAN) has made a submission to the UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA) on the methodological issues of REDD recommending the integration of monitoring and reporting of the social impacts of REDD on IPs and LCs.⁴⁷ This is to ensure full and effective participation by IPs and LCs in all stages of decision making.

While all three options for enhancing participation and ensuring the rights of IPs and LCs are critically important, this section focuses on the second option, including local communities in the ongoing forest MRV, and provides evidence that inclusion in such processes can be beneficial. Although there are likely to be few direct entry points through the international MRV development process for incentivizing specific application of approaches at the local level, the methodological development process is an important entry point for this topic.

⁴⁷ CAN states:

- a. Parties must be able to demonstrate, where relevant, the involvement of and impact on indigenous peoples and local communities in their national implementation of REDD methodologies.
- b. A conflict resolution mechanism must be incorporated within the overall REDD framework to address any conflicts that might arise between governments, communities and other stakeholders.
- c. The application by Parties of REDD methodologies, including those that protect the rights and interests of forest-dependent peoples, must be reviewed and monitored through transparent processes by independent third parties.

Most efforts to establish monitoring protocols have focused on “externally driven” approaches that rely on external expertise for their establishment and implementation. Decisions may therefore be biased toward the interests of professional forest managers, rather than those of local communities. Locally based and participatory approaches could be further developed, for example, to supplement remote sensing options. The International Forum of Indigenous Peoples on Climate Change (IIPFCC) recommends that IPs should be “empowered with the ability to conduct monitoring and enforcement of forest lands” (IIPFCC SBSTA submission 2009).

There is some evidence that such participatory MRV systems are cost-effective. Costs vary with the intensity of data collection, accessibility of the area, density of forest management staff at the field level, and the type of participatory approach used. One study found that costs averaged USD 0.08/ha/yr across 15 study sites. Such approaches should be carefully considered in the development of REDD programs. There is also evidence that field-monitoring techniques for conservation management that used the most participatory methods generated more interventions aimed at ensuring a continued resource supply for local communities.⁴⁸ Locally based monitoring schemes often reinforce existing community-based resource management systems.

However, community forestry literature suggests that communities are still quite constrained in their capacity to design and manage such operations. Empirical evidence from community forestry in Cameroon demonstrates that a clear asymmetry exists between community capacity and the provisions set out for CDM implementation within community forests.⁴⁹ This is because low-income communities lack the financial, technical, and human resources required to fulfill additionality requirements, and impact prediction, validation, and verification. As such, any MRV system that includes participatory methods for local communities must be accompanied by the appropriate legal framework, just compensation, and technology transfer to ensure due and effective monitoring.

⁴⁸ Danielsen et al. 2005.

⁴⁹ Minang, McCall, and Bressers 2007:615-630.

About Meridian Institute

The Meridian Institute is a not-for-profit organization whose mission is to help people solve problems, make informed decisions, and find solutions to some of society's most complex and controversial problems. Meridian's mission is accomplished through applying collaborative problem-solving approaches including facilitation, mediation, and other strategic consultation services. Meridian works at the local, national, and international levels and focuses on a wide range of issues related to natural resources and environment, science and technology, agriculture and food security, sustainability, global stability, and health. For more information, please visit <http://www.merid.org>.

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Reducing Emissions from Deforestation and Forest Degradation (REDD): An Options Assessment Report

Prepared for
The Government of Norway

Climate change mitigation will be neither cheap nor easy. But the costs and complexities of the mitigation challenge pale in comparison with the risks and costs that are likely to accompany failure to take decisive action. Because deforestation accounts for about 18 percent of global greenhouse gas emissions—larger than the entire global transportation sector—reducing emissions from deforestation and forest degradation (REDD) must be part of the Copenhagen agreement of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC). Without REDD, the widely endorsed goal of climate stabilization at a maximum 2°C temperature increase will not be reached.

To capture the mitigation potential of the forest sector, this Options Assessment Report suggests a flexible, three-phase approach to policy measures and positive incentives in order to accommodate (i) the diverse capabilities and circumstances of REDD countries; (ii) an expanded scope of REDD to include conservation, sustainable management of forests, and enhancement of forest carbon stocks; and (iii) the near-term constraints of the current global financial crisis.

Phase 1, already initiated in many countries, includes the development of national REDD strategies, encompassing national dialogue, institutional strengthening, and demonstration activities. Phase 2 involves a fund-based approach to support the implementation of the policies and measures proposed in those national REDD strategies, administered on the basis of pre-agreed performance measures. To make substantial progress toward a 2020 goal of halving global deforestation, Phase 2, starting in 2010, should include internationally binding financial commitments from industrialized countries at a suggested level of USD 2 billion per year, increasing to USD 10 billion per year in 2014. Phase 3 would bring in elements of a future regime with a compliance instrument based on quantified greenhouse gas emission reductions and removal enhancements.

The transition from Phase 2 to Phase 3 requires attention to the setting of reference levels and the monitoring, reporting, and verification (MRV) of emissions and removals. National historic deforestation is the best near-term predictor of deforestation and could be used as a point of departure for reference level setting, but diverse national circumstances argue for consideration of additional variables, including forest cover and income level. Reference level setting should also (i) reflect adherence to a principle of reducing forest sector emissions globally, and (ii) follow a process that is compatible with future incorporation into a broader agriculture, forests, and other land uses (AFOLU) sectoral reporting framework. MRV should also follow relevant UNFCCC precedents and Intergovernmental Panel on Climate Change (IPCC) methodologies.

Furthermore, REDD policies and their implementation should promote the effective participation of indigenous peoples and local communities both internationally and nationally. This report examines a range of approaches both within and outside of the UNFCCC process, including procedural mechanisms, careful design of financial and MRV systems, and clarification of rights to land and natural resources.

A sustainable outcome for REDD will require a global partnership, with REDD country leadership needed for successful implementation, including participation of indigenous peoples and local communities, and industrialized country leadership provided through deep domestic emission reductions and support for REDD actions.